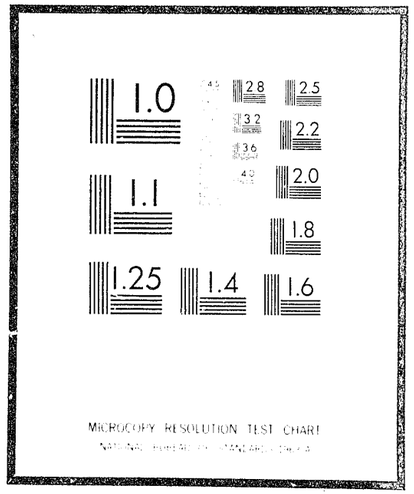

National Center for State Courts
NORTHEASTERN REGIONAL OFFICE
209 Bay State Road
Boston, Massachusetts 02215
(617) 247-2002

November 7, 1974

USER'S INTRODUCTORY HANDBOOK

NCSC Computerized Interactive Research System (CONRES)

The preparation of this document was funded by the Law Enforcement Assistance Administration through the Massachusetts Committe on Criminal Justice.

National Center for State Courts

MEMORANDUM

To: The Regional Directors November 7, 1974

From: Sam Conti

Enclosed is your personalized (See page 18) copy of "Users Introductory Handbook," which has been produced at the Northeastern Regional office by Chip Gatter, Jerry Kelly, and Bill Popp.

We hope it will be of use to you.

National Center for State Courts

MEMORANDUM

To: Regional Directors November 7, 1974

From: Jerry Kelly & Chip Gatter CG

Re: NCSC Interactive Research System

Enclosed please find a copy of the "User's Introductory Handbook" which explains the capabilities and the use of the NCSC Computerized Interactive Research System (CONRES). This memo describes the salient points of the system.

WHAT THE SYSTEM IS

CONRES is a computer system, which can be accessed by a terminal in your office. The system was designed to serve the special capabilities needed during the course of a Center study: collecting and organizing raw data and, at a later point, manipulating this data so that inferences can be made from it.

Using the research system is easy: the system explains itself every step of the way, having been designed to be used by people who have never even seen a computer before and who know nothing about programming.

WHAT MAJOR TASKS IT CAN PERFORM

Statistics

CONRES can calculate the mean of any category of numeric data, its standard deviation, and its frequency distribution. (Pages 15-18)

Time Lapse Calculation

It can compute the number of calendar days between any set of dates; leap years are automatically compensated for. (Pages 21-23)

Retrieval

You can retrieve information from a study's data file according to any set of criteria. For example, if you have a file composed of the names and salaries of all the personnel in a given court system, you may select out of the file, say, all the Petersons who make more than $10,000 but less than $15,000 and who work in a given area. (Pages 9-13)

Display

The entire contents of a data file can be displayed either (1) at the typewriter or, (2) via batch at the computer center. (Page 14)

Build a Report

Information can be displayed as you desire it rather than a fixed fashion. You choose the title, the heading and the format of the output reports. (Pages 18-20)

COSTS AND INSTALLATION

The cost of operating the system has two components: the rental of a terminal with an acoustic coupler (needed to connect your telephone to your typewriter) and computer time. If your regional office already has an IBM magnetic card selectric typewriter, you can use this typewriter as a terminal.

If you don't have an IBM magnetic card typewriter available, there is a wide selection of terminals commercially available at a cost of approximately $75-200 per month. An acoustic coupler (necessary) costs $20 per month. Terminal time costs vary according to type of computer. At Boston University, terminal time costs $6 per hour. Typical monthly costs for an office are listed below:

IBM Magnetic Card Selectric	(no additional cost)
Acoustic coupler	$ 20.
40 hours of terminal time	$ 240.
TOTAL MONTHLY COSTS	$ 260.00

Once you select an appropriate computing center and acquire your terminal, an individual who is acquainted with the research system would normally have the system running in a matter of hours. The technology used is not special. In fact, thousands of students use terminals on an every day basis.

WHO SHOULD I CONTACT FOR QUESTIONS?

The NCSC Interactive Research System is currently being tested by NERO; contact Mr. Bill Popp there for answers to any questions you may have, or for a demonstration of its capabilities.

INTRODUCTION

The National Center for State Courts Computerized Interactive Research System (CONRES) is a computer program designed to aid NCSC researchers in the evaluation of court systems and the preparation of reports.

It has been designed with the non-technical user in mind: lawyers, researchers, and secretaries, i.e., the projected users of the system. It is "interactive," that is to say, the computer conducts a conversation with the user, guiding him step by step through the procedure needed to obtain the information which he desires. The capabilities of the system are described in this handbook. The normal handbook format is somewhat inadequate to describe this type of system. It is much better understood by observing the system in use, which entails watching the constant interplay between man and machine. Nonetheless, we are presenting the system in this handbook format with the hope you will entertain a live demonstration.

The research system is not only easy to use, it is also inexpensive and fast. Tasks can be performed in a fraction of the time normally needed by staff, at appropriate savings. The research system is supported and documented. If alterations are desired, or changes needed by Center offices, these can be provided by programmers "tailor made" to fit your requirements. The system is also being updated continually. Features not shown or mentioned in this report will become available periodically. In its present form, however, we believe the NCSC CONRES can provide the research needs of many projects.

The author has been advised that no breach of confidentiality exists in using actual examples from masper (the Massachusetts Personnel file), but readers should be aware that names have not been changed to protect the guilty.

Read this material carefully first. Then if you have any inquiries, direct them to Bill Popp at NERO.

CONVENTIONS

Preparatory to anything, a word on the conventions used in this illustrative handbook. All comments in this italic font are the writer's remarks on what the user, or computer, is doing. None of this would appear in an actual usage of the research system. The actual dialogue with the computer is in this font. It has been run on the computer and then "pasted up" for the purposes of this handbook. Entries in this typeface which are preceded by an arrow ( ) beyond the left-hand margin are the user's responses typed into the typewriter/computer in answer to promptings by the program. These entries would change from usage to usage according to what the user -- YOU -- wanted out of the research system.

PROCEDURE

We are going to take a brief tour of the NCSC Interactive Research System. Only a few of the myriad possible uses are illustrated by examples; the system's powers are by no means exhausted. We will generally proceed by following the system through an entire actual conversation, just as it would appear to the user (without, of course, the commentary) which will then be followed by a sample portion of the results which would be produced by a conversation.

A NOTE ON DATA FILES

You will see considerable talk of "data files." By these are meant the collections of records -- on Tabulating (keypunch, IBM) cards, or magnetic tape, or just lines of information sitting in the computer's memory -- which the user has put together in the course of his research. Very little education is needed to create data files - perhaps a half day with someone familiar with computers should suffice. The easiest method for large bulks of information is to have the information keypunched onto IBM cards by a local professional typing/keypunch agency. Shorter collections can just be typed into the typewriter and "saved" in memory. Two samples of such records can be seen in Appendix 1 of this handbook. They represent the two data files which are used as examples in the operations of the research system as seen in this report. Note that where individual bits of information are to be found ("data fields" such as name, salary, date, etc.) must be standardized. A key to whatever codes are used, if any, should be kept by the user in order to help avoid confusion at a later date.

" START HERE "

We turn on the computer, sitting at the typewriter which now is linked to a computer, and call for the research system. It carries on its half of the conversation by typing out what is has to say; we respond by typing our answers (never forgetting to hit the "carriage return" to finalize our comments. To begin with, it says:

This is the National Center for State Courts Computerized Research System. You may now choose what to do from this, the Primary Set of Options.

0. a general introduction to the system
1. description of each primary option and its uses
2. list of data files
3. file sort
4. retrieval
5. display
6. statistics
7. build a report
8. stop

Type the number corresponding to the desired option and push the carriage return.

This is the "Primary Set of Options" to which the system will return the user after he completes using any of the tools listed as options in it. Similarly, most of the options have their <u>own</u> list of options, to which the user is returned after finishing a minor task within the major option, but before finishing what he wanted to do. In the future, we will omit showing this list (above) after finishing a section, for reasons of space. Before trying to do anything with the research system, let's take a look at a review of what the system can do; we'll go to the "description of each primary option and its uses," option 1, by typing

→ 1

DESCRIPTION OF EACH PRIMARY OPTION AND ITS USES

DESCRIPTION OF EACH PRIMARY OPTION AND ITS USES
First of all, every time the program asks for some piece of data and you type it in, you must hit the carriage return for the program to read that data and continue on.
Also, if you've made a mistake on the line you are typing, you can backspace and type your line over from the point of the mistake.
If you've already returned the line, the computer won't allow you to change it. But that's okay, you can fix it next time around.
Now to continue with the description of the options, using various manipulations of the Massachusetts Personnel file *(Sample - Appendix 1)* as examples of what can be done.

OPTION 1. Description of each primary option and its uses.
You are presently viewing the results of having asked for Option 1.

OPTION 2. List of Data Files. This is a list of whatever data files are available for manipulation by whatever other options are chosen.

OPTION 3. Sort Subroutine.
This option allows you to sort a data file by its data fields. Using Mass. Personnel as an example, you can sort by job title and alphabetically within each job title; or first by type of employee (full or part time) and then by job title within each type, and then alphabetically by name within each job title, etc. These can be in either ascending or descending order, so you can get lowest to highest, or highest to lowest, or whatever. In other words, you can sort any way you want.

OPTION 4. Retrieval
Here you may search for and retrieve information about a single person, group of persons, everyone having the same name, working in the same office, or who did or are more or less than a given figure. What I'm trying to say is that if you can figure out a way to designate some group, you can pick it out of the whole file. This will make sense when you ask for the program.

OPTION 5. Display
This can be used to list small files of your own choosing--whether in your "library" or ones you just created using the research system--at the typewriter.

OPTION 6. Statistics
Included are the mean, standard deviation, and frequency distribution. This option can be used with any data file you have or make, of course. It includes all the information you need on how to specify exactly what statistics you want.

OPTION 7. Build a Report
This option allows you to create a report according to your own chosen format and including whatever data in whatever file you wish to have presented.

OPTION 8. Stop
When you're done, and want out, this exits you from the program and returns you to computer control outside the research system.

Just remember that the examples shown are just that, only examples. What you can do depends on your own ingenuity. Got it? Alright, we're ready to do some work.

When ready to continue, hit the carriage return
→(RETURN)

And off we go. Hitting the carriage return here returns us to the list of Primary Options (which is omitted for considerations of space) so that we can proceed to use the research system.

The first primary option we will see is #2, the list of the available data files. This is a "convenience feature" of the system, allowing the research system to be self-contained, i.e., to contain <u>everything</u> you need to know about it in order to use it. If, while at the Primary Set of Options, we typed "2" it would say:

LIST OF AVAILABLE DATA FILES

This option only lists information about the user's data file and allows him to change his information <u>about</u> the data file: it does <u>not</u> change the actual file itself in any way.

Here you would see the names of the files your regional office has collected. Of course, this list would vary from office to office. Seen here is an abbreviated sample of the files currently on the system.

The following are the computer names of all the data files currently in the user's "library" which are available for manipulation. They are followed by an indication of their size (length in # of lines) and an English explanation of what they contain:

masper
6319 records.
Contains the following information on each person in the Massachusetts court system, as of Summer 1974; name (last, first, i.), salary, job title, type of employee, full or part time, per diem rate if not salaried, supervisor's code.

nj
1126 records
Case load of New Jersey traffic court, selected months, 1971-1974. Contains: date or charge, dates of hearing, trial, sentencing, date of final disposition (if different than preceding), id code, other. Coded but beyond read limit: name, other.

der1
922 records
Contains names of all supervisors in masper; created by sort option applied to masper; contains same data.

And so forth.

So that the user can augment, delete, and update both his list of files and information about them, the system asks when the list is finished:

Do you wish to delete any files?
→ no
Do you wish to add any files?
→ no
Do you wish to change any information?
→ yes
Do you wish to change:
1. file name
2. size of file
3. commentary
Enter desired alteration and RETURN.
→ 2
What is the name of the file?
→ masper
Enter change (up to 80 characters and spaces):
→ 6500 records.
Do you wish to make any other changes to any file?
→ no

At this point, or if no alterations had been made at all, the user would be returned to the Primary Set of Options. With this change, next time the list of files was displayed, the system would say:

masper
6500 records
(etc.)

which would advise the user that there were 6500 data cards in the file, i.e., that it was 6500 lines long.

But now we're back in the primary options, ready to choose our next option, sorting.

```
This is the sort option.  You may now choose:
     1.  explanation of sorting
     2.  instructions for batch sort
     3.  terminal sort
Enter # corresponding to desired option and RETURN.
1
Two types of sorts are available, differing only in where they
obtained: (1) interactive sort, which is produced conversationally
at the typewriter, where it displays its results, and (2) batch
sort, which is introduced directly into the "batch jobs"
at the computing center where the final product is picked up.
Exceptionally large files normally are sorted in "batch" because
of the much more rapid printing speed of the line printer at any
computer center, which greatly exceeds the speed of the typewriter.
Both sorts require the user to designate where the data field is,
and whether the result should be in ascending (e.g. 1,2, then 3
etc. or a,b, then c) or descending (highest to lowest: e.g., 3,2,1
etc.) order.  If more than one field is designated, the file will
be sorted first by the first field given, then within that order,
by the second field; note that different fields may also differ
in their order.

This is the sort option.  You may now choose:
     1.  explanation of sorting
     2.  instructions for batch sorting
     3.  terminal sort
Enter # corresponding to desired option and RETURN.
2
Batch Sort
To obtain a batch sort:
```

There would follow here instructions to the user on how to proceed, step by step, to obtain a sort at the computer center. Since this procedure differs slightly from center to center, it is omitted here. As part of the support offered for the NCSC Interactive Research System, exact and explicit instructions tailor-made to your regional center would be added here. The usual method is simply to walk over to the user's computer center, type out two or three keypunch (IBM Tab) IBM cards according to a format given in the instructions, and place them on a table or in a bin where the computer operator will pick them up and submit them to the machine. Then, some time later, the user can pick up his results which will be sitting in an "out" bin along with the original cards.

RETRIEVAL

If the user had chosen the option "retrieval" by entering the number 4, he would be presented with:

```
Beginning RETREV
If you are a beginner at the retrieval game, type 1;
if you are an expert, enter 2.  Remember to RETURN.
→1
```

(If the user chose "expert" by typing 2, the long explanations which follow would be omitted; we will see an example of this other option a little later.)

To use this retrieval program, it is necessary to tell the computer where the data field which is to be retrieved is and then which individuals you wish to select out of it. The others will be ignored.

EXAMPLE 1. To select all the Smiths from the Mass. Personnel file, you would tell the research system in which column the last name began, and in which column it ended--001 and 022 in this case. Then you would enter the "Match" option, and "smith" when the system prompted you for your option and retrieval criterion, respectively. This would create a list of all persons whose last name is Smith.

EXAMPLE 2. If you wanted to further qualify this selection by cutting down the list to only the Smiths who earned more than $9,000 you would respond "yes" when the system asks if you want to add further qualifications, then the beginning and ending column numbers for salary (043 and 047 in Mass. Per.), "Greater Than" for your option, and 9000 for your test criterion. This would produce a list of all Smiths earning more than $9000. Up to 10 of these criteria can be added; thus it is possible (using Mass. Per. as an example) to retrieve all the Smiths earning more than 9000 dollars, less than 15000 dollars, who work in Allston, and who are clerks in 5 passes through the retrieval program.

```
     In your current file:
columns  1  to  10  contain:  abbott wil
columns 11  to  20  contain:  liam r
columns 21  to  30  contain:     ct off
columns 31  to  40  contain:
columns 41  to  50  contain:   12841
columns 51  to  60  contain:        c n
columns 61  to  70  contain:      wint
columns 71  to  80  contain:
```

This display of a sample record of the data file in use acts as an aid in determining the correct beginning and ending column numbers for use in the following questions. It is only an aid, and it is suggested that the user have a sample with line numbers and codes handy when using retrieval.

```
Please enter the parameters of the field with which you are
going to be dealing, in the form: xxx, i.e., column 5 would
be 005, column 23 would be 023, and hit RETURN.
001
Enter ending column number and RETURN.
005
You may now choose among various options re: picking out
specific records.  If the field you just selected contains
letters (e.g., SMITH) you may either
     (1)  retrieve all individuals who MATCH
a name (string of letters) you will enter later, or
     (2)  retrieve all who do NOT Match
this criterion you will later input.
If the field you selected contains numbers (e.g. 12,825)
you may retrieve either all those examples which
     (3)  are LESS THAN
a number of your choice (your test criterion)
     (4)  or are EQUAL TO that number,
     (5)  or are GREATER THAN it.
The test criterion is entered after you have chosen your option.
                         OPTIONS:

     (1)        MATCH (alphabetic characters only)
     (2)        NOT Match (alphabetic characters only)
     (3)        LESS THAN (numbers only)
     (4)        EQUAL TO (numbers only)
     (5)        GREATER THAN (numbers only)
Enter desired option number and RETURN.
1
```

You may now enter whatever criterion you wish to compare with the other data in the field you just selected; e.g., the name "smith" or the salary figure 25000, or the place of work code "phred." Whatever option you chose above will be performed upon it in relation to the data file. Please note that the length of the test word or number should not exceed the length of between the beginning and ending columns you chose previously.

Enter test criterion

→smith

We have just told the system to look in the columns containing last names, and to select out for our observation all those examples which MATCH the criterion "smith."

Do you wish to further qualify your retrieved information?

→yes

If we had chosen "no" the list of the smiths would have been computed. But to exhaust some options we did not choose on the last pass through retrieval, let's make further qualifications on the exact Smiths we want.

You are a beginner. Do you wish to change to expert?

→yes

Here the user, if he understands the procedure for using the retrieval option, can skip the lengthy explanations. We will now see what the conversation would have looked like if "expert" had been chosen when first coming into retrieval. A "no" here would produce a conversation just like the one above.

Please enter the parameters of the field with which you are going to be dealing, in the form: xxx, i.e., column 5 would be 005, column 23 would be 023, and hit RETURN.

→043

We are going to designate the salary field in the Mass. Personnel file, 043 to 047.

Enter ending column number and RETURN.

→047

OPTIONS:

(1) MATCH
(2) NOT Match
(3) LESS THAN
(4) EQUAL TO
(5) GREATER THAN

Note the abbreviated questions and omission of the qualifiers "alphabetic only" and "numbers only" which beginners saw.

```
Enter desired option number and RETURN.
→ 5
     Enter test criterion
→ 10000
Do you wish to further qualify your retrieved information?
→ yes
```

Let's see if there are any Smiths earning between $10,000 and $20,000 on the Massachusetts courts payroll.

```
You are an expert.  Do you wish to change to beginner?
→ no
Please enter the parameters of the field with which you
are going to be dealing in the form: xxx, i.e., column 5
would be 005, column 23 would be 023, and hit RETURN.
→ 043
Enter ending column number and RETURN.
→ 047
                              OPTIONS:

          (1)         MATCH
          (2)         NOT Match
          (3)         LESS THAN
          (4)         EQUAL TO
          (5)         GREATER THAN
Enter desired option number and RETURN.
→ 3
     Enter test criterion
→ 20000
Do you wish to further qualify your retrieved information?
→ no
```

At this point the machine will "think" for a moment, making a list of the Smiths earning between $10,000 and $20,000 annually. Then it will want to know what to do with the information you have had it retrieve.

```
Do you wish to save this file for later use?
→ yes
SAVED.  Your library now contains a file named ret1.  Please
remember to delete or rename this file before using the save
option of the retrieval option again.
```

```
There are    12 items ("hits") of the information which you
desired.  Do you wish to see any or all of them?
yes
Do you wish to see ALL or just SOME?
some
How many (up to 999) do you wish to see?  Enter
your choice as a 3 digit number and RETURN.
006
```

By telling the user exactly how many examples there are, the system allows him to make an intelligent choice as to whether or not a complete printout on the typewriter would be cumbersome. (If, say, all persons earning more than $2.98 annually had been retrieved, the complete printout could take several hours!) Here, although a display of all the retrieved records was quite feasible, we chose to exercise the partial option in order to illustrate its usage. The number of "hits" can also be used later as the subject of statistical operations (such as the percentage of Smiths being highly paid out of the total payroll, etc.). Our final product looks like:

```
smith arthur b          asst chief prob of 15623        c n    gaff
smith frederick         super heating plan 11089        c n    cott
smith francis a         asst clerk         17845        c n    keat
smith james             foreman electricia 11546        c n    ward
smith joseph a          sheriff            18729        c n    smi5
smith robert c          sr civil eng draft 10025        s      rand

total number of lines printed      6

When you are ready to continue, hit the carriage return.
(RETURN)
```

Returning us to the Primary Set of Options.
It should be emphasized that the power of the retrieval option to elect out desired groups is virtually limitless. Whatever kind of group the user can "invent" using the five options and his own choice of test criteria can be taken out of the file and either displayed or subjected to statistical manipulations. It is therefore possible, using the research system, to (for example) select out all the clerks and compute the frequency distribution of their salaries, a process that would take literally weeks if done by hand -- in a few minutes!

Our next option among the Primary Set of Options is number 6, display.

```
Do you wish to display a file other than your library file?
→no
Do you wish to see ALL or just SOME of this file?
→some
How many (up to 999) lines do you wish to see?  Enter your
choice as a 3 digit number.  RETURN.
→020
```

Since we designated a library file (Mass. Personnel in this case) and not a recently created file, the first 20 lines of information will be displayed. The "display" option is the most convenient option in the research system for the user who desires to see, in an unformatted form, some or all of a data file. The result of the brief conversation above is:

```
abbott william r        ct off              12841          c n     wint
abbott yuette           sr clk              06757          c n     grac
abbott dorothea         principal clerk     00000  000034  s       gayl
abbott joanne m         sr clerk & sten     06757          s       scha
abdala george s         asst d a            09499          s       rya3
abdella elizabeth a     prin clk            08223          c n     vigl
aberdale joseph r       prob off            11651          c n     mill
abrams samuel s         bookbinder          07571          c n     lync
abrams ruth i           assoc justice       34089          s       mc11
acerra linda            sr acct clk         01756  p       c n     rya5
acerra linda            sr acct clk         05268  p       c n     rya4
adams aleta             prin clk            07961          c n     char
adams charles           prob off            14189          c n     mout
adams doris y           prin clk            08749          c n     zamp
adams elizabeth a       jr clk              06710          c n     vigl
adams john              supt of bldgs       09401          c n     adam
adams samuel            assoc justice       34089          s       mc11
addario josephine       cleaner             06411          c n     foth
adduci annmarie         hear sten           08673          c n     byr3
affsa doreen            jr clk              05761          c n     fly2
```

STATISTICS

Having typed in "6" while in the Primary Options, we are taken to:

```
This is the Statistics option of the Computerized
Research System.  You may now choose from the following:
1.  explanation of the statistics option
2.  input of your parameters for running statistics
3.  sample statistical run
4.  getting a full statistical run
5.  return to the Primary Set of Options of the Computerized
    Research System
Enter and return the number of your chosen option.
2
```

The explanation, option 1, is an elementary review of what the various statistical operations (mean, standard deviation, etc.) mean. Therefore we can skip them, and continue.

```
Do ycu wish to perform statistics on a file other
than your library file?
no
```

If we had responded "yes" we would have been permitted to have the statistical operations performed on a file recently created by another option of the research system.

```
Now choose between:
1.  statistical parameter specification for beginners
2.  statistical parameter specification for experts
3.  return to the Statistics Option of the Computerized
    Research System
Enter and return the number of your chosen option
2
You will now tell the program how to find the
first data field upon which you wish to run statistics.
Enter its beginning column (bbb), and
length (111) as 3 digit numbers in this format:
bbb,111
043,005
What name do you wish to give to this data
field?  Enter a name up to 8 characters long.
SALARY
```

An appropriate name, since we have designated the salary field of Mass. Personnel as our subject for analysis.

```
What statistics do you wish to run on this
data field?

1.  mean and standard deviation
2.  mean, standard deviation, and frequency distribution.
Enter the number of your choice
2
```

You will now outline for the program how to arrange
the frequency distribution for this data field.
What is the initial number (iiiiiii) of the range and
the ending number (eeeeeee), both 7 digit numbers in
this format:
iiiiiii,eeeeeee
→ 0005000,0025000
How many funnels (fff) do you desire
within that range? You may specify up to 100 funnels.
Enter your choice as a 3 digit number in this format:
fff
→ 020

In the conversation above we told the system that we wanted, after the mean and standard deviation of the entire file had been prepared, a frequency distribution analysis of the salary range 5,000 to 25,000. By specifying 20 funnels in that range (a range of 20,000), we have insured that the system will tell us how many people fall into each 1,000 unit (dollars in this case) range. If we had specified 80 funnels, we would have been presented with a frequency distribution broken down into $250 increments. Having now delimited our parameters, we are ready to return to the statistical options.

Do you wish to run statistics on another data field?
→ no
Now choose between:
1. statistical parameter specification for beginners
2. statistical parameter specification for experts
3. return to the Statistics option of the Computerized
   Research System
Enter and return number of your chosen option.
→ 3
This is the Statistics option of the Computerized
Research System. You may now choose from the following:
1. explanation of the statistics option
2. input of your parameters for running statistics
3. sample statistical run
4. getting a full statistical run
5. return to the Primary set of Options of the Computerized
   Research System
Enter and return the number of your chosen option.
→ 3

The sample statistical run (option 3) performs your designated statistics on the first 50 records of your data file, giving the sample results almost instantaneously. This allows the user to alter the report's format if it does not meet his expectations. After we have typed in "4" the machine computes the statistics requested, and produces a result which looks like:

SALARY : columns 43 through 47
MEAN: 10489.00 STANDARD DEVIATION: 10497.64

FREQUENCY DISTRIBUTION

BETWEEN	5000	AND	5999:	447
BETWEEN	6000	AND	6999:	862
BETWEEN	7000	AND	7999;	879
BETWEEN	8000	AND	8999:	551
BETWEEN	9000	AND	9999:	556
BETWEEN	10000	AND	10999:	370
BETWEEN	11000	AND	11999:	375
BETWEEN	12000	AND	12999:	411
BETWEEN	13000	AND	13999:	250
BETWEEN	14000	AND	14999:	429
BETWEEN	15000	AND	15999:	101
BETWEEN	16000	AND	16999:	109
BETWEEN	17000	AND	17999:	174
BETWEEN	18000	AND	18999:	107
BETWEEN	19000	AND	19999:	83
BETWEEN	20000	AND	20999:	22
BETWEEN	21000	AND	21999:	18
BETWEEN	22000	AND	22999:	26
BETWEEN	23000	AND	23999:	13
BETWEEN	24000	AND	24999:	11

The number of data values from this field which were less than the initial number of your specified range: 325
The number of data values from this field which were greater than the ending number of your specified range: 199

NUMBER OF LINES READ UPON WHICH STATS WERE PERFORMED: 6319

Do you wish to save this file?
yes
SAVED. A file named stat1 is now in your library. Please remember to delete or rename this file before using the save option of the retrieval option again.

This allows us to carry this information over to either the formatting option of Build a Report, or any other option of the research system. The data gathered by this conversation, as seen above, is now permanently retained.

When ready to continue, hit the carriage return.
(RETURN)

Having hit "RETURN" we are passed back to the Primary Set of Options where we will choose to see the next, and last, primary option.

BUILD - A - REPORT

If we choose option 7 of the Primary Set of Options, we would enter the "Build a Report" option, the most powerful method of obtaining a report from the research system which is available from the computer. It presents the user with options on the way he wants to format his report, and what information he can include in it. If we choose "7" the system says:

```
This is the "Build a Report" option of the Computerized
Research System.
You may now choose:  1.  explanation
                     2.  formatting the report
                     3.  calculation of elapsed time
                     4.  report statistics
                     5.  sample report
                     6.  getting the full report
                     7.  return to the Primary Set of Options
                         of the research system
Type the # corresponding to the desired option and return it.
→ 2
```

(We'll skip the explanation of Build a Report, as its uses will become clear as our tour through the research system continues.

```
Now choose between:
            1.  Report formatting for beginners.
            2.  Report formatting for experts.
Enter and return desired option's number.
→ 1
Do you want the report to be single or double
spaced?  Enter single or double, then hit RETURN.
→ single
Enter the report date in this manner:
mm/dd/yy
→ 10/25/74
Name the report.  It can be up to 26 characters
and spaces long.
→ Sam Conti
 You are now about to enter those column titles
which will appear across the top of the printed report page.
First enter the titles for columns 1 - 64.
```

BUILD - A - REPORT

If we choose option 7 of the Primary Set of Options, we would enter the "Build a Report" option, the most powerful method of obtaining a report from the research system which is available from the computer. It presents the user with options on the way he wants to format his report, and what information he can include in it. If we choose "7" the system says:

```
This is the "Build a Report" option of the Computerized
Research System.
You may now choose:  1.  explanation
                     2.  formatting the report
                     3.  calculation of elapsed time
                     4.  report statistics
                     5.  sample report
                     6.  getting the full report
                     7.  return to the Primary Set of Options
                         of the research system
Type the # corresponding to the desired option and return it.
→2
```

(We'll skip the explanation of Build a Report, as its uses will become clear as our tour through the research system continues.

```
Now choose between:
          1.  Report formatting for beginners.
          2.  Report formatting for experts.
Enter and return desired option's number.
→1
Do you want the report to be single or double
spaced?  Enter single or double, then hit RETURN.
→single
Enter the report date in this manner:
mm/dd/yy
→10/25/74
Name the report.  It can be up to 26 characters
and spaces long.
→David Halperin
 You are now about to enter those column titles
which will appear across the top of the printed report page.
First enter the titles for columns 1 - 64.
```

BUILD - A - REPORT

If we choose option 7 of the Primary Set of Options, we would enter the "Build a Report" option, the most powerful method of obtaining a report from the research system which is . ailable from the computer. It presents the user with options on the way he wants to format his report, and what information he can include in it. If we choose "7" the system says:

```
This is the "Build a Report" option of the Computerized
Research System.
You may now choose:   1.   explanation
                      2.   formatting the report
                      3.   calculation of elapsed time
                      4.   report statistics
                      5.   sample report
                      6.   getting the full report
                      7.   return to the Primary Set of Options
                           of the research system
Type the # corresponding to the desired option and return it.
→ 2
```

(We'll skip the explanation of Build a Report, as its uses will become clear as our tour through the research system continues.

```
Now choose between:
            1.  Report formatting for beginners.
            2.  Report formatting for experts.
Enter and return desired option's number.
→ 1
Do you want the report to be single or double
spaced?  Enter single or double, then hit RETURN.
→ single
Enter the report date in this manner:
mm/dd/yy
→ 10/25/74
Name the report.  It can be up to 26 characters
and spaces long.
→ Grant Davis
 You are now about to enter those column titles
which will appear across the top of the printed report page.
First enter the titles for columns 1 - 64.
```

BUILD - A - REPORT

If we choose option 7 of the Primary Set of Options, we would enter the "Build a Report" option, the most powerful method of obtaining a report from the research system which is available from the computer. It presents the user with options on the way he wants to format his report, and what information he can include in it. If we choose "7" the system says:

```
This is the "Build a Report" option of the Computerized
Research System.
You may now choose:  1.  explanation
                     2.  formatting the report
                     3.  calculation of elapsed time
                     4.  report statistics
                     5.  sample report
                     6.  getting the full report
                     7.  return to the Primary Set of Options
                         of the research system
   Type the # corresponding to the desired option and return it.
→2
```

(We'll skip the explanation of Build a Report, as its uses will become clear as our tour through the research system continues.

```
   Now choose between:
                1.  Report formatting for beginners.
                2.  Report formatting for experts.
   Enter and return desired option's number.
→1
   Do you want the report to be single or double
   spaced?  Enter single or double, then hit RETURN.
→single
   Enter the report date in this manner:
   mm/dd/yy
→10/25/74
   Name the report.  It can be up to 26 characters
   and spaces long.
→Ed McConnell
    You are now about to enter those column titles
   which will appear across the top of the printed report page.
   First enter the titles for columns 1 - 64.
```

BUILD - A - REPORT

If we choose option ? of the Primary Set of Options, we would enter the "Build a Report" option, the most powerful method of obtaining a report from the research system which is available from the computer. It presents the user with options on the way he wants to format his report, and what information he can include in it. If we choose "?" the system says:

```
This is the "Build a Report" option of the Computerized
Research System.
You may now choose:  1.   explanation
                     2.   formatting the report
                     3.   calculation of elapsed time
                     4.   report statistics
                     5.   sample report
                     6.   getting the full report
                     7.   return to the Primary Set of Options
                          of the research system
Type the # corresponding to the desired option and return it.
→2
```

(We'll skip the explanation of Build a Report, as its uses will become clear as our tour through the research system continues.

```
Now choose between:
            1.  Report formatting for beginners.
            2.  Report formatting for experts.
Enter and return desired option's number.
→1
Do you want the report to be single or double
spaced?  Enter single or double, then hit RETURN.
→single
Enter the report date in this manner:
mm/dd/yy
→10/25/74
Name the report.  It can be up to 26 characters
and spaces long.
→Bill Connor
 You are now about to enter those column titles
which will appear across the top of the printed report page.
First enter the titles for columns 1 - 64.
```

BUILD - A - REPORT

If we choose option 7 of the Primary Set of Options, we would enter the "Build a Report" option, the most powerful method of obtaining a report from the research system which is available from the computer. It presents the user with options on the way he wants to format his report, and what information he can include in it. If we choose "7" the system says:

```
This is the "Build a Report" option of the Computerized
Research System.
You may now choose:  1.  explanation
                     2.  formatting the report
                     3.  calculation of elapsed time
                     4.  report statistics
                     5.  sample report
                     6.  getting the full report
                     7.  return to the Primary Set of Options
                         of the research system
Type the # corresponding to the desired option and return it.
→2
```

(We'll skip the explanation of Build a Report, as its uses will become clear as our tour through the research system continues.

```
Now choose between:
            1.  Report formatting for beginners.
            2.  Report formatting for experts.
Enter and return desired option's number.
→1
Do you want the report to be single or double
spaced?  Enter single or double, then hit RETURN.
→single
Enter the report date in this manner:
mm/dd/yy
→10/25/74
Name the report.  It can be up to 26 characters
and spaces long.
→Francis Taillefer
 You are now about to enter those column titles
which will appear across the top of the printed report page.
First enter the titles for columns 1 - 64.
```

BUILD - A - REPORT

If we choose option 7 of the Primary Set of Options, we would enter the "Build a Report" option, the most powerful method of obtaining a report from the research system which is available from the computer. It presents the user with options on the way he wants to format his report, and what information he can include in it. If we choose "7" the system says:

```
This is the "Build a Report" option of the Computerized
Research System.
You may now choose:  1.  explanation
                     2.  formatting the report
                     3.  calculation of elapsed time
                     4.  report statistics
                     5.  sample report
                     6.  getting the full report
                     7.  return to the Primary Set of Options
                         of the research system
Type the # corresponding to the desired option and return it.
→ 2
```

(We'll skip the explanation of Build a Report, as its uses will become clear as our tour through the research system continues.

```
Now choose between:
            1.  Report formatting for beginners.
            2.  Report formatting for experts.
Enter and return desired option's number.
→ 1
Do you want the report to be single or double
spaced?  Enter single or double, then hit RETURN.
→ single
Enter the report date in this manner:
mm/dd/yy
→ 10/25/74
Name the report.  It can be up to 26 characters
and spaces long.
→ Larry Sipes
 You are now about to enter those column titles
which will appear across the top of the printed report page.
First enter the titles for columns 1 - 64.
```

BUILD - A - REPORT

If we choose option 7 of the Primary Set of Options, we would enter the "Build a Report" option, the most powerful method of obtaining a report from the research system which is available from the computer. It presents the user with options on the way he wants to format his report, and what information he can include in it. If we choose "7" the system says:

```
This is the "Build a Report" option of the Computerized
Research System.
You may now choose:   1.  explanation
                      2.  formatting the report
                      3.  calculation of elapsed time
                      4.  report statistics
                      5.  sample report
                      6.  getting the full report
                      7.  return to the Primary Set of Options
                          of the research system
Type the # corresponding to the desired option and return it.
→2
```

(We'll skip the explanation of Build a Report, as its uses will become clear as our tour through the research system continues.

```
Now choose between:
            1.  Report formatting for beginners.
            2.  Report formatting for experts.
Enter and return desired option's number.
→1
Do you want the report to be single or double
spaced?  Enter single or double, then hit RETURN.
→single
Enter the report date in this manner:
mm/dd/yy
→10/25/74
Name the report.  It can be up to 26 characters
and spaces long.
→Arne Schoeller
 You are now about to enter those column titles
which will appear across the top of the printed report page.
First enter the titles for columns 1 - 64.
```

BUILD - A - REPORT

If we choose option 7 of the Primary Set of Options, we would enter the "Build a Report" option, the most powerful method of obtaining a report from the research system which is available from the computer. It presents the user with options on the way he wants to format his report, and what information he can include in it. If we choose "7" the system says:

```
This is the "Build a Report" option of the Computerized
Research System.
You may now choose:  1.  explanation
                     2.  formatting the report
                     3.  calculation of elapsed time
                     4.  report statistics
                     5.  sample report
                     6.  getting the full report
                     7.  return to the Primary Set of Options
                         of the research system
Type the # corresponding to the desired option and return it.
→2
```

(We'll skip the explanation of Build a Report, as its uses will become clear as our tour through the research system continues.

```
Now choose between:
                1.  Report formatting for beginners.
                2.  Report formatting for experts.
Enter and return desired option's number.
→1
Do you want the report to be single or double
spaced?  Enter single or double, then hit RETURN.
→single
Enter the report date in this manner:
mm/dd/yy
→10/25/74
Name the report.  It can be up to 26 characters
and spaces long.
→R. Hanson Lawton
 You are now about to enter those column titles
which will appear across the top of the printed report page.
First enter the titles for columns 1 - 64.
```

(Using our familiar example, the Massachusetts Personnel file, let's make a report listing the name, salary, and supervisor code for the individuals in the file. Thus we would want:)

```
                    NAME                            SALARY
Now enter the titles for columns 65 - 128
SUPERVISOR
You will now tell the system how to find those data
fields which you wish to appear on your report.
In which column does the next (or first, if this is
the first time through) desired data field begin on
the punched card?  Enter it as a three-digit number.
001
```

(As we saw in earlier examples, columns 001 to 022 contain the NAME in the Mass. Personnel file; below we will input the appropriate columns for SALARY (043-047) and for SUPERVISOR (062-065) code.)

```
How many columns does the data field occupy?
Enter it as a three-digit number.
022
Beginning in which column on the report do you want
this data printed?  Enter it as a three-digit number.
010
```

(This will cause the name out of the data file to be printed under the heading "NAME" which we created above, spaced about evenly.)

```
Do you wish to include another data field?
yes
You will now tell the system how to find those data
fields which you wish to appear on your report.
In which column does the next (or the first, if this is
the first time through) desired data field begin on
the punched card?  Enter it as a three-digit number.
043
How many columns does the data field occupy?
Enter it as a three-digit number.
005
Beginning in which column on the report do you want
this data printed?  Enter it as a three-digit number.
040
Do you wish to include another data field?
yes
You will now tell the system how to find those data
fields which you wish to appear on your report. In
which column does the next (or the first, if this is
the first time through) desired data field begin on
the punched card?  Enter it as a three-digit number.
062
```

How many columns does the data field occupy?
Enter it as a three-digit number.
→ 004
Beginning in which column on the report do you want
this data printed? Enter it as a three-digit number.
→ 065
Do you wish to include another data field?
→ no

Having completed our third pass through the formatting procedure, the system now knows where to place what information. Therefore it returns us to options which can present us with the finished product.

This is the "Build a Report" option of the Computerized
Research System.
You may now choose:
1. explanation
2. formatting the report
3. calculation of elapsed time
4. report statistics
5. sample report
6. getting the full report
7. return to the Primary Set of Options of the research system

Type the # corresponding to the desired option and return it.
→ 5

The sample report option makes a report out of the first 20 lines of the data file being used so that the user can see if the margins correspond to his desires, etc. Once the user is satisfied with the format, he can choose to have the full report printed on the terminal or, in the case of a lengthy report, on a fast printer at the computer center. It would have looked exactly like the sample below, except that the pages would have been numbered sequentially. The result of our above efforts looks like:

NATIONAL CENTER FOR STATE COURTS DATE 10/25/74.

Sam Conti Report PAGE NO 1

NAME	SALARY	SUPERVISOR
abbott william r	12841	wint
abbott yuette	06757	grac
abbott dorothea	00000	gay1
abbott joanne m	06757	scha
abdala george s	09499	rya3

How many columns does the data field occupy?
Enter it as a three-digit number.
→004
Beginning in which column on the report do you want
this data printed? Enter it as a three-digit number.
→065
Do you wish to include another data field?
→no

Having completed our third pass through the formatting procedure, the system now knows where to place what information. Therefore it returns us to options which can present us with the finished product.

This is the "Build a Report" option of the Computerized
Research System.
You may now choose :
1. explanation
2. formatting the report
3. calculation of elapsed time
4. report statistics
5. sample report
6. getting the full report
7. return to the Primary Set of Options of the research system

Type the # corresponding to the desired option and return it.
→5

The sample report option makes a report out of the first 20 lines of the data file being used so that the user can see if the margins correspond to his desires, etc. Once the user is satisfied with the format, he can choose to have the full report printed on the terminal or, in the case of a lengthy report, on a fast printer at the computer center. It would have looked exactly like the sample below, except that the pages would have been numbered sequentially. The result of our above efforts looks like:

NATIONAL CENTER FOR STATE COURTS DATE 10/25/74

Bill Connor Report PAGE NO 1

NAME	SALARY	SUPERVISOR
abbott william r	12841	wint
abbott yuette	06757	grac
abbott dorothea	00000	gayl
abbott joanne m	06757	scha
abdala george s	09499	rya3

How many columns does the data field occupy?
Enter it as a three-digit number.
→ 004
Beginning in which column on the report do you want
this data printed? Enter it as a three-digit number.
→ 065
Do you wish to include another data field?
→ no

Having completed our third pass through the formatting procedure, the system now knows where to place what information. Therefore it returns us to options which can present us with the finished product.

This is the "Build a Report" option of the Computerized
Research System.
You may now choose:
1. explanation
2. formatting the report
3. calculation of elapsed time
4. report statistics
5. sample report
6. getting the full report
7. return to the Primary Set of Options of the research system

Type the # corresponding to the desired option and return it.
→ 5

The sample report option makes a report out of the first 20 lines of the data file being used so that the user can see if the margins correspond to his desires, etc. Once the user is satisfied with the format, he can choose to have the full report printed on the terminal or, in the case of a lengthy report, on a fast printer at the computer center. It would have looked exactly like the sample below, except that the pages would have been numbered sequentially. The result of our above efforts looks like:

NATIONAL CENTER FOR STATE COURTS DATE 10/25/74

Ed McConnell Report PAGE NO 1

NAME	SALARY	SUPERVISOR
abbott william r	12841	wint
abbott yuette	06757	grac
abbott dorothea	00000	gayl
abbott joanne m	06757	scha
abdala george s	09499	rya3

How many columns does the data field occupy?
Enter it as a three-digit number.
→004
Beginning in which column on the report do you want
this data printed? Enter it as a three-digit number.
→065
Do you wish to include another data field?
→no

Having completed our third pass through the formatting procedure, the system now knows where to place what information. Therefore it returns us to options which can present us with the finished product.

This is the "Build a Report" option of the Computerized
Research System.
You may now choose:
1. explanation
2. formatting the report
3. calculation of elapsed time
4. report statistics
5. sample report
6. getting the full report
7. return to the Primary Set of Options of the research system

Type the # corresponding to the desired option and return it.
→5

The sample report option makes a report out of the first 20 lines of the data file being used so that the user can see if the margins correspond to his desires, etc. Once the user is satisfied with the format, he can choose to have the full report printed on the terminal or, in the case of a lengthy report, on a fast printer at the computer center. It would have looked exactly like the sample below, except that the pages would have been numbered sequentially. The result of our above efforts looks like:

NATIONAL CENTER FOR STATE COURTS DATE 10/25/74

Arne Schoeller Report PAGE NO 1

NAME	SALARY	SUPERVISOR
abbott william r	12841	wint
abbott yuette	06757	grac
abbott dorothea	00000	gay1
abbott joanne m	06757	scha
abdala george s	09499	rya3

How many columns does the data field occupy?
Enter it as a three-digit number.
→004
Beginning in which column on the report do you want
this data printed? Enter it as a three-digit number.
→065
Do you wish to include another data field?
→no

Having completed our third pass through the formatting procedure, the system now knows where to place what information. Therefore it returns us to options which can present us with the finished product.

This is the "Build a Report" option of the Computerized
Research System.
You may now choose:
1. explanation
2. formatting the report
3. calculation of elapsed time
4. report statistics
5. sample report
6. getting the full report
7. return to the Primary Set of Options of the research system

Type the # corresponding to the desired option and return it.
→5

The sample report option makes a report out of the first 20 lines of the data file being used so that the user can see if the margins correspond to his desires, etc. Once the user is satisfied with the format, he can choose to have the full report printed on the terminal or, in the case of a lengthy report, on a fast printer at the computer center. It would have looked exactly like the sample below, except that the pages would have been numbered sequentially. The result of our above efforts looks like:

NATIONAL CENTER FOR STATE COURTS DATE 10/25/74

Larry Sipes Report PAGE NO 1

NAME	SALARY	SUPERVISOR
abbott william r	12841	wirt
abbott yuette	06757	grac
abbott dorothea	00000	gayl
abbott joanne m	06757	scha
abdala george s	09499	rya3

How many columns does the data field occupy?
Enter it as a three-digit number.
→004
Beginning in which column on the report do you want
this data printed? Enter it as a three-digit number.
→065
Do you wish to include another data field?
→ no

Having completed our third pass through the formatting procedure, the system now knows where to place what information. Therefore it returns us to options which can present us with the finished product.

This is the "Build a Report" option of the Computerized
Research System.
You may now choose:
1. explanation
2. formatting the report
3. calculation of elapsed time
4. report statistics
5. sample report
6. getting the full report
7. return to the Primary Set of Options
of the research system

Type the # corresponding to the desired option and return it.
→5

The sample report option makes a report out of the first 20 lines of the data file being used so that the user can see if the margins correspond to his desires, etc. Once the user is satisfied with the format, he can choose to have the full report printed on the terminal or, in the case of a lengthy report, on a fast printer at the computer center. It would have looked exactly like the sample below, except that the pages would have been numbered sequentially. The result of our above efforts looks like:

NATIONAL CENTER FOR STATE COURTS DATE 10/25/74

Grant Davis Report PAGE NO 1

NAME	SALARY	SUPERVISOR
abbott william r	12841	wint
abbott yuette	06757	grac
abbott dorothea	00000	gayl
abbott joanne m	06757	scha
abdala george s	09499	rya3

How many columns does the data field occupy?
Enter it as a three-digit number.
→ 004
Beginning in which column on the report do you want
this data printed? Enter it as a three-digit number.
→ 065
Do you wish to include another data field?
→ no

Having completed our third pass through the formatting procedure, the system now knows where to place what information. Therefore it returns us to options which can present us with the finished product.

This is the "Build a Report" option of the Computerized
Research System.
You may now choose:

1. explanation
2. formatting the report
3. calculation of elapsed time
4. report statistics
5. sample report
6. getting the full report
7. return to the Primary Set of Options of the research system

Type the # corresponding to the desired option and return it.
→ 5

The sample report option makes a report out of the first 20 lines of the data file being used so that the user can see if the margins correspond to his desires, etc. Once the user is satisfied with the format, he can choose to have the full report printed on the terminal or, in the case of a lengthy report, on a fast printer at the computer center. It would have looked exactly like the sample below, except that the pages would have been numbered sequentially. The result of our above efforts looks like:

NATIONAL CENTER FOR STATE COURTS DATE 10/25/74

PAGE NO 1

Francis Taillefer Report

NAME	SALARY	SUPERVISOR
abbott william r	12841	wint
abbott yuette	06757	grac
abbott dorothea	00000	gay1
abbott joanne m	06757	scha
abdala george s	09499	rya3

How many columns does the data field occupy?
Enter it as a three-digit number.
→004
Beginning in which column on the report do you want
this data printed? Enter it as a three-digit number.
→065
Do you wish to include another data field?
→no

Having completed our third pass through the formatting procedure, the system now knows where to place what information. Therefore it returns us to options which can present us with the finished product.

This is the "Build a Report" option of the Computerized
Research System.
You may now choose:
1. explanation
2. formatting the report
3. calculation of elapsed time
4. report statistics
5. sample report
6. getting the full report
7. return to the Primary Set of Options of the research system

Type the # corresponding to the desired option and return it.
→5

The sample report option makes a report out of the first 20 lines of the data file being used so that the user can see if the margins correspond to his desires, etc. Once the user is satisfied with the format, he can choose to have the full report printed on the terminal or, in the case of a lengthy report, on a fast printer at the computer center. It would have looked exactly like the sample below, except that the pages would have been numbered sequentially. The result of our above efforts looks like:

NATIONAL CENTER FOR STATE COURTS DATE 10/25/74

R. Hanson Lawton Report PAGE NO 1

NAME	SALARY	SUPERVISOR
abbott william r	12841	wint
abbott yuette	06757	grac
abbott dorothea	00000	gayl
abbott joanne m	06757	scha
abdala george s	09499	rya3

How many columns does the data field occupy?
Enter it as a three-digit number.
→ 004
Beginning in which column on the report do you want
this data printed? Enter it as a three-digit number.
→ 065
Do you wish to include another data field?
→ no

Having completed our third pass through the formatting procedure, the system now knows where to place what information. Therefore it returns us to options which can present us with the finished product.

This is the "Build a Report" option of the Computerized
Research System.
You may now choose:
1. explanation
2. formatting the report
3. calculation of elapsed time
4. report statistics
5. sample report
6. getting the full report
7. return to the Primary Set of Options of the research system

Type the # corresponding to the desired option and return it.
→ 5

The sample report option makes a report out of the first 20 lines of the data file being used so that the user can see if the margins correspond to his desires, etc. Once the user is satisfied with the format, he can choose to have the full report printed on the terminal or, in the case of a lengthy report, on a fast printer at the computer center. It would have looked exactly like the sample below, except that the pages would have been numbered sequentially. The result of our above efforts looks like:

NATIONAL CENTER FOR STATE COURTS DATE 10/25/74

David Halperin Report PAGE NO 1

NAME	SALARY	SUPERVISOR
abbott william r	12841	wint
abbott yuette	06757	grac
abbott dorothea	00000	gayl
abbott joanne m	06757	scha
abdala george s	09499	rya3

```
abella elizabeth a          08223          vig1
aberdella joseph r          11651          mill
abrams ruth i               34089          mcll
abrams samuel s             07571          lync
acerra linda                01756          rya5
acerra linda                05268          rya4
adams aleta                 07961          char
adams charles               14189          mout
adams doris y               08749          zamp
adams elizabeth a           06710          vig1
adams john                  09401          adam
adams samuel                34089          mcll
addario josephine           06411          foth
adduci annmarie             08673          byr3
affsa doreen                05761          fly2

Total number of lines printed   20
```

Then when our report is finished, the system prompts:

```
When ready to continue, hit the carriage return.
(RETURN)
```

And we are presented again with the Build a Report list of seven options, as seen earlier. One of the most useful of these options is the "time lapse" calculation, which computes the elapsed time between any two dates, with automatic compensation for leap years. To see an example of a report prepared using this option, we will use a data file containing information about drunken driving cases in New Jersey; a sample of this file can be seen in Appendix 1. Two important dates are among the information contained ir the data for each example: the date charges were brought, and the aate of final disposition. We are going to compute the elapsed time between these two dates, which should give an idea of the delay in the N.J. municipal courts. First the report is formatted, as we did above. After that the time lag is calculated, then the two are combined into a report.

First we choose option 2, formatting the report:

```
Now choose between:
            1.   Report formatting for beginners.
            2.   Report formatting for experts.
Enter and return desired option's number.
2
```

We'll use the shorter "expert" version this time.

Do you want the report to be single or double
spaced? Enter single or double, then hit RETURN.
→ single
Enter the report date in this manner:
mm/dd/yy
→ 10/25/74
Name the report. It can be up to 26 characters
and spaces long.
→ N.J. TRAFFIC DELAY
You are now about to enter those column titles
which will appear across the top of the printed report page.
First enter the title for columns 1 - 64.
→ CHARGES BROUGHT DISPOSITION DATE TIME
Now enter the titles for columns 65 - 128
→ LAPSE
You will now tell the system how to find those data
fields which you wish to appear in your report.
Enter the data's beginning column (bbb),
length (lll), and where (www) it should be put on the printed
page (all as 3 digit numbers) in this format:
bbb,lll,www
→ 014,006,015
Do you wish to include another data field?
→ yes
Enter the data's beginning column (bbb),
length (lll), and where (www) it should be put on the printed
page (all as 3 digit numbers) in this format:
bbb,lll,www
→ 021,006,042
Do you wish to include another data field?
→ no

We are now returned to the seven options of the Build a Report section and go to our next step, time lapse calculation. Note that in designating information to be put in the report we have omitted any information to be placed around columns 62-70, under the heading TIME LAPSE: this data will be provided by the time lapse calculation option. Since we are at the choice of options (not pictured for reasons of space), we now type in 3:

Time lapse calculation.
In which column on the data card does the first
desired date begin? Enter it as a 3 digit number.
→ 014
In which column on the data card does the other date
begin? Enter it as a 3 digit number.
→ 021
In which column on the report page do you want the time
elapse data to be printed? Enter it as a 3 digit number.
→ 064
Do you wish to calculate the time elapsed between any
other dates on the data card?
→ no

And once again it will return us to the seven options of Build a Report. Note that the system, knowing that all dates will be only 6 columns long, does not ask for the length of the data field. Now for the third and last step, getting the report. We will use the sample report option (number 5) again:

→ 5

NATIONAL CENTER FOR STATE COURTS DATE 10/25/74

N.J. TRAFFIC DELAY PAGE NO 1

CHARGES BROUGHT	DISPOSITION DATE	TIME LAPSE
043074	051374	00013
050674	052374	00017
041473	042673	00012
041973	051073	00021
010573	050773	00123
012773	050773	00101
031672	050773	00418
091972	050773	00231
021872	050773	00445
121771	050973	00510
111272	050973	00179
101971	050273	00562
122371	050273	00497
111172	050273	00173
091272	050273	00233

Total number of lines printed 15

When ready to continue, hit the carriage return.
→ (RETURN)

And we are back yet once more to:

This is the "Build a Report" option of the Computerized Research System.
You may now choose:
1. explanation
2. formatting the report
3. calculation of elapsed time
4. report statistics
5. sample report
6. getting the full report
7. return to the Primary Set of Options of the research system

Type the # corresponding to the desired option and return it.

As you can see, considerable flexibility can be had with the program. We do not have sufficient time or space to show an example of every combination and permutation of every option; these examples should suffice to provide the gist of the capabilities of Build a Report. We have not seen, e.g., the report statistics option, which allows the user to do such operations as: repeated division by a single number, mean, median, percentages, and other simple but time consuming tasks. As in the other options, the specific operations and graphics of the Build a Report option can be tailor-made to suit your individual needs. Lastly, it should be mentioned that all the manipulations seen above can also be performed on a file created by you using the retrieval or statistical options of the NCSC Interactive Research System.

Since we have now finished our tour of the NCSC Interactive Research System, we will type 7, returning to the Primary Set:

```
This is the National Center for State Courts Computerized
Research System.  You may now choose what to do from this,
the Primary Set of Options.
    0.  a general introduction to the system
    1.  description of each primary option and its uses
    2.  list of data files
    3.  file sort
    4.  retrieval
    5.  display
    6.  statistics
    7.  build a report
    8.  stop

→ 8
```

and leave.

APPENDIX 1

SAMPLE DATA FILE STRUCTURES

The Massachusetts Personnel file is formatted into an 80-character line, containing the following information, in the columns indicated:

FIELD CONTENTS	COLUMNS from - to
NAME (last, first, m.i.)	001 - 022
JOB TITLE	024 - 041
ANNUAL SALARY	043 - 047
TYPE (e.g., PULL or PART- TIME)	049 - 049
PER DIEM RATE (if not salaried)	051 - 056
SERVICE TYPE	058 - 058
PAYING AGENCY (Civil, federal, etc.)	060 - 060
HEAD OF OFFICE CODE	067 - 070

The other columns are blank. A sample of five records from this file illustrates the above division:

```
kean margaret g       pr clerk          09081        c n       coug
morrison leonard j    bldg cust         08749        c n       foth
dimond alan j         assoc justice     34089        s         mcll
milito anne m         sr clerk          05786 t      s         snas
wiley charles         prob officer      13173        s         ocol
```

The New Jersey municipal (traffic) courts file is a heavily-coded list of cases, also in an 80-character file. Its contents include:

FIELD CONTENTS	COLUMNS from - to
MUNICIPAL CODE	001 - 002
TICKET NUMBER	003 - 012
COMPLAINT	013 - 013
DATE OF COMPLAINT	014 - 019
ORIGINAL PLEA	020 - 020
ORIGINAL DATE	021 - 026
FINAL PLEA	027 - 027
FINAL DATE	028 - 033
CONTINUANCES	034 - 035
DATE OF TRIAL	036 - 041
LENGTH OF TRIAL	042 - 044
DISPOSITION	045 - 045
SENTENCE	046 - 047
COURT COSTS	052 - 053
DAYS IN JAIL	054 - 055
JUDGE'S NAME	062 - 073
APPEAL	075 - 075

Because the file is coded, no examples are presented. Without the de-coding sheets a sample of the New Jersey file would look like gibberish.

APPENDIX 2

TECHNICAL DATA

CONRES is a highly compatible modular program consisting of 32 subroutines called by a main program. Written in FORTRAN IV (G) it will be accepted by WATFOR compilers, although the slower execution time is rarely worth the more rapid compilation. Currently being run on an IBM 370/145 at Boston University, it requires some 60,000 bytes to run.

Input/output units used most heavily are library files and the terminal (interactive read/write). It also requires, in current form, a permanent storage i/o unit accessible while on-line which is rewindable, a feature available on all major systems. The amount of file capacity required depends on the size of the user's data file and the extent of his usage of temporary work space.

CONRES features excellent flexibility in terms of hardware adaptation. The program converts to batch runs almost instantly, requiring only the preparation of suitable input cards and unit re-definition statements.

Several "holder" decks are available which allow sections of the system (each primary option) to be run independently of the entire CONRES system (not in object-deck form) as an aid in alteration and de-bugging.

Data file limitations have been set arbitrarily at 80 characters due to the inability of some computer file structures to handle 128 (or 255, as at Boston University) character records; CONRES can be adapted to fit larger records if desired.

CONRES is supported by NCSC. Adaptations, alterations, advice, and assistance are available.

END