

RECOMP II USER'S PROGRAM NO. 1135

PROGRAM TITLE: COST REDUCTION CURVE CALCULATIONS

PROGRAM CLASSIFICATION: GENERAL

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PURPOSE: To perform cost reduction curve calculations. This program contains instructions devised for cost reduction curve calculations based on the theory that when the quantity is doubled, the average cost (or hours) decreases by the applicable "curve" percentage. The program essentially gives the operator the capability to perform three types of cost reduction (learning) curve calculations:

1. Perform 71 calculations based on 16 basic types of problems,
2. Calculate and type-out cost reduction curve tables, and
3. Determine first unit cost and the applicable curve percentage by least squares correlation.

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----- COST REDUCTION CURVE CALCULATIONS -----

METHOD: The exponential function of the form  $Y = KX^{1-B}$  is solved for differing patterns of the dependent and independent variables. Y is total cost; K is cost of unit number 1; X is the number of units produced; 1-B is a number less than one controlling the degree of reduction in cost as quantity produced increases.

OPERATING INSTRUCTIONS:

1. Set left margin at 10, tab 30.
2. All numbers are typed in and entered with the space bar. If the wrong number is typed in, but not entered, strike the X key and enter the correct number.
3. Answers are typed with significant figures adequate for normal applications. To print out 12 significant figures, turn on Switch 'C'.
4. Press the designated Start button to perform the type of calculation desired.

START 1

Provides access to calculations 1 through 71. (See list of calculations 1 through 71 following operating instructions.) The majority of the calculations are variations on 16 basic types of problems.

- a. Enter code number on typewriter.
- b. Enter variables when computer halts with ALPHA light on.
- c. When the computer returns to location 0001.0 at completion of each calculation, enter another code number, if desired.

START 2

Calculates and types out cost reduction curve tables. Output is to (6) decimal places without Switch C.

- a. Turn on Switch C before pressing Start 2 for print-out of maximum (12) significant figures.
- b. When the program halts during type-out of the heading enter: curve  
first unit cost  
initial unit  
final unit  
interval between units

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COST REDUCTION CURVE CALCULATIONS  
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START 3

Determines first unit cost and curve by least squares correlation. The same code numbers are entered as for calculations on Start 1.

a. Calculation from release units and release average unit cost.

- (1) Enter data; the first pair of numbers entered must be the number of units omitted and their average unit cost. Enter  $\emptyset \emptyset$  if no units are omitted.
- (2) Terminate the data by entering  $\emptyset$ . (Computation will begin.)

b. Calculation from release units and release cost.

- (1) Enter data; the first pair of numbers entered must be the number of units omitted and the corresponding total cost. Enter  $\emptyset \emptyset$  if no units are omitted.
- (2) Terminate data by entering  $\emptyset$ . (Computation will begin.)

c. Calculation from cumulative units and cumulative total cost.

- (1) Enter data; the first pair of numbers entered must be the number of units omitted and the corresponding total cost. Enter  $\emptyset \emptyset$  if no units are omitted.
- (2) Terminate data by entering  $\emptyset$ . (Computation will begin.)

d. Calculation of approximate curve from sets of unit cost data.

- (1) Enter data; first pair of values must be  $\emptyset \emptyset$ .
- (2) Terminate data by entering  $\emptyset$ . (Computation will begin.)
- (3) Turn Switch D on to print the value of the Y intercept. The computer will print A. This is not the first unit cost; it is the extension of the straight line fitted to the unit costs back to the first unit.

e. Calculation from sets of cumulative average cost data.

- (1) Enter data; first pair of values must be  $\emptyset \emptyset$ .
- (2) Terminate data by entering  $\emptyset$ . (Computation will begin.)

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LOCATIONS OF PROGRAM AND SUBROUTINES  
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PROGRAM	0000.0 — 2475.0
AN-037	0470.0
AN-044	0550.0
AN-015.2	0210.0
AN-007.1	0010.0

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LIST OF CALCULATIONS 1 THROUGH 71  
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31. Cost reduction curve for a block of units not beginning at 1 - requires average cost; first unit cost; first unit in block; last unit in block.
- 26 - Change first unit cost
  - 32 - Change average cost
  - 33 - Change first unit in block
  - 34 - Change last unit in block
  - 35 - Change first and last unit in block
36. First unit cost for a block of units not beginning at 1 - requires total cost; curve; first unit in block; last unit in block.
- 37 - Change total cost
  - 38 - Change curve
  - 39 - Change first unit in block
  - 40 - Change last unit in block
  - 41 - Change first and last unit in block
42. First unit cost for a block of units not beginning at 1 - requires average cost; curve; first unit in block; last unit in block.
- 43 - Change average cost
  - 38 - Change curve
  - 44 - Change first unit in block
  - 45 - Change last unit in block
  - 46 - Change first and last unit in block
47. Unit cost of a certain unit - requires curve; first unit cost; unit number.
- 48 - Change curve
  - 49 - Change first unit cost
  - 50 - Change unit number
51. The unit with the average cost on release - requires curve; first unit in block; last unit in block.
- 52 - Change first and last unit in block
53. First unit cost and curve; requires unit costs for 2 units.
54. Cost reduction curve; requires first unit, unit/unit cost.
- 55 - Change first unit
  - 56 - Change unit/unit cost
  - 57 - Change unit cost
58. First unit cost - requires cost reduction curve, unit/unit cost.
- 59 - Change cost reduction curve
  - 60 - Change unit/unit cost
  - 61 - Change unit cost

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LIST OF CALCULATIONS 1 THROUGH 71  
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1. Total/Average cost from unit 1 - requires curve; first unit cost; number of units.
  - 2 - Change first unit cost
  - 3 - Change curve
  - 4 - Change number of units
  
5. Total/Average cost of a block of units not beginning at 1 - requires curve; first unit cost; first unit in block; last unit in block.
  - 6 - Change first unit cost
  - 7 - Change curve
  - 8 - Change first unit in block
  - 9 - Change last unit in block
  - 10 - Change first and last units in block
  
11. Cost reduction curve from unit 1 - requires total cost; first unit cost; number of units.
  - 12 - Change first unit cost
  - 13 - Change number of units
  - 14 - Change total cost
  
15. Cost reduction curve from unit 1 - requires average cost; first unit cost; number of units.
  - 12 - Change first unit cost
  - 16 - Change number of units
  - 17 - Change average cost
  
18. First unit cost for a block of units beginning at 1 - requires total cost; curve; number of units.
  - 19 - Change curve
  - 20 - Change number of units
  - 21 - Change total cost
  
22. First unit cost for a block of units beginning at 1 - requires average cost; curve; number of units.
  - 19 - Change curve
  - 23 - Change number of units
  - 24 - Change average cost
  
25. Cost reduction curve for a block of units not beginning at 1 - requires total cost; first unit cost; first unit in block; last unit in block.
  - 26 - Change first unit cost
  - 27 - Change total cost
  - 28 - Change first unit in block
  - 29 - Change last unit in block
  - 30 - Change first and last unit in block

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LIST OF CALCULATIONS 1 THROUGH 71  
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62. Table of unit cost of a block of units - requires curve; first unit cost; first and last unit in block.
- 63 - Change curve
  - 64 - Change first unit cost
  - 65 - Change first unit in block
  - 66 - Change last unit in block
  - 67 - Change first and last unit in block
68. Prints value of 1-B for calculation in computer.
69. Value of 1-B ~~requires~~ curve.
70. Value of cost reduction curve - requires 1-B.
71. Logarithm Conversion:
- To obtain logarithm:
    - Switches B, C, and D should be in the OFF position (up).
    - Enter number.
    - Logarithm will be printed.
  - To obtain Anti-logarithm:
    - Turn Switch D ON (down).
    - Enter logarithm.
    - = -Anti-logarithm will be printed.
- Type  $\emptyset$  to enter another code number.