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S T. PAUL CAMPUS COMPUTING NEWSLETTER

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University of Minnesota

26 North Hall
St. Paul Campus
373-0987 - 0990

ANNOUNCEMENTS

- a) We are pleased to announce that Francisco MacClure, a Ph.D. candidate in Animal Science, was recently appointed as a Senior Computer Programmer. Mr. MacClure has a heavy academic background in the field of statistics, with several years of practical experience in the analysis of data. He has considerable experience with the use of the statistical software and FORTRAN compilers of both the IBM 360 and CDC computer systems here at the University. Please feel free to contact him for application programming and statistical package consulting.
- b) A computer consultant is now on duty 5 days a week in the 1004 Terminal user room (room 24). This consultant should be able to assist users with most diagnostics, job card preparation, equipment operation and statistical packages setups.
- c) Bess Olson, former Assistant Key Punch Supervisor, recently resigned to take a position outside the University. We extend our thanks to her for her contributions to the Computing Center and wish her the best of luck in the future.

We are pleased to announce that Joann Kuester, who has 6½ years of experience in the key punch field, was promoted to fill this vacancy. Please contact either Joann Kuester or Mary Erickson, Key Punch Supervisor, for submitting or scheduling key punch work.
- d) June Billing Cutoff. The Computing Center will close its books on fiscal year 1973-1974 data processing activity at midnight, Friday, June 21, 1974. We will bill the departments that have utilized our services in June, on Monday, June 24th. In this manner, all business activity will be cleared before the fiscal year comes to an end. All chargeable services rendered after the cutoff will be processed at the end of July as fiscal 1974-1975 business.
- e) The Center places an open invitation to current and prospective users for requests related to the offering of information seminars on the programs of general interest and the types of services the Computing Center has to offer. This invitation includes providing tours of our facilities and demonstrations of equipment to any organized group or class. Interested users or groups should contact Mel Sauve for making the necessary arrangements.

KEY PUNCHING CONVENTIONS

In submitting punching jobs to our key punch section, it is best (speedier and less apt to err) if the following rules are adhered to:

- a) The letters 'I' and 'O' should be recorded as I and Ø
- b) The numbers one and zero should be recorded as 1 and 0
- c) Dashes or lines should not be used to indicate missing data or blank columns; instead its corresponding space should be left blank.

- d) When card corrections are indicated on the card itself, they should be written on the opposite end of the card.
- e) When possible it is desirable that 40 x 80 sheets (which can contain forty 80-column card images — available free of charge from the Center) be utilized for recording data. These sheets are large enough so data can be legibly recorded with adequate dimensions.
- f) FORTRAN programs should be coded on FORTRAN coding sheets when available.
- g) Data containing special characters, such as FORTRAN programs, which is to be run on the CDC equipment should be noted as such. By this, operators will be alerted to the need of using the 48-character punch codes that are compatible to the CDC equipment. Unless indicated otherwise, the 64-character punch codes (those common to the IBM 360 operation) will be assumed.

TIME GRANT ACCOUNTS (IBM 360)

All time grant accounts (those in the '2000' series) are automatically cancelled out at the end of each fiscal year. The cut-off for the use of 1973-74 time grant account numbers is midnight, June 21, 1974. The Center does not wish to discourage the use of its facilities, but must be assured that the time grant numbers are being used for the original purpose intended. Any-one requiring additional work on an existing time grant account or new work for which he feels a time grant is justified, should obtain the proper account request form from the main office in the Computing Center.

The Computing Center's time grant policy is to provide modest amounts of IBM 360 time in support of non-sponsored, unsupported research projects, for such user applications that have overrun funds available in budgetary allotments and for course related work. Although small amounts of Computer Programmer, Computer Operator and Key Punch Supervisor time and assistance are given in supporting such accounts, no production or long-term key punching or application programming is permitted. All requests are subject to the approval of the Computing Center's Data Processing Manager or Administrators.

INTRODUCTORY AND ORIENTATION SEMINAR

An introductory seminar for new and prospective users of the equipment and services available in the Computer Center is scheduled for Wednesday, June 12th from 3:05 to 4:30 p.m. Those wishing to attend this seminar should call or write Mrs. Eva Klein, 26 North Hall (373-0987), providing her with your name, department and telephone number.

The subject matter of the seminar will relate to the following topics:

Equipment

- a) IBM 360 model 30
- b) Univac 1004 terminal

- c) Teletype Terminal (MERITSS)
- d) Unit-record equipment (sorters, reproducers, etc.)
- e) Key punch equipment
- f) Miscellaneous equipment (copier, burster, decollator, etc.)

Services

- a) Application programming
- b) Computer programming consulting
- c) Key punching
- d) Unit-record and computer equipment operations
- e) Software available

Miscellaneous

- a) Card and paper supplies available
- b) Magnetic tape, card and printout storage facilities
- c) Open-shop operations
- d) Account numbers and cost of services
- e) Access to facilities and hours of work
- f) Tours, demonstrations and short courses available

STATISTICAL PROGRAM ORIENTATION SEMINAR

On Wednesday, June 19, the Computing Center will offer a computer program orientation seminar on the statistical programs that are available on the IBM 360 system.

Place: Room 6A North Hall (Lounge area)

Time: 3:05 to 4:30 p.m.

- Topics:
- a) All the statistical programs that are widely used will be discussed briefly.
 - b) The 'SP22' program (Correlation and Multiple Regression program) will be discussed in detail. This program highlights most of the features, conventions and options of the other general programs available on our system.

If you wish to attend this seminar, please call or write Mrs. Eva Klein, 26 North Hall (373-0987). Please provide her with your name, department, and telephone number.

LEAST SQUARES PROGRAM NOW AVAILABLE

A modified version of the Animal Science Least Squares Program for handling problems having unequal subclass numbers and/or missing data is now available on the IBM 360. The new version may be run completely from control cards, thus FORTRAN programming is not required. Some of the program features and options are listed below (additional features are being implemented and tested for a new version to be released later). For very large problems, the Animal Science version is available for use on the CYBER 74.

Program Features and Options

- a) provides optional printout of the following:
 - 1) augmented X' X matrix
 - 2) augmented sums of squares and cross product matrix
 - 3) variance-covariance matrix
 - 4) correlation matrix
 - 5) inverse of the correlation matrix
 - 6) identity matrix
 - 7) inverse of the variance-covariance matrix

- b) provides means and standard deviations for each subclass for all dependent variables and covariables
- c) provides a summary of the design variables with the corresponding number of observations for each cell
- d) provides polynomial comparisons for main effects (linear, quadratic, etc.) and provides any other comparison that the user specifies
- e) provides least squares estimates with standard errors and t values for main effects, interactions and covariables
- f) provides an analysis of variance table for each dependent variable for the sources of variation specified by the user
- g) allows up to 25 transformations

The documentation for setting up this program is not completed yet. Those wishing to use the program should see Mr. MacClure for assistance.

TECHNICAL TIP

From our observation internal in-core array sorting is widely used by many FORTRAN programs. The FORTRAN subroutine labeled 'Method 1 (Shellsort Algorithm)' listed below demonstrates a very fast method of sorting moderate to large sized arrays. This method is called the 'Shellsort' method and was originally published in the 'Communication of the ACM (Association for Computing Machinery)' in August, 1963. The method labeled 'Method 2 (conventional sort)' as listed below is the method commonly used in FORTRAN programming.

Method 1 (Shellsort Algorithm)

```

SUBROUTINE SHSORT (K, A)
  DIMENSION A(K)
  I = 1
10  I = I + 1
   IF (I.LE.K) GO TO 10
   M = I - 1
20  M = M / 2
   IF (M.EQ.0) RETURN
   L = K - M
   DO 40 J = 1, L
     I = J + M
     DO 30 J1 = 1, J, M
       AIM = A(I)
       I = I - M
       IF (AIM.GE. A(I)) GO TO 40
       A (I + M) = A(I)
       A (I) = AIM
30  CONTINUE
40  CONTINUE
   GO TO 20
END

```

Method 2 (Conventional Sort)

```

SUBROUTINE CNSORT (K, A)
  DIMENSION A(K)
  N = K - 1
  DO 100 I = 1, K
    DO 100 J = 1, N
      IF (A (J) - A (J + 1)) 100, 100, 10
10  TEMP = A (J)
   A (J) = A (J + 1)
   A (J + 1) = TEMP
100 CONTINUE
  RETURN
END

```

Computer Center programmers have tested and obtained sort timings on both the IBM 360 and the CYBER 74 systems for both sort methods. The ratio in speeds between both methods as tested on both computers is almost the same. Tabulated below are our findings for various array sizes. The sorts were tested on both ascending and descending order of values in the initial arrays. The number shown under the Shellsort Method is represented as a factor of how many times faster it is compared to the conventional sort method.

INITIAL ORDER	NUMBER OF ELEMENTS IN THE ARRAY	SHELLSORT METHOD IS FASTER BY
Descending	100	6
Ascending	100	7
Descending	250	11
Ascending	250	14
Descending	500	21
Ascending	500	26
Descending	1000	37
Ascending	1000	44
Descending	2500	84
Ascending	2500	95
Descending	5000	155
Ascending	5000	173

MINNESOTA ANALYSIS AND PLANNING SYSTEM (MAPS)

MAPS USERS SEMINAR

The MAPS Users Seminar will be from 9:00 a.m. to 4:30 p.m. on June 4, 1974, in 401 Coffey Hall. The user may schedule additional consultation time with an appropriate MAPS staff member to learn about MAPS and its services in meeting specific needs.

The users seminar is a shortcourse to acquaint both current and potential MAPS clientele with our data base and services. The seminar is led by MAPS staff members David Nelson and Tim Engel in an informal atmosphere.

The morning will be used to acquaint participants with the general background of MAPS and the 1970 Census. The census data, its organization, and its availability are discussed. Sample output is provided from actual client usage. Participants are encouraged to ask questions of specific interest.

The afternoon will be used to acquaint participants with the supporting services that MAPS is able to provide. Information systems and data processing are given general descriptions. The MAPS library of data files, other than census files, is described and is used to introduce Qwick Query as a usable data information and retrieval system. The potential use of Qwick Query is described.

The general intent of the seminar is to bring the participant to the point of taking full advantage of the services and data that can be provided by MAPS.

XEROX COPY SERVICE

Copy your computer printout at MAPS. Facilities allow continuous feed of printout. Do not burst. 8½ x 11 inch copies are available from the 11 x 15 inch printouts. Charges are 2 to 3 cents per copy with a \$1 minimum charge.

FEDERAL DATA FILES AND RELATED SOFTWARE

The 1974 directory of computerized federal data files and related software has been acquired. Data and files available for public release are described. MAPS will serve as a resource to meet your needs for federal data and information.

MAPS CASEBOOK

The MAPS Casebook is now available. It communicates information about actual use of MAPS data bases and computer related service capabilities. Each case represents an actual project in which MAPS was involved with a client. Contact the MAPS Office (376-7003) to order.

CLASSROOM OFFICE BUILDING COMPUTING FACILITIES

After considerable trouble last quarter with the card reader on the 1004, operations have been much smoother this quarter. New procedures that have been established for reporting problems should help maintain reliable service. In addition, the 026 keypunch has been replaced by a better one.

A consultant is on duty in the MERITSS lab (125E) and 1004 room (125G) during the following hours (except for a few isolated periods in the middle of the day):

Monday and Friday: 8:00 a.m. – 6:00 p.m.
 Tuesday, Thursday: 8:30 a.m. – 6:00 p.m.
 Wednesday: 8:00 a.m. – 8:00 p.m.
 Saturday: 9:00 a.m. – 12:00 noon

Statistics computing consultants are on duty in 125E according to the following schedule:

Monday and Friday: 1:00 – 3:00 SKL; 3:00 – 5:00 DJ
 Tuesday, Thursday: 9:00 – 12:00 LJ; 12:30 – 3:30 LT
 Wednesday: 3:00 – 5:00 DJ

The consultants, S. K. Lee (SKL), D. Jacobson (DJ), L. Thibodeau (LT), and L. Johnson (LJ), are statistics graduate students. The consultants are prepared to give advice on the selection and use of standard statistics computer programs such as SPSS, OMNITAB, BMD, ISIS, and IMSL, interpret manuals and output, and trouble shoot on the preparation of data and control cards.

GENERAL INFORMATION OF COMPUTING EQUIPMENT BY LOCATION

Equipment Type	Location	Key Staff Personnel	Hours of Service	Telephone
IBM 360/30 computer	22 North Hall	Dave Schempp (consultant)	7:45 a.m.—4:30 p.m.	373-0987
		Operations staff	7:00 a.m.—Midnight	373-0990
		Key punch supervisors	7:00 a.m.—5:00 p.m.	373-0992
		Account clerk	7:45 a.m.—4:30 p.m.	373-0990
Univac 1004 terminal	24 North Hall	Jim Colten (consultant)	7:45 a.m.—4:30 p.m.	373-0987
		Operations staff	7:00 a.m.—Midnight	373-0990
CDC 200 terminal	415 Coffey Hall	Dave Nelson	7:45 a.m.—9:30 p.m.	376-7003
		Tom Ehlen	7:45 a.m.—9:30 p.m.	376-7003
		Elaine Greenfield (principal secretary)	7:45 a.m.—4:30 p.m.	376-7003
			(after hours use by arrangement)	
Univac 1004 terminal	125G Classroom Office Building	Consultant	8:00 a.m.—6:00 p.m. Mon, Fri	376-7087
		L. Viemeister	8:30 a.m.—6:00 p.m. Tues, Thu	373-1037
		C. Bingham	8:00 a.m.—8:00 p.m. Wed	373-0988
			9:00 a.m.—12:00 Noon, Sat	
Interactive instructional lab	125E Classroom Office Building	Consultant	8:00 a.m.—6:00 p.m. Mon, Fri	373-0829
		L. Viemeister	8:30 a.m.—6:00 p.m. Tues, Thu	373-1037
		C. Bingham	8:00 a.m.—8:00 p.m. Wed	373-0988
			9:00 a.m.—12:00 Noon, Sat	
Hewlet-Packard 9100B	125A Classroom Office Building	L. Viemeister	By arrangement	373-1037
Univac 1004 terminal	257 Biological Science	Howard Meyer (consultant)	8:30 a.m.—4:30 p.m.	376-3067

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