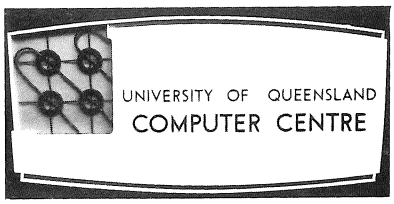

COMPUTER CENTRE BULLETIN

Vol. 4, No. 12
6 December 1971

Editor:
Mrs Sarah Barry

CHANGE OF POLICY ON BULLETIN MAILING LIST

In past years the Bulletin has been distributed according to two mailing lists; one for organizations and departments, which is permanent, and the other for individuals, which is maintained on an annual basis.

Unfortunately, however, many organizations and departments have omitted to inform us when they no longer require the Bulletin. Consequently the Centre is continuing to supply the journal at considerable expense, to users who may not necessarily be interested in receiving it.

To overcome this problem, future distribution of the Bulletin will be on an annual basis for all users. Accordingly, existing mailing lists will be cancelled at the end of this year, and organizations, departments, and individuals wishing to receive volume 5 are requested to complete and return the enclosed form on page 187.

CHRISTMAS SHUT DOWN

The Computer Centre will shut down on Christmas Eve and remain closed during the intervening days between Christmas and New Year. No further work will be processed after 11.30 p.m. on Thursday 23 December. However, the Centre will remain open until 1 p.m. on Friday 24 December to allow staff to finalize end-of-year accounting and users to collect any work or card punching. The Centre will re-open at 9 a.m. on Tuesday 4 January 1972.

COMPUTER CENTRE COURSES AND SEMINARS

During February 1972, the Computer Centre will conduct a number of courses and seminars. A schedule of these, together with a brief outline of each, is set out below. A complete schedule of Computer Centre courses for 1972 will be published at a later date when lecture room availability and allocation for the year becomes known.

1. DIFFERENCES BETWEEN COURSES AND SEMINARS

(a) Courses

A course comprises two or more half-day sessions and is intended to instruct students in a given topic at a fairly detailed level. The presentation of the topic is relatively formal and most courses contain practical work. Details of available courses will be published well in advance, and enrolments must be made on the form 'Nomination for Computer Course'. These forms can be obtained from the Computer Centre Secretary. A fee is payable for all courses, and includes machine time used on practical work.

(b) Seminars

Seminars, on the other hand, are fairly short (one or two hours) and deal with a specific topic of general interest, or give details of new services and facilities. While as much advance notice as possible will be given, there will be no attempt to publish a complete schedule of seminars for a year. No charge is made for seminars, and formal enrolment is not required.

2. COURSES IN FEBRUARY 1972

(a) Introductory FORTRAN Programming

FORTRAN (Formula Translation) is a programming language which allows the computer user to express his calculations in a mathematical type of notation. The Introductory FORTRAN Programming course assumes that the student has no prior knowledge of either computers or programming. This course covers some computer concepts, basic FORTRAN programming, and includes several exercises which are run on the PDP-10 computer.

Course duration: five half days

Course fee : University personnel $20; Others $40

Prerequisites : None

(b) Introduction to Dynamic Debugging Technique

DDT (Dynamic Debugging Technique), available to remote terminal users of the PDP-10, is a powerful facility which greatly assists in the testing and debugging of programs. This short course introduces DDT and its uses to the FORTRAN programmer, and provides some practical experience.

Course duration: two half days

Course fee : University personnel $8; Others $16

Prerequisites : Experience in FORTRAN and use of remote terminals.

3. SEMINARS IN FEBRUARY 1972

(a) Computer Centre Facilities and Services

A general description of the facilities and services provided by the Computer Centre.

(b) Use of Remote Terminals

An introduction to the use of remote terminals on the PDP-10 and the facilities available to the remote terminal user.

(c) The Digital Plotter

This seminar describes the digital plotter on the PDP-10 and discusses its operation, uses and the range of available plotter software.

(d) The Student Accounting System

The student accounting system allows large numbers of small programs (such as those written by undergraduate practical or laboratory classes) to be grouped together and processed quickly and cheaply as one job on a single project number. The class tutor or supervisor can set a cost limit for each student job in the group. The output for each student is identified by name, and the system provides the class supervisor with accounting details for each student.

(e) Absolute Overlays

The absolute overlay facility available on the PDP-10 allows a large program (exceeding the available memory space) to be segmented and run in a small memory space. This seminar describes the use of absolute overlays.

The schedule of courses and seminars is shown on page 172.

COMPUTER CENTRE MANUALS

This year, Computer Centre manuals, coding sheets, flow charts, templates, etc. have been sold through the University Bookshop. However, in view of the growing number of manuals and the difficulties in maintaining the revision status of these publications, it has been decided that this material will be sold directly in the Computer Centre from 4 January 1972.

A revised list of manuals and supplies including prices for 1972 follows:

MANUALS

MNT-5		FORTRAN	$1-50
MNT-6		EDITOR	$0-80
MNT-8		SYSTEM USER'S GUIDE	$3-60
MNT-9		BASIC	$2-40
MNT-10		AID	$3-00
MNT-12	§1,2	OVERLAYS AND PLOTTER	$0-90
	§3	DDT-10	$1-30

SUPPLIES

CODING SHEETS	$0-50
FLOWCHART TEMPLATES	$1-00
H.S.P. BINDERS	$1-10

SCHEDULE FOR FEBRUARY 1972

Date	Commence Time	Title	Type	Location	Course Duration	Course fee		Nomination Closing Date
						Univ.	Other	
1.2.72	10 a.m.	Computer Centre Facilities and Services	Seminar	B18 Engin.				
3.2.72	10 a.m.	Use of Remote Terminals	Seminar	B18 Engin.				
7.2.72	9 a.m.	Introductory FORTRAN Programming	Course	B18 Engin.	9 a.m. - 1 p.m. 7.2.72 - 11.2.72	$20	$40	31.1.72
21.2.72	10 a.m.	Use of Remote Terminals	Seminar	B18 Engin.				
22.2.72	10 a.m.	The Digital Plotter	Seminar	B18 Engin.				
23.2.72	10 a.m.	The Student Accounting System	Seminar	B18 Engin.				
24.2.72	10 a.m.	Absolute Overlays	Seminar	B18 Engin.				
24.2.72	2 p.m.	Introduction to Dynamic Debugging Technique	Course	B18 Engin.	2 p.m. - 5 p.m. 24.2.72 - 25.2.72	$8	$16	17.2.72

In order to ensure that adequate stocks of all manuals are available for the beginning of first term next year, the Centre requests that all University staff members giving courses with some computing content advise the Centre, as soon as possible, of the course, anticipated number of students next year, and the manuals which will be required in that course. For your convenience the form on page 185 should be completed and returned to Mrs Sarah Barry at the Computer Centre.

PDP-10 RANDOM AND SEQUENTIAL FILE ACCESS

[WN-62]

Users should not attempt to mix random and sequential modes of access for the same file in a FORTRAN program. The following rules for reading and writing FORTRAN files should be observed.

(a) A logical unit may not be used for sequential and then random input/output in the same program unless an intervening CALL to RELEASE is issued. For example, if sequential input/output is done to unit 10, then random input/output to unit 10 is illegal and will fail.

(b) Before random input/output is performed through a READ or WRITE statement, the file must be properly defined through a DEFINE FILE.

(c) CALLs to IFILE or OFILE open files for sequential input/output. They must not be issued for logical units to be used for random input/output. If it is desired to open a file for sequential input/output on a unit that has been used for random input/output, a CALL to RELEASE must be issued before a CALL to IFILE or OFILE.

ENCODE/DECODE SYNTAX RESTRICTIONS

[WN-62]

The number of characters specified in ENCODE or DECODE statements may be an integer variable or an integer constant but not an expression. For example;

```
ENCODE(2Ø,1Ø,A) I,J,K
DECODE(N,4Ø,A) X,Y
```

are acceptable provided statement numbers 10 and 40 are legal format statements.

The following statement produces a compilation error:

```
********              ENCODE(K*J,1Ø,A) I,JK
********                       ↑
********             S-1 SYNTAX
```

Note also that a similar restriction applies to logical device numbers in READ and WRITE statements.

PDP-10 FORTRAN ERROR

[WN-65]

An error has been detected in the routine used to print asterisks when an output field width is too small. Instead of incrementing the count of errors it adds one to a location which is usually a user program instruction. The effects are unpredictable and usually not noticed. Until this is fixed any program which gives the 'OUTPUT FIELD WIDTH OVERFLOW' message must be suspect. The use of G type format specification is recommended to avoid this situation.

COGO

[WN-64]

A new version of COGO (Coordinate Geometry program) has been implemented on the PDP-10. The Main Roads Department has developed this package for the PDP-10 and has made it available to the University for general use. Complete documentation on this program can be obtained from the Computer Branch, Main Roads Department.

LINE PRINTER SYMBIONT

[WN-65]

A new version of the line printer symbiont program has been implemented. Most of the changes are not apparent to the user except for the implementation of the argument ALL. A user can now specify ALL as either the name, processor program name or both, in order to list a group of files with the one command.

example:

```
LIST ALL/F4, PROGR/ALL
```

LIBRARY ACCESSIONS

BRIGHTMAN, Richard W. — *Information systems for modern management* 1971 (HF5548.2.B758 Main)

ADAMS, J. Mack — *An introduction to computer science* 1970 (651.8 ADA Engin.)

\- — *All about minicomputers* 1970 (QtoQA76.A5 Main)

WATSON, Richard W. — *Timesharing system design concepts* 1970 (651.8 WAT Engin.)

CONFERENCE ON COMPUTATIONAL PHYSICS, 2nd LONDON 1970 — *Computational physics* 1970 (QC20.2.C6 Phys.)

SHULMAN, Arnold Roy	*Optical data processing* 1970 (535.02462 SHU Elect.)
GREENBERG, Harold	*Integer programming* 1971 (519.9 GRE Maths)
McMILLAN, Claude	*Mathematical programming* 1970 (T57.7.M35 Main)

PLOTTING AND REGRESSION PROGRAMS

Mr Whiten, from the Department of Mining and Metallurgical Engineerin, has kindly offered the use of the following programs should any Computer Centre users be interested.

(a) A FORTRAN subroutine for plotting on the line printer.

(b) A multiple spline regression program as described in 'The Use of Multi-Dimensional Cubic Spline Function for Regression and Smoothing' Australian Computer Journal, May 1972.

A brief description of these programs follows.

GRAPH PLOTTING ON THE LINE PRINTER

This subroutine is in the file 94.LPPLOT/REL and its calling sequence is:

```
CALL PLOTG(N,X,Y,LX,LY)
```

where the arguments are

N number of data points

X an array containing x coordinates of the points to be plotted

Y an array containing the corresponding y coordinates of the points to be plotted

LX length of the x scale in inches (10 is normal)

LY length of the y scale in inches (8 is normal).

The graph is printed starting on a new page. A title if required may be printed under the graph. Overlapping prints are printed as a count until 10 and then a $ is printed. The cost per graph is about 25 cents.

THE MULTIPLE SPLINE REGRESSION PROGRAM

The multiple spline regression program consists of three separate passes each with its own data. Scratch files are used to pass the data values between these passes. Each pass can be run separately if desired.

PASS I

This is the input pass. A listing of the data and the distribution of each variable is printed. An option exists for transforming the data using the subroutine TRANS.

The input data is as follows:

(a) A problem heading - 75 characters
FORMAT (15A5)

(b) The number of raw variables and the number of transformed variables in fields of 5 characters (right justified). Neither value can be greater than 10.
FORMAT (2I5)

(c) The 5 character alphabetic names for the transformed variables. The names start in the following columns 6, 13, 20, 27, 34, 41, 48, 55, 62 and 69.
FORMAT (5X, 10(A5,2X))

(d) The data point name (columns 1 to 5) and the data values for each data point in fields 7 characters wide starting from column 6. One card is used for each data point and the end of the input marks the last data point. The data values are best scaled to be in the approximate range 1 to 1000.
FORMAT (A5, 10F7.0/(F12.0, 9F7.0))

Sample data

SAMPLE DATA 19/3/71

	4 X VAL	4 Y VAL	Z VAL	WT
T1	1.2	1.62	25.	1.0
T2	1.1	1.84	29.	1.5
T3	2.4	1.59	31.	2.0
T4	2.1	1.85	37.	1.0

PASS II

This pass applies spline transformations to single variables as specified in the input cards. The data is read from a scratch file and the transformed data is written onto a second scratch file.

The input data is as follows:

(a) The names of variables to go onto the output scratch file without change. The names start in columns 6, 13, 20, 27, 34, 41, 48, 55, 62 and 69. A blank field marks the end of these names.
FORMAT (5X, 10(A5, 2X))

(b) (i) The name of the variable (column 1) to undergo spline transformation, the number of knots (right justified columns 6 - 10), and the word PERIODIC from column 13 if a periodic spline function is required.
FORMAT (A5, I5, 2X, A5)

(ii) The x values of the spline knots in fields of 7 characters starting in column 6.
FORMAT (5X, 10F7.0)

The data in (b) can be repeated as required until 50 values have been specified for the output scratch file.

Sample data

```
     Z VAL  WT
X VAL    3
     1.0    1.75   2.5
Y VAL    3  PERIODIC
     1.6    .17    1.8
```

PASS III

This pass converts the one dimensional transformations of pass II to multidimensional functions, performs the regression, and prints the results.

The input data is as follows:

(a) The name of the dependent variable (column 6) and the name of the weighting variable if any (column 13)
FORMAT (5X, A5, 2X, A5)

(b) The independent variables. First a type code - 5 blank spaces for the sum of variables and/or one dimensional spline functions, or PRODb for the product of spline functions. Then the names of the variables starting in columns 6, 13, 20, 27, 34, 41, 48, 55, 62 and 69. This card type may be repeated as required to obtain a sum of product functions. Up to 64 function values can be calculated.
FORMAT (A5, 10(A5, 2X))

(c) END starting in column 1. MATRIX starting in column 6 if the Cholesky reduced regression matrix is required.
FORMAT (A5, A5)

The complete regression description ((a) to (c) above) may be repeated as often as required.

Sample data

```
     Z VAL  WT
     X VAL  Y VAL
END  MATRIX
     Z VAL
PROD X VAL  Y VAL
END
```

The first half of the data specifies a regression equation to predict Z VAL as a sum of spline fraction X VAL and Y VAL using WT as a weighting function. In the second half Z VAL is predicted using a two dimensional (product) function of X VAL and Y VAL.

The deck setup for the PDP-10 computer is:

```
.JOB - - -
.RUN 94.MSRI, 94.TRANS
      }
      }  Pass I data
file separator card
.RUN 94.MSRII
      }
      }  Pass II data
file separator card
.RUN 94.MSRIII
      }
      }  Pass III data
file separator card
.EOJ
```

The file 94.TRANS contains a no transformation subroutine. To make transformations other than spline a transformation subroutine must be written and loaded instead of 94.TRANS. In this case the transformations are made card by card using a subroutine starting as follows:

```
SUBROUTINE TRANS(NRV,NV,CODE,D)
REAL D(10)
```

The arguments are:

NRV	number of raw variables
NV	number of transformed variables
CODE	the 5 character data set code
D	a ten element array containing the data values.

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REQUEST FOR COMPUTER MANUALS AND COMPUTING SUPPLIES

DEPARTMENT: _____

COURSE: _____

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DATE OF COMMENCEMENT OF COURSE: _____

ANTICIPATED ENROLMENTS: _____

MANUALS REQUIRED FOR COURSE: _____

_____

_____

_____

COMPUTING SUPPLIES: _____

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Please complete this form and return it to:

The Technical Writer,
Computer Centre,
University of Queensland,
St Lucia 4067.

Additional forms are available from the computer Centre upon request.

BULLETIN MAILING LIST

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The Editor,
Computer Centre Bulletin,
Computer Centre,
University of Queensland,
St Lucia, 4067.

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