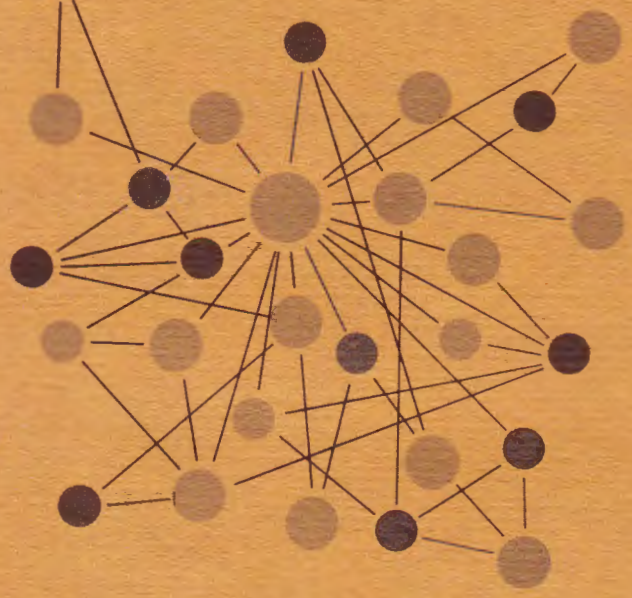
NEWSLETTER

SIMON FRASER UNIVERSITY COMPUTING CENTRE VOLUME 1 NUMBER 4 MAY – JUNE, 1970



Published by Academic Systems,
For the Computing Centre.
Miss Elizabeth Ward, Editor

COMPUTER CARTOGRAPHY AT SIMON FRASER

Until very recently, maps have been produced manually by cartographers who have developed quite a routine to make pleasing maps of different types. This situation is changing now as the computer can take over a large part of the repetitious work from the draftsman.

There are about a dozen programs for the description and analysis of two-and-three-dimensional phenomena available at the Computing Centre and/or the Department of Geography. They serve quick and thorough study of spatially (or in more general terms, two-dimensionally) distributed values. To show what one can do with these programs and what some of their implications and problems are, the SYMAP-group of mapping and surface-analysis programs created by the Laboratory for Computer Graphics and Spatial Analysis at Harvard University will be presented in more detail.

SYMAP (for SYnagraphic MAPping) is a descriptive program of high flexibility. Several different types of maps can be produced, the contour-map and the choropleth map being the most frequent ones. Different types of legends (names, streets, lakes, etc.) can easily be added and the scale may be changed by inserting just and option card. The line printer is used as the output device. Oversize maps can be produced by printing on several sheets and putting them together later. By interpolating between irregularly spaced 'data points' a continuous surface is construted and then mapped by isolines. Different interpolation algorithms are available one of them computes a least-squares polynomial surface of order 1 through 6 (the so called response on trend surface).

The interpolation algorithm and the provision for legends, however, are time consuming and thus make

SYMAP relatively slow and expensive. To economise in time but preserve the ease of usage of SYMAP, a subset of its subroutines called GRID has been put together. GRID shows to be of great value for the analysis of surfaces which have already been interpolated and for the representation of gridded data.

Many people have difficulties in reading contour and other types of maps, though they are usually able to understand three-dimensional views of the phenomena. These can be plotted by SYMVU. This program accepts gridded data and draws lines along the rows, columns or diagonals of the grid. The graph in this newsletter shows a topographic map of Vancouver with transformed heights (still with some bugs in it). The program also allows the 'smoothing' of rugged surfaces for a better evaluation of prevailing trends. Hidden lines are removed which contribute greatly to the visual impression of the picture.

For a further analysis of a surface, it is often beneficial to know its specific characteristics, i.e. the location of peaks, pits, passes and ridge-lines. This is done by WATERSHED which also provides slope and exposition analysis.

Computer cartography will never be able to touch the position of the skilled draftsman. Only a small number of institutions are developing programs which do similar things to a draftsman, (we call this area "automated drafting"). At least up to now most of the computer maps are intermediate stages in ones research, graphical and geographical bases for further inquiries. The draftsman would be a too expensive and too slow tool for this purpose.

Computer cartography is still in a state of infancy and progress is rather slow. Factors which hamper the development are the small number of people with skills in cartography as well as in computer science, the little communication between them, the inavailability of hard- which is usually expensive. In comparison to this, SFU is very well off. An increasing number of faculty and students not only in Geography are getting interested in the area; we have quite good contacts with other institutions working in this field and we are not too badly off with hardware either.

Tom Peucker – Wolf Rase: Geography Department

MORE ON THE ACCOUNTING SYSTEM

The first phase of implementation of the Computing Centre accounting system has been completed with the issuing of ID Numbers to individual users and the assignment of project numbers on a departmental activity basis. Each user department may use as many project numbers as is felt necessary to monitor effectively their use of Computing Centre service. If a department does not wish to differentiate between different types of activities by faculty members and/or support staff a general purpose (GPP)[1] project number need only be specified with every request for services from the Computing Centre. The GPP is established at the time the first ID Number is issued for a department.

Statements showing current and year-to-date utilization of Computing Centre services will soon be available on a monthly basis. Each department will receive a statement showing, under every project number, the utilization by ID Number of every service supported by the Computing Centre. Each service is identified by an activity code which, in turn, is identified with and defined by an entry in a rate table printed at the bottom of each statement. The final page of every statement will show total usage to date in dollar value and projected utilization to the end of the current fiscal year.

The statement is only a summary of a department's use of Computing Centre services. Reports will be available, upon request, which will list all service transactions completed under a unique project, ID Number and activity code combination. A department may therefore request and receive a list of all the jobs submitted for /360 processing by students enrolled in a specified course (the course must be identified by a project number) or, if every student is identified by an ID Number, the number of transactions by each student may be obtained.

Further details on the accounting system will be published in future issues of the Newsletter.

ADMINISTRATIVE SYSTEMS

Approximately 40% of the Computer C.P.U. time is devoted to administrative usage. What accounts for this usage?

As with any organization involving 6500 people (faculty, students, staff) information processing becomes a vital part of the administrative function. Thus the computer is used by the Bursar's Department to facilitate the handling of payrolls, accounts receivable, accounts payable and budgets. The Registrar utilizes facilities to maintain student records, schedule courses, classes and examinations. Material is also prepared to assist in the registration process itself – course cards and student pouch material, for example. The Library is also a major user. The Acquisition of books and the control of circulation represent a typical inventory problem which is supported by the computer. Cathode ray tube terminals are now being used in the Library to allow faculty, students and staff to inquire into the status of Library material. Physical Plant and Planning maintain parts inventories on the system and the Personnel Department maintains staff records.

Present systems have been developed by Systems Analysts in the Centre and in User Departments. These groups are supported by approximately 10 programmers. Future development will be in the area of creating an information data base which will support the requirements of the total University. The information now contained in segments will be combined and form a major part of a total University Information Retreival System. Current