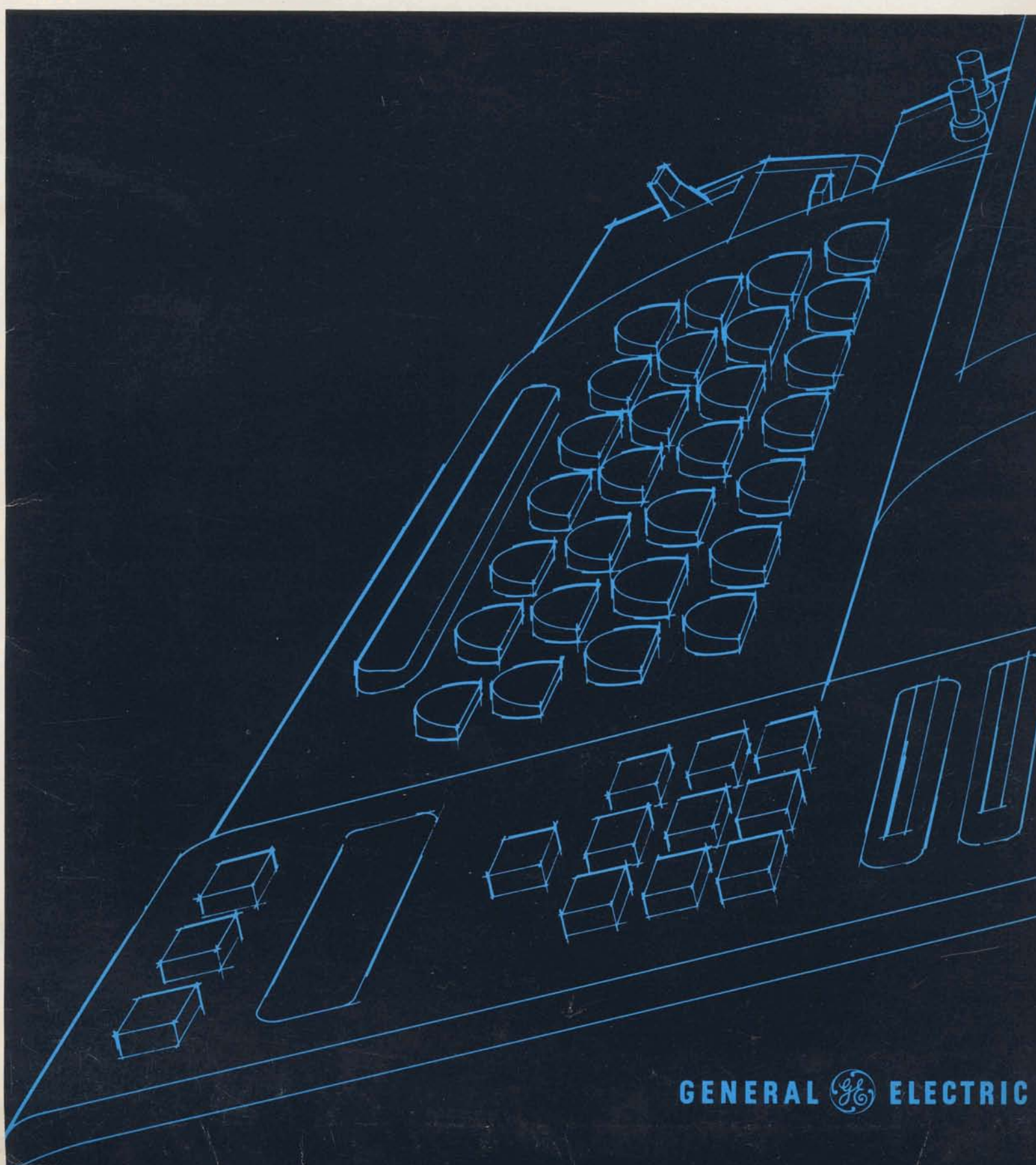


GE Time-Sharing Service



Time-Sharing
Service



GENERAL  ELECTRIC

General Electric Time-Sharing Service

On call—a million dollar system

Time-Sharing is a technique that lets many people use a computer at the same time, from many different locations.

Miles from your office sits a million dollar computer waiting to service you whenever you need it. Just dial a phone number at your office terminal, type your problem in familiar



language, and get back an answer.

At the same time, dozens of others are sharing the computer.

So the cost is shared, too.

Time-Sharing is simple. You don't have to be a computer expert to use it.

Time-Sharing is flexible. You can create, edit, test, update and store your own programs — right from your office.

Take a closer look at GE Time-Sharing Service with the information provided here.

Then give us a call.

GENERAL  ELECTRIC

NEWS BUREAU

68-210-13A

GENERAL  ELECTRIC

777 14th Street, N.W., Washington, D.C. 20005

Area Code 202—393-3600

J.P. Sweeney

(4-3-68)

BACKGROUND INFORMATION

Numerical Control Parts Programming
With GE Time-Sharing Service

COMPUTER TIME-SHARING

GE's Computer Time-Sharing Service, a product of the Information Service Department headquartered in Bethesda, Md., allows many people at scattered locations to use a remote GE computer systems at the same time from the convenience and privacy of their own office. The computer, linked by ordinary telephone lines to a teletypewriter terminal, operates so fast that it appears to be servicing all users in the same split-second.

NO MIDDLE MAN

GE time-sharing service enables people with little, if any, previous data processing experience to use modern, high-speed computer systems for immediate solutions to their problems. Until the development of this GE-pioneered technique, businessmen, engineers, and scientists were generally problem specifiers who had to work through a programmer or computer experts.

The programmer would then prepare the problem for the computer and schedule it for its turn on a batch processing system which solved one problem at a time.

Time-sharing, in effect, provides people with the use of their own "personal computer" for immediate solutions to problems.

PROGRAM LIBRARY

A major feature of GE time-sharing service is a vast library of powerful, work-saving programs stored in remote GE computer systems for use by all subscribers. Programs are retrieved by name and the user supplies his own data, variables, or information requested to solve the problem.

A user of the service can also write and store in the system programs specifically for his own applications. These programs are stored under the user's own identification number and are not available to other subscribers of the service.

NUMERICAL CONTROL PROGRAMMING

The first of a new series of library programs specifically developed for numerical control programming are now available with the service to prepare EIA coded tapes at the teletypewriter terminal. Three programs, specifically designed for the preparation of control tapes for most two- and three-axes point-to-point machine tools, have been added to the library.

NC PROGRAMS DESCRIPTION

- . NCPTS is used to describe the geometry of the piece to be machined in terms of points, lines, and circles in reference to a common coordinate system. The computer does the geometry calculations in seconds and sets up a list of X-Y coordinate pairs which is stored in the system as a Point Coordinate File.
- . NCPPP is used to prepare the actual control tape format for a specific machine tool and numerical control combination. The format is based on data stored in the Point Coordinate File, instructions which direct the tool through the machining operation, and a description of the machine tool.
- . NCEIA converts the control tape format into EIA code and directs the punching of a master control tape at the teletypewriter terminal.

CONTOURING CAPABILITY

The GE service can be used to prepare tapes for contouring operations on many two axis machines. Most firms are not taking advantage of this capability in their tools because manual programming is too complex. The service capability will be expanded with additional library programs now being developed for contouring, milling machines, and lathes.

HOURS OF OPERATION

GE time-sharing service is guaranteed available nationwide from 8 a.m. to midnight, five days a week. Moreover, in most areas the service is available around-the-clock , throughout the week.

AVAILABILITY OF SERVICE

GE time-sharing service with numerical control programming capabilities is now locally available in 61 metropolitan areas in 28 states and the District of Columbia.

In the following metropolitan telephone dialing areas, customers can dial a local telephone number and connect with a distant GE computer system without incurring long distance charges.

Akron, Ohio	Oklahoma City, Okla.
Albuquerque, N.M.	Orange County, Calif.
Atlanta, Ga.	Orlando, Fla.
Baltimore, Md.	Palo Alto, Calif.
Boston, Mass. (Metro area)	Pensacola, Fla.
Bridgeport, Conn.	Philadelphia, Pa.
Buffalo, N.Y.	Phoenix, Ariz.
Chicago, Ill. (Metro area)	Pittsburgh, Pa.
Cincinnati, Ohio	Portland, Oregon
Cleveland, Ohio	Princeton, N.J.
College Station, Pa.	Providence, R.I.
Colorado Springs, Colo.	Richmond, Va.
Columbus, Ohio	Rochester, N.Y.
Dallas, Texas	Sacramento, Calif.
Dayton, Ohio	Salt Lake City, Utah
Denver, Colo.	San Diego, Calif.
Detroit, Mich.	San Francisco, Calif.
Fort Worth, Texas	Santa Barbara, Calif.
Harrisburg, Pa.	Schenectady, N.Y.
Hartford, Conn.	Seattle, Wash.
Highland Park, N.J.	St. Louis, Mo.
Houston, Texas	Stamford, Conn.
Huntsville, Ala.	Syosset, Long Island
Indianapolis, Ind.	Syracuse, N.Y.
Los Angeles (Metro area)	Teaneck, N.J.
Milwaukee, Wis.	Toledo, Ohio
Mineola, N.Y.	Tulsa, Okla.
Nashua, N.H.	Washington, D.C. (Metro area)
New Haven, Conn.	Worcester, Mass.
New Orleans, La.	Youngstown, Ohio
New York City (Metro area)	

TYPICAL APPLICATION AREAS

- . Numerical Control Programming
- . Engineering Design and Calculations
- . Business Forecasting
- . Quality Control and Manufacturing Planning
- . Education -- classroom instruction and problem solving

COST OF STANDARD SERVICE

General -- Present user fees are \$10 per hour of terminal time and 4¢ per second of computer time. (Minimum monthly charge is \$100). Teletypewriter rental from the local phone company can range from \$80 to \$150 per month, depending on model and accessories, and is an additional charge which is billed by the phone company. Customers calling the local service number from an outside dialing area incur telephone line charges based on the distance from the local service area.

Example -- If a customer used 25 terminal hours in a month, he would probably experience 37.5 minutes of computer time based on an average user experience ratio of 40 to 1. Therefore, based on the above fee schedule, the cost of the 25 hours of terminal time would be \$250 (25 x \$10) and the computer time would be \$90 (37.5 min. = 2250 sec. x 4¢ per second).

Storage -- Cost for storage space is \$2.50 per program storage unit (1,536 characters) per month.

LANGUAGES AVAILABLE

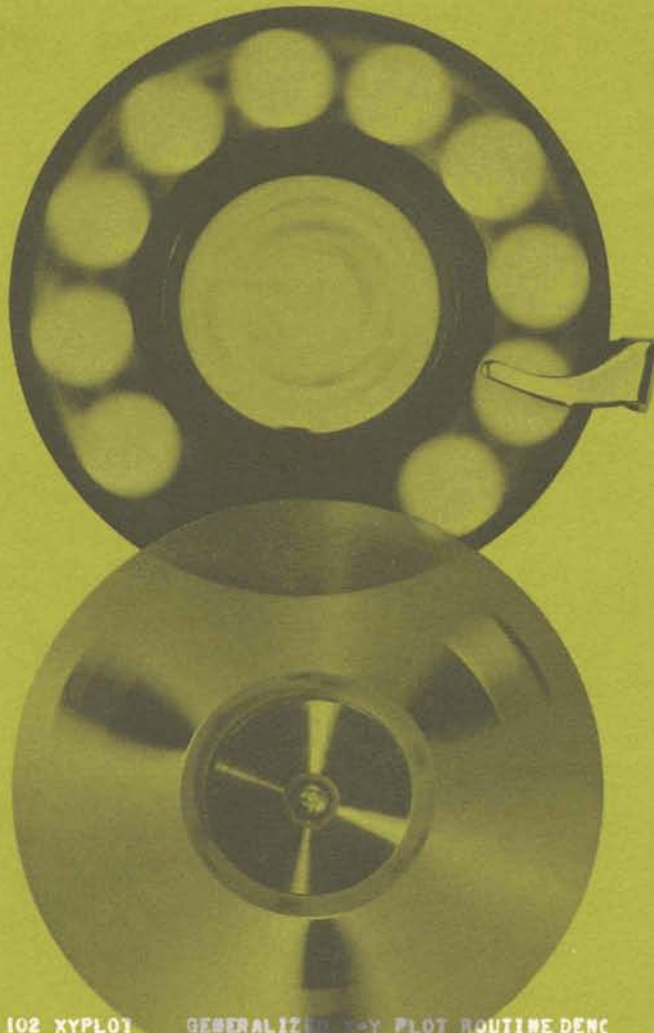
Languages used with the GE service are BASIC*, time-sharing FORTRAN, and ALGOL.

TERMINAL FACILITIES

GE's time-sharing service accommodates Model 33 and 35 teletype-writers and CalComp 500 series plotters.

* Developed by Dartmouth College

Dial GE for "Instant Computing"



102 XYPL01	GENERALIZED X-Y PLOT ROUTINE DENC
104 BENDS	STEEL BEAM SELECTION FOR VARIOUS
106 LPPILT	DESIGN OF N-DERIVED LOW-PASS FIL
108 ENGEPA	ENGR. E.P.A. PREPARATION. 'LIST'
110 LINREG	LINEAR REGRESSION CURRENT OPERATI
112 LSTGR	LEAST SQ. POLYNOMIAL CURVE FIT.
114 INTEGR	NUMERICAL INTEGRATION GENERAL USE
116 POLYMO	POLYNOMIAL EVALUATOR DESCRIPTION
118 ROOTXY	* FINDS ROOTS, MAX'S, AND MIN'S OF
120 COMPLX	FINDS REAL AND COMPLEX ROOTS OF
122 LINPRG	LINEAR PROGRAMMING-LIST LPRULE P
124 LPALGL	*ALGOL VERSION OF LINPRG INDEX TO
126 CPNONE	CREATES INPUT FOR "CPNTWO". LIST
128 CPNTWO	* CPM PROGRAM. LI
130 CALPLO	CALCULATES AND
132 DESTAT	DESCRIPTIVE STA
134 SIXCUR	LINEAR REGRESS
136 MULREG	MULTIPLE RE
138 MULTRY	MULT. P
140 TWOWAY	



Information Systems

Time-Sharing Service

Instant Computing—Economical, Simple, Flexible

Instant computing is a new way of using a computer. You simply dial G.E. right from your own desk and you immediately have a full-sized, modern General Electric computer at your disposal.

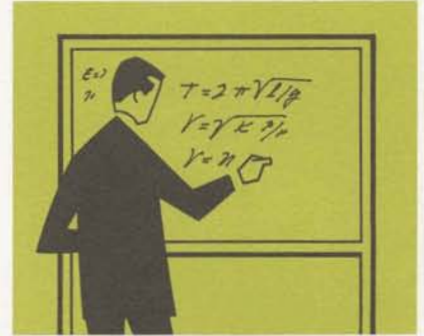
This means that you have a computer available when you really need it. You pay only a fraction of its total cost for its use.

The result is that a large, modern computer now can be economically practical regardless of the size of your organization. Yet it can be available instantly, just as though you were the sole owner and operator.

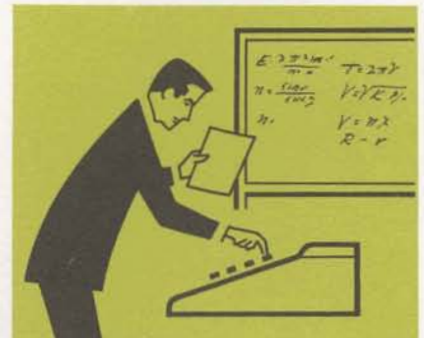
Why Use Instant Computing?

In today's business environment, your time is of utmost value. Instant Computing permits you to conserve time and use it more efficiently. If you have not used computers in the past, you know how many hours you have spent on manual calculations. And even if you have used a computer, you probably had to wait a day or more for answers to your problem. You programmed your problem (usually needing help from a trained programmer) and had it key-punched. Then you took the deck of punched cards to the computer room where your program was scheduled to run along with others. Finally, the program was processed through the computer and returned to you with the finished computations. Your program may have been correct the first time. More often than not, changes had to be made, and the deck had to be taken back to the computer and run again. This entire process probably took at least 24 hours. Instant computing, or "time sharing" as it is often called, has eliminated these delays. Now you can check out your program and put it to work for you within seconds.

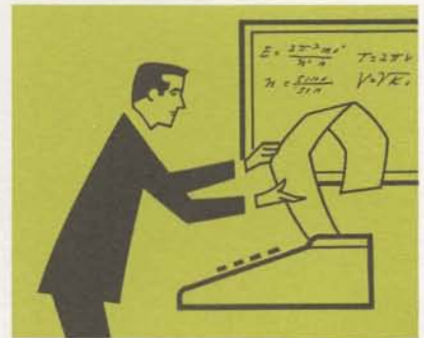
Problem definition



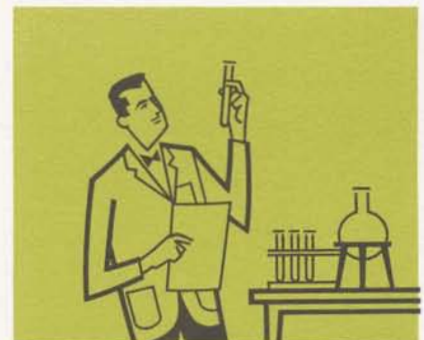
Computer calculation



Immediate solutions



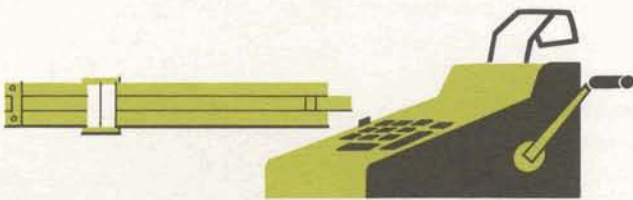
Data utilization



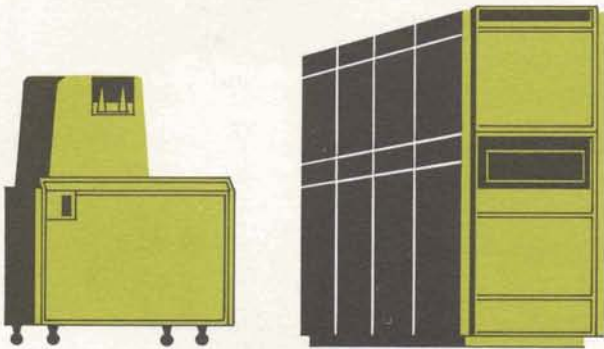
How Can Time-Sharing Service Be Used?



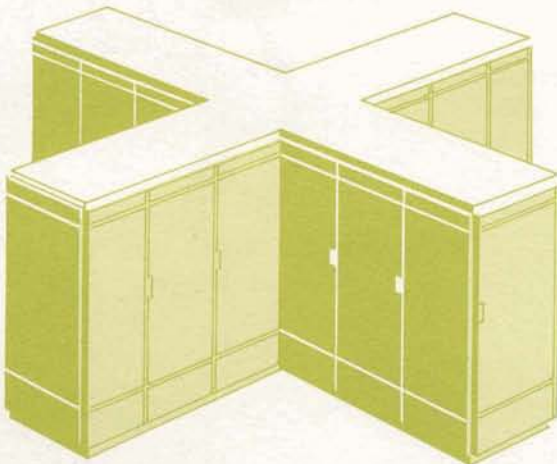
Pencil and paper



Slide rule, calculator



Small computer



Large computer

You can handle many types of applications with Time-Sharing Service—mathematical calculations and computations, statistical analysis, central file interrogation, educational techniques, business modeling—to name but a few. The most suitable jobs are those too large and time-consuming to be done manually and too small to justify the exclusive application of a large computer system.

Time sharing most efficiently solves problems now done with these computational tools.

