Proposal for a course:

COMPUTER PROGRAMMING FOR THE ARTS AND THE HUMANITIES

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CHOICE OF A COMPUTER LANGUAGE

While it is no doubt preferable that a more humanities-oriented language such as SNOBOL or SLIP form the basis of this course, the relative unavailability of any language but FORTRAN on most computers singles it out as a best "first language". For reference, the FORTRAN manual supplied by the manufacturer and as amended by the computer center at which the students will practice, will be used.

TOPICS TO BE COVERED

1. Tab equipment

The course will be punched-card oriented. The mechanics and practice of key punches, listers, sorters and the like must be known. Tab equipment also has an independent stature too often neglected in computer courses. The proper use of this equipment can facilitate many jobs that might be more tedious if a computer were used. Other computer readable media will be discussed.

2. FORTRAN

A central portion of the language will be taught. Input and output of data, especially non-numeric data, will be emphasized. The approximate sequence of instruction will be: variables; input and output (I/O) of simple variables; arrays; I/O of arrays; replacement statements; control statements; conditional control statements; subprograms.

The FORTRAN taught will form an almost universal subset of the many FORTRANS in use. The student who knows this subset will have no difficulty in programming for almost any current computer installation.

3. Review of Publications

A literature is quickly accumulating, and many scholars are active. One aim of the course will be to introduce the students to the literature pertinent to their specific interests. In some cases, source materials will be obtained through correspondence with active researchers.

4. Graphics

Not covered in the usual first programming course, but essential, is an introduction to computer graphics. There is no standard language for computer graphics; however, there are a few elements that all graphics share. The outline will follow the Association for Computing Machinery one-day introduction, ignoring the hardware and implementation details.

INTRODUCTION

The usefulness of the computer to the arts and humanities is established. At the 1967 Fall Joint Computer Conference of the American Federation of Information Processing Societies, one session was devoted to a survey of recent developments in Humanistic Computer Applications. The field is new; its journal, "Computers and the Humanities", is just entering its second year of publication.

This proposal is not the place to go into an exploration of just how the computer can be useful to those not in technology and science. The need for this course is demonstrated by the strong desire of students and teachers in the humanities to use the computer and by the fact that the conventional programming courses are inappropriate.

DIFFICULTIES WITH CONVENTIONAL COURSES

The usual course in programming is taught by a person whose training and aptitudes are in the sciences and technology. The books provided were written from the same point of view, and the exercises given are from topics familiar in elementary mathematics and scientific courses. Since programming, like so many other subjects, is best learned by doing, the humanities-oriented student runs into immediate difficulties.

The usual course will explain the features of the programming language, for example, FORTRAN, in terms of "familiar concepts". For example, "A FORTRAN arithmetic statement is just a linear, or string form, of the usual mathematical expression with the conventional hierarchy of operators." Familiar to whom? The examples are chosen to be trivial, so that the students can concentrate on the program. The method of solution is common knowledge. "Write a program to solve the general quadratic equation, find all roots, real and complex." Trivial, but not necessarily to a graduate in the humanities.

A new course is necessary. It must be taught in the context of the academic and artistic pursuits where its teachings will be applied. As in the course for scientists, the examples should expose techniques that are of wide application to the user. The problems must be typical of those the student will probably face in his own work. And even if many of those techniques, such as sorting or list processing are identical to those taught in the technically oriented course, they must be taught differently, with examples that will catch and fire the imaginations of the humanist users. The exercises should not tax a branch of his knowledge that he may have long since forgotten and will usually not need.

Using graphics, the student will not have to rely upon the printer as his only means of getting output, and certainly those interested in art will welcome the opportunity to explore a new medium.

5. Statistics

If there develops some interest in analysis of style and similar studies, a short introduction to the practical use of elementary statistics will be given.

SPECIAL EQUIPMENT REQUIRED

The graphics requirement demands that some sort of plotter or graphic terminal be available. With a hard copy digital incremental pen type plotter, work in graphics, color (with interchangeable pens or inks) and drawing (line with some solid fill) are practical. With microfilm and other photographic plotters, both line and halftone work is feasible but color is difficult. Given a terminal with CRT and light pen, only line drawing is usually practical; however, the possibilities of interacting on-line with the computer-controlled images and the use of motion become very exciting.

Not usually included in the peripheral units of a university computing center but especially useful here would be a digitizer or digitizer/plotter. This allows graphic information such as hand drawings and musical scores to be transformed into computer readable form with much less effort than a graphic "language" or "music input language" allows.