

JAMES A. GRAASKAMP COLLECTION OF TEACHING MATERIALS

VII. INDUSTRY EDUCATIONAL COURSES - LONG TERM

A. EDUCARE

3. EDUCARE Pilot Programs: November 30 to  
December 4, 1970 and February 21-26, 1971

COMPUTER APPLICATIONS IN REAL ESTATE ANALYSIS  
(Pilot Presentation)

November 30 to December 4, 1970

Lowell Hall  
Madison, Wisconsin

EDUCARE

educational foundation for computer applications in the real estate industry, inc.

The enclosed material has been  
assembled for the EDUCARE FOUNDATION by

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This is a working document to be distributed  
only to the participants of the pilot presentation  
in order to gain feedback and critique to guide further  
developments.

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30 November 1970

## OUTLINE

- MOD 0: Introduction of personnel and handling of registration
- MOD I: Introduction to investment analysis
  - IA. Fundamentals: illustrative investment decision - crude evaluation - time v. flow of funds
  - IB. Teletype: procedure and demonstration
  - IC. Problem solving
- MOD II. Functional fundamentals of hardware and software - algorithm, flow chart, manual calculation, etc.
- MOD III. "Basic" Basic using PAYBACK1, editing, debugging sequence, exercise
- MOD IV. Second round of basic - loops for next statements, I/O verbs, exercise
- MOD V. Staged Investments - scenario for Snoopy's staged investment - introduction of Basic III: table handling and character handling
- MOD VI. ELLWOOD analysis
- MOD VII. Modelling - examine extensively a limited real estate model, Mini Model
- MOD VIII. Computer Milieu - hardware, software, remote devices
- MOD IX. Miscellaneous applications - accounting, office services, etc.
- MOD X. Computational techniques - sorting, etc.
- MOD XI. Technological evaluation - observation, etc.
- MOD XII. Other appraisal Approaches - cost of building, market comparison
- MOD XIII. Evaluation checklist. Application program - life history of a routine, documentation; Vendor - equipment, etc.
- MOD XIV. Introduction to commercial model 1
- MOD XV. Introduction to commercial model 2
- MOD XVI. Student use of terminals with representative problem data - 4 vendors represented

MOD XVII. Debriefing of vendor contacts

MOD XVIII. Economics of timesharing in real estate

MOD XIX. The computer and decision making - social values, etc.

MOD XX. Exam and course critique

## MOD 0 INTRODUCTION

Purpose: To set the scene

Introduce personnel and participants; purpose;  
scope; approach

Handle mechanics of registration and facilities

## MOD I INTRODUCTION TO INVESTMENT ANALYSIS VIA TELETYPE

PURPOSE: This module is divided into 3 submodules. The purpose of each is given below. The contents are described on separate sheets.

- IA. Review fundamental investment analysis, procedures and principals, and introduce scenario.
- IB. Develop skills in TTY (Teletype) access using existing routine
- IC. Develop skills in critique and evaluation of a routine

## MOD IA FUNDAMENTALS OF INVESTMENT ANALYSIS

1. Illustrative investment decision. A simple build and lease offer. A second offer to utilize the same resources. Decision-making requirements and the investor's goals.
2. Crude evaluation/payback analysis/average rate of return
3. Time vs. flow of funds/discount factors/present value



## MOD IB TELETYPE ACCESS TO COMPUTER SYSTEM

1. Sign-on procedure
2. Commands to load and run programs
3. Entry of data to programs
4. Demonstration: (Using File 3 sample data), demonstrate and plot relation between present value and interest rate.

PAYBACKN - Payback analysis

PRTFILEN - to print data used

AVERATEN - Average rate return analysis

PRESVALN - Present Value Analysis

MOD IC WORK SESSION: USE OF TTY AND TS SYSTEM TO SOLVE PREVIOUS PROBLEMS

1. On TTY: Retrieve and print both offers/evaluate offers with PAYBACKN/evaluate offers with AVERATEN/load and run PRESVALN/use PRESVALN to find rate which equates present value to initial investment for both offers
2. Discussion Session
  - a. Plot your successive guesses on PRESVALN and summarize the results by all methods for both offers
  - b. Make an investment decision based upon your results
  - c. Discuss which results you weighed heavily in your discussion and why
  - d. Criticize and evaluate the tools you were given from the viewpoint of the investment principles
  - e. Criticize and evaluate the tools you were given from the viewpoint of convenience and utility of the mechanization

## MOD II FUNCTIONAL FUNDAMENTALS OF HARDWARE AND SOFTWARE

Purpose: To treat the fundamentals of Hardware and Software to the extent necessary to support discussions of computer application programming

### A. Algorithm

- 1) Definition: Specific well-defined procedures
- 2) Example of an external algorithm: "Black Box" use of PAYBACKN
- 3) Example of an internal algorithm: PAYBACK1

### B. Flow chart (PAYBACK1)

### C. Manual Calculation:

- Input sheet
- Work sheet
- Calculator
- Controller
- Output

### D. Shorthand Notation and Trace

### E. Exercise: Flow chart and trace average rate of return

### F. Computer Organization:

- I/O
- Storage
- Arithmetic
- Control

### G. Hierarchy of languages:

- Machine Language
- Compilers(Fortran, Cobol, Basic)

## MOD III "BASIC" BASIC

Purpose: To develop a minimal level of BASIC necessary to "OPEN" (to the participants) a simple program. Also to illustrate debugging problems and methodology

A. Example PAYBACK1

B. "BASIC" BASIC

1. General

- a. Statements: line number; verb; specifics
- b. Numeric Data: Variables, Constants
- c. Arithmetic Operations
- d. Logical Operations

2. Statement verbs (A minimal subset)

FILES (OPEN)  
READ #1  
LET  
IF  
PRINT  
END

C. Composing and editing

D. Debugging sequence: Syntax errors  
Logical errors  
Intermediate Print out  
Trace Procedures

E. Exercise: Debug a program for average rate of return

## MOD IV A SECOND ROUND OF BASIC

Purpose: Introduce dynamic nature of investment return problem. Present second round of BASIC

- A. Change in tax laws (or other device to require greater flexibility)
- B. Basic II
  - 1. Loops for next statements
  - 2. I/O verbs

GE  
INPUT  
READ #N  
WRITE #N  
FILES  
SCRATCH  
RESTORE

SBC  
INPUT  
GET  
PUT  
OPEN  
CLOSE

- C. Exercise: Modify average rate of return

## MOD V STAGED INVESTMENTS

Purpose: Establish forerunner for concepts of a model

Set basis for financial implications of flows  
as alternate opportunity streams

Extend participant contact with a realistic  
problem.

Introduce final round of BASIC

A. Scenario for Snoopy's Staged Investment

B. BASIC III

### 1. TABLE HANDLING

Dimensions  
Arrays  
Indices

### 2. CHARACTER HANDLING

Variables A\$  
Constants A\$  
Formatted Output

## MOD VI ELLWOOD ANALYSIS

- A. Review of Ellwood
- B. Advantages
- C. Underlying Assumptions
- D. Limitations (demonstration)

## MOD VII MODELING

Purpose: A. Introduce concept of a Module

B. Examine extensively a limited real estate model, Mini Model

Basic Assumption

How to Use

Demonstration

Problems

Critique Discussion

Financial Strength and Shortcoming

Mechanical Advantages and Disadvantages

C. Develop skills in criticizing a routine



## MOD VIII COMPUTER MILIEU

Purpose: To set basis for later discussion on economics

- A. General Hardware Survey
  - Changes in technology
  - Changes in scope of application
  - Changes in cost
- B. Software
  - Changes in technology
  - Changes in scope of application
  - Changes in cost
- C. Remote devices
  - Changes in technology
  - Changes in scope of application
  - Changes in cost
- D. Present and probable future impact of above

## MOD XIX THE COMPUTER AND DECISION MAKING

Purpose: To set perspective for the role of the machine  
and the role of man

- A. Social values
- B. What is delegated to computer
- C. What is reserved for man
- D. What is man-machine interface

## MOD XX EXAM AND COURSE CRITIQUE

Purpose: The primary purpose of this presentation is to serve as a pilot to gather feedback which will serve to direct the development effort. In keeping with this goal there will be an extensive critique and no exam. In the future there will be an exam and a feedback critique questionnaire.

MOD XVIII ECONOMICS OF TIMESHARING IN REAL ESTATE

Purpose: To provide the quantitative knowledge required  
to evaluate vendor contracts

A. Hardware

B. Software

C. Communication in the real estate environment

## MOD XVII DEBRIEFING OF VENDOR CONTACTS

Purpose: A major purpose of the entire course is to place participants in a position to negotiate intelligently with vendors. This module represents a practical field test.

A secondary purpose is to provide vendors with the courtesy of feedback on needs of a group of representative users.

MOD XVI STUDENT USE OF TERMINALS WITH REPRESENTATIVE  
PROBLEM DATA

For this presentation there will be four  
vendors represented:

1. SUNN Enterprises
2. Hodges - Prince
3. SBC
4. Realtron
5. (Realmetrics will probably participate in  
the future).

MOD XV INTRODUCTION TO COMMERCIAL MODEL 2\*

\*For this presentation the two commercially  
available models to be presented are by Sunn and Hodges.

MOD XIV INTRODUCTION TO COMMERCIAL MODEL 1\*

\*For this presentation the two commercially available models to be presented are by Sunn and Hodges.



## MOD XIII EVALUATION CHECKLIST

### A. Application Program

#### 1. Life istory of a routine:

Need  
Design  
Implementation  
Field Test  
Operation  
Modification  
Retirement

#### 2. Design trade-offs

Efficiency  
Flexibility            development  
Generality            vs  
Accuracy            operating  
Convenience

#### 3. Documentation

Flow charts  
Three levels: a) Black Box user  
              b) Operating Manual  
              c) Detailed

Need for constant documentation

### B. Vendor:

Equipment  
Services  
Software

## MOD IX MISCELLANEOUS APPLICATION

Purpose: To expand perspective with survey of other  
real estate applications and to motivate  
discussion of computational techniques

- A. Accounting
- B. Office Services
- C. Scheduling
- D. Survey
- E. Information Retrieval
- F. Land Record Access
- G. Legal Services

## MOD X COMPUTATIONAL TECHNIQUES

Purpose: To lay foundation of computational techniques  
to support data gathering and handling for  
return on investment analysis

- A. Sorting
- B. Information Retrieval
- C. Statistics
- D. Iteration

## MOD XI TECHNOLOGICAL EVALUATION

Purpose: To provide perspective of long term (3-20 years)  
evaluation of sophisticated application

- A. Observation
- B. Modeling
- C. Inversion (Appraisal Model is really inverse of  
Financial Model)
- D. Optimization

## MOD XII OTHER APPRAISAL APPROACHES

Purpose: To provide comprehensive survey of appraisal  
methods vis a vis the computer

### A. Cost of Building

Obtaining data  
Managing data

### B. Market Comparison

Data gathering  
Statistical Analysis  
Decision Theory

EDUCARE Course 1 Schedule  
Pilot Course - February 21-26, 1971

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SUNDAY

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6:00 P.M. Cocktails and dinner - Top Hat Restaurant  
(piano, violin and harp by graduate real  
estate students).

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MONDAY

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8:30 A.M. Registration, introduction on personnel  
and preliminary administrative matters.

9:00 A.M. Section 1A Introduction to investment analysis fund-  
amentals. Illustrative investment decision;  
traditional approaches to income amortiza-  
tion; crude evaluations of time versus flow  
of funds.

9:45 A.M. Section 1B Introduction to the use of a teletype.

10:00 A.M. Break and student use of teletype devices.

10:30 A.M. Section 1C Use of the teletype as a computer time  
sharing terminal. Description of procedures  
and demonstration using sample problems.

11:00 A.M. Student use of teletypes for the solution of  
several investment problems.

12:00 Lunch

1:00 P.M. Section 2 Functional fundamentals of computers, computer  
hardware and software. Algorithms, procedures,  
flow charts, manual calculations, etc.

3:00 P.M. Break

3:30 P.M. Section 3 "Basic" BASIC using PAYBACK editing, debugging  
sequence and assignment of problem for evening  
session.

5:00 P.M. Dinner

7:00 P.M. Student use of teletype terminals for solutions  
of assigned problems.

10:00 P.M. Free time (don't forget to set your alarm).

9

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## TUESDAY

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8:30 A.M.	Brief quiz on previous material covered and review of previous day's assignment.
9:00 A.M. Section 4	Second round of basic - loops, for-next statements 1/0 verbs, exercises.
10:00 A.M.	Break
10:30 A.M. Section 5	Ellwood analysis; brief review and comparison with previous analysis methods.
11:00 A.M. Section 6	Staged investments and the use of the computer for managing data. A staged investment problem. Introduction of BASIC III, table handling and charter handling.
12:00	Lunch
1:00 P.M. Section 7	Modeling; examine extensively a limited real estate model.
2:30 P.M. Section 8	Check list for the evaluation of vendor equipment and programs.
3:00 P.M.	Break
3:30 P.M. Section 9	Introduction to system and programs of Service Bureau Corporation followed by demonstration and use of this system.
5:30 P.M.	Dinner
7:00 P.M. Section 10	Introduction to Sunn Real Estate Programs.
8:00 P.M.	Use of terminals by students to evaluate Sunn programs and to complete assignments for Tuesday.
10:00 P.M.	Free time (don't forget to set your alarm).

WEDNESDAY

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8:30 A.M.		Brief quiz on previous material and review of previous day's assignments.
9:00 A.M.	Section 11	Computer milieu; the current state of the art of hardware, software and remote devices as it concerns the real estate profession.
9:45 A.M.	Section 12	Miscellaneous application of a time sharing terminal in a real estate office - part 1.
10:00 A.M.		Break
10:30 A.M.		Miscellaneous applications - part 2.
11:00 A.M.	Section 13	Computational techniques and approaches to using the computer's capabilities.
12:00		Lunch
1:00 P.M.	Section 14	Technical evolution, observation, modeling, inversion and optimization.
2:00 P.M.	Section 15	Other appraisal approaches and the potential of a time sharing terminal to support them.
3:00 P.M.		Break
3:30 P.M.	Section 16	Introduction to Realmetrics Real Estate Model followed by demonstration and student use of these programs.
5:30 P.M.		Dinner
7:00 P.M.	Section 17	Introduction to Hodges Model and programs.
8:00 P.M.		Student use of Hodges programs and completion of current assignments.



2

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THURSDAY

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8:30 A.M.	Brief quiz of previous day's material and review of previous assignments.
9:00 A.M. Section 18	Criteria for evaluating application programs.
10:00 A.M.	Break
10:30 A.M. Section 19	Vendor debriefing - part 2
11:00 A.M. Section 20	Economics of time sharing systems in the real estate profession.
12:00	Lunch
1:00 P.M. Section 21	The role of electronic calculators as a tool of the Real Estate Professional. Functions; Features; Applications; Limitations; Economics
3:00 P.M.	Break
3:30 P.M. Section 22	Computer and decision making procedures; social implications of computer use.
5:00 P.M.	Dinner
7:00 P.M.	Exam

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FRIDAY

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8:30 A.M.	Critical review of contents and format of Pilot Course.
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