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Computer Center News Letter / October 10, 1980

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Computer Center

News Letter

NAVAL POSTGRADUATE SCHOOL
MONTEREY, CALIFORNIA



October 6, 1980
Volume 12, No. 7

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INSTALLATION OF THE NEW COMPUTER

The new computer system, an IBM 3033 Attached Processor configuration, will be installed during the Christmas break. Service on the IBM 360/67 will be discontinued at 4:30 p.m. on Friday, December 5, 1980. (This will mark the end of almost 14 years of the "67", initially in Spanagel Hall, then from 1969 in Ingersoll Hall.) Users are warned not to expect any computer service from the end of the tenth week of the fall quarter until the beginning of the winter quarter on January 5, 1981. We ask all users to plan their computing accordingly. Please get your work done as early as possible this quarter.

Major hardware features of the new system are an IBM 3033 processor coupled with an IBM 3042 attached processor, sharing 16 MBytes of processor storage. Auxiliary storage includes IBM 3350 disks (317.5 MBytes per drive) and an IBM 3851 mass storage facility which houses removable cartridges of 50 MBytes each. Two IBM 2305-2 drums with 12 MBytes each will be the primary

paging devices for operating under Virtual Machine (VM)/370. The initial configuration includes approximately 100 IBM 3278-2 display stations, eventually to be installed in clusters in the academic buildings. Initially, most of these will be installed in Ingersoll Hall, and be moved to their final locations as work on the trenching and cable-laying progresses.

To install in December, we will have to utilize temporary power and chilled-water sources. All of the planned environmental work and associated construction will not be completed until June 1981. The switchover from the temporary to the permanent power and cooling systems is planned for the summer break.

In the next few weeks the Computer Center will be distributing more information on the system, special classes, conversion guides, etc.

USER SERVICES TALKS FOR FALL QUARTER

Five talks will be offered during this quarter to assist users of both of our operating systems. If you are interested in attending a session, insure yourself of a seat by signing up on the appropriate sheet posted in In-146, the Consulting Office. Please do so at least 48 hours before the scheduled time. Then we can let you know if there is any change in the schedule.

1.

INTRODUCTION TO CP/CMS
Tuesday, October 14 at 1510, In-119
Speaker: Joanne Bogart

Topics to be covered include: log-on procedures, types of users, system modes or environments; use of the editor; entering, editing, compiling and running a Fortran program; rudimentary debugging at the terminal and miscellaneous handy commands. This talk is intended for the beginner.

Note: This talk will be repeated on Wednesday, October 29, same time and place.

2.

INTRODUCTION TO SPSS
Wednesday, October 15 at 1510, In-119
Speaker: Dennis Mar

The speaker will describe the Statistical Programs for the Social Sciences and show how it can be used for almost any statistical problem. Topics include general problems of data analysis, measurement, and efficiency hints. Examples of actual usage, including required job control language, will be shown. This talk is intended for any user who wants to use SPSS on our system.

JOB CONTROL LANGUAGE AND SPSS
Thursday, October 16 at 1510, In-119
Speaker: Dennis Mar

The job control language (JCL) necessary for constructing SPSS system files on the public disks will be described in detail. The use of disk utilities

will be illustrated. The talk will trace the internal execution of an SPSS program. Common difficulties with data transformations or with large data sets will be pointed out. Previous experience with SPSS will be helpful for the understanding of the talk.

4. INTRODUCTION TO JOB CONTROL LANGUAGE
 Tuesday, October 28 at 1510, In-119
 Speaker: Jane Foust

This talk deals with the various types of job control statements, their purposes and formats. It is intended for anyone who wants to understand the relationship between job control language, the user's program and the operating system (OS/MVT).

5. INTRODUCTION TO CP/CMS
 Wednesday, October 29 at 1510, In-119
 Speaker: Roger Hilleary

This is a repeat of the first talk described above.

EDITION 8 of the IMSL LIBRARY ANNOUNCED

(The following is extracted from a Product Announcement release by International Mathematical and Statistical Libraries, Inc., otherwise known as IMSL.)

Edition 8 consists of 485 subroutines covering almost all the basic calculations involved in applied mathematics and statistics. Forty-one new routines have been added and four previous ones (from Edition 7) have been deleted. The four, all in the random number generator chapter, are:

GGAMS - replaced by GGAMR	GGBIR - replaced by GGBM
GGAMT - replaced by GGAMR	GGMLT - replaced by GGMTN

Highlights of Edition 8 are:

Exploratory Data Analysis

Four new routines implementing some of the techniques of exploratory data analysis have been added to the Library. Two of these routines are in Chapter B. One routine does median polish of a two-way table; the other produces "letter value" summaries. A new routine in Chapter U produces stem and leaf plots. Another new routine in Chapter U yields boxplots of one to several samples on a single set of axes. The output from this latter routine allows easy comparison of the samples and also provides clear indication of the dispersion characteristics of each sample.

Categorized Data Analysis

Abilities for log linear model analysis have been provided in a new routine that does iterative proportional fitting. Another new routine computes exact probabilities for two-way tables. This latter routine supplements the existing routine CTRBYC.

Differential Equations

A subroutine which solves differential equation systems with two-point boundary conditions has been added. This routine utilizes a multiple shooting technique, using IMSL initial value routine DVERK to solve the differential equations each "shot." Another new routine calculates double integrals, using DCADRE to calculate each simple integral.

Eigensystem Analysis

A code to find eigenvalues and eigenvectors of band symmetric matrices is included in Edition 8. The existing routines for real symmetric and complex Hermitian matrices have also been extended to allow input in full storage mode.

Transforms

New routines include an inverse Laplace transform code and a subroutine which calculates fast Fourier transforms of two- and three-dimensional arrays.

Random Number Generation

Ten new routines have been added to Chapter G in the Library. GGUO and GGNO are routines to generate order statistics from a uniform and a normal distribution, respectively. Any set of order statistics from the i -th to the j -th from a given sample size may be generated. Two other new routines are for generation of variates from a nonhomogeneous Poisson process using an efficient thinning method devised by IMSL Advisor and NPS Professor P. A. W. Lewis. Another basic uniform generator has been added to the Library for the user who would prefer an alternate multiplier. The shuffled generator GGUV has been modified so the user may call it from any subroutine in the chapter if it is desired to perform shuffling prior to generation of non-uniform variates. A routine for generation of discrete uniform deviates, as well as two routines for generation of variates from general discrete distributions, has been provided. One of the general routines uses a table lookup method and the other uses the alias method. In addition to the new routines added, the efficiencies of the current routines for generation of gamma, beta, and multinomial variates have been substantially improved.

Interpolation, Approximation, Smoothing

Featured additions are easy-to-use companions to the existing cubic spline interpolation and smoothing subroutines. The easy-to-use interpolatory spline routine achieves high accuracy without requiring user-supplied end conditions, while the easy-to-use smoothing spline routine uses statistical considerations to determine the degree of smoothing needed. The latter subroutine is based on work by Grace Wahba, F. Utreras Diaz and Paul Merz. Additional one-dimensional approximation subroutines calculate a cubic spline interpolant with periodic end conditions and a least squares approximation using user-supplied basis functions. Two-dimensional advances include a new code by H. Akima which fits a smooth surface to data given at irregularly spaced

points (x_1, y_1) and modifications to all the bicubic spline routines so they use C. de Boor's "not-a-knot" boundary conditions rather than the less accurate "natural" boundary conditions.

Linear Algebraic Equations

Two new subroutines have been added to Chapter L for Edition 8. LLBQF computes high accuracy solutions to linear least squares problems. The routine is based on an algorithm developed by Ake Bjorck.

LGINF, a subroutine to compute the generalized inverse of a matrix, has also been added to Chapter L.

Probability Density and Distribution Functions

Two new routines in Chapter M allow evaluation of a general continuous distribution function or its inverse, using a table of values of the density function. A new routine has been added to Chapter N for nonparametric estimation of the density function using the kernel method.

Regression Analysis

Edition 8 allows two useful alternatives to least squares estimation in regression models. The new routine RLLAV performs an L_1 or least absolute values fit of a linear model, and a second new routine RLLMV computes an L_∞ or minimum maximum deviation fit.

Zeros and Extrema; Linear Programming

A more robust nonlinear equation solver ZSCNT has been added which should be used instead of ZSYSTEM for all new applications. ZSYSTEM will be deleted for Edition 9. A new linear programming routine, based on R. J. Hanson's work, has been added which may eventually replace ZX3LP and ZXOLP. This subroutine ZX4LP is expected to handle large problems with greater reliability. User comparisons between ZX3LP and ZX4LP are invited.

IMSL EDITION 8 INSTALLED AT NPS

Edition 8 (described above) is now the default version of the IMSL library at NPS. Use of the IMSL libraries remains the same as for the previous edition. The user of any standard Fortran cataloged procedure (e.g. FORTCLG) will automatically access the single precision IMSL library. To access the double precision IMSL library, the user must code IMSL=DP on the EXEC card invoking the procedure.

The Edition 7 compiled libraries may be accessed by coding IMSL=SP7 or IMSL=DP7 on the EXEC card. However, these libraries will be available only until the end of this quarter. Users who wish to continue using any of the above mentioned deleted routines beyond 1980 must obtain personal copies of the routines. See the IMSL library directory in In-146 for instructions on obtaining a source code deck of a given IMSL routine. Users should make every possible effort to convert their programs to the

new subroutines which replace the deleted routines. Any difficulty experienced in converting these routines should be brought to the attention of Jane Foust, In-103, ext. 2696.

FORTRAN G/FORTRAN H-EXTENDED COMPATIBILITY

It is important to be sure the Fortran H-Extended subroutine library is used by the linkage editor when processing Fortran HX routines or a mixture of Fortran HX and Fortran G routines. If you attempt to link routines compiled in Fortran HX with the library routines in SYS1.FORTLIB, you will usually see IHC220I error (unit number out of range) at execution time. To avoid these problems, simply use the LGOX cataloged procedure to process Fortran HX object modules or any mixture of Fortran HX and Fortran G object modules. In these cases, avoid use of the LGO cataloged procedure.

RECENT ADDITIONS TO THE COMPUTER CENTER LIBRARY

Books

<u>Author</u>	<u>Title</u>
Martin, James	Communications Satellite Systems
Wegner, Peter	Programming with ADA
Walker, Henry M.	Problems for Computer Solutions Using Fortran
Zaks, R. and Lesea, A.	Microprocessor Interfacing Techniques
Horowitz, E. and Sahni, S.	Fundamentals of Data Structures
Calingaert, Peter	Assemblers, Compilers and Program Translation
Ullman, Jeffrey D.	Principles of Database Systems
Moore, Ramon E.	Methods and Applications of Interval Analysis
Winograd, Shmuel	Arithmetic Complexity of Computations
Hartmanis, Juris	Feasible Computations and Provable Complexity Properties
Manna, Zohar	Integer Programming

The Newsletter appears semiquarterly and is written by members of the staff, W. R. Church Computer Center (Code 0141), Naval Postgraduate School, Monterey, California 93940. Requests for further information or suggestions for articles for the Newsletter may be addressed to the User Services Manager, Code 0141 (In-133), ext. 2752 (or ext. 2573 for messages).

The Center provides batch-processing service under IBM 360/OS (OS/MVT/HASP, Release 21.8) and time-sharing service under CP-67/CMS, Version 3.2. These services are based on a dual-processor IBM 360 Model 67 system with 2.0 megabytes of core storage.

Distribution

List 3, plus: 1-A5, 125-B2, 3-B3, 1-B13, 3-F3, 1-F4, 1-F5, 1-F6, 60-Student Mail Center (Lobby), 100-Computer Center