Borrow $30,000

How much interest income earned in 2003?

$30,000 \left( P/A, 6/12\%, 120 \right) = 30,000 \left( 0.011102 \right) = 333.06/\text{month}$

$30,000 = 333.06 \left( P/A, 6/12\%, 5 \times 12 \right) + F_1 \left( P/F, 6/12\%, 5 \times 12 \right)$

$F_1 = \frac{30,000 - 333.06 \left( 51.725561 \right)}{0.741372} = 17,227.90$

still owed on house at end of 2002

$F_2 = \frac{30,000 - 333.06 \left( P/A, 6/12\%, 6 \times 12 \right)}{P/F, 6/12\%, 6 \times 12}$

$= \frac{30,000 - 333.06 \left( 60.339514 \right)}{0.698302} = 14,182.00$

still owed on house at end of 2003

$17,227.90
- 14,182.00
\frac{3045.90}{333.06 \times 12} = \text{Total paid during 2003} = 3996.72$

Thus interest paid during 2003 = $3996.72
$30,45.90
\text{tax paid} = \frac{950.82 \times 0.2}{\$190.16} = \frac{950.82}{\$950.82}$
Problem II $80,000 on a 10 year note 6% interest

$80,000 \times (0.01102) = \$888.16/\text{month}

$80,000 = 888.16 \times (\text{P/A, } (\frac{6}{12}, 5 \times 12) + \text{F}_1 \times (\text{P/F, } \frac{6}{12}, 5 \times 12))$

\[ \Rightarrow \text{F}_1 = \frac{89000 - 888.16 (51.725561)}{0.741372} \]

\[ \text{F}_1 = \$45841.7 \text{ end of 2002} \]

\[ \text{F}_2 = \frac{80,000 - 888.16 (\text{P/A, } (\frac{6}{12}, 6 \times 12))}{(\text{P/F, } \frac{6}{12}, 6 \times 12)} \]

\[ = \frac{80,000 - 888.16 (60.333514)}{0.688302} = \$37,818.7 \text{ end of 2003} \]

\[ \text{At the end of 2003} \]

\[ \text{Principal paid off} \]

\[ \text{Interest paid during 2003} \]

\[ 888.16 \times 12 = 10,657.92 \]

\[ \text{Interest paid during 2003} \]

\[ 10,657.92 - 8,123 = 2,534.92 \]

\[ \text{Tax paid} = 2,534.92 \times 0.2 = \$507.\]

If you did not do what has been paid at the end of year 5 and year 6
b) $180,000 12% interest

\[
5 \times 180,000 \times \left( \frac{P/A}{0.12} \times 120 \right) = $2574/month
\]

\[
F_1 = 180,000 - 2574 \left( \frac{P/A}{0.01} \times 60 \right) = 180,000 - 2574 \times 44.855
\]

\[
F_1 = \frac{1}{0.05045} 
\]

\[
F_1 = $116,787.8 \text{ end of 2002}
\]

\[
F_2 = 180,000 - 2574 \left( \frac{51.15038}{0.0048486} \right) = 88,854.5 \text{ end of 2003}
\]

\[
\frac{116,787.8 - 88,854.5}{17,833.3} \text{ paid off principal}
\]

\[
\text{During 2003} = 2574 \times 12 = 30,888
\]

\[
\text{Interest 2003} = 30,888 - 17,833.3 = $13,054.7
\]

\[
\text{Tax paid} = 13,054.7 \times 0.2 = $2,610.9 \Rightarrow $2,611
\]
ARRIVE TIME = EXPD(20) 3°

IF RAND < 0.8 THEN GO TO DEPART 3°

ARRIVE TIME = 0, LIMIT = 1 3°

dog: WAIT TIME = 1 3°

IF (kids >= 6) THEN GO TO moveout 3°

GOTO dog 3°

moveout: WAIT TIME = 0, MAX NORMAL (10, 2) 3°

kidswaiting = 0 3°

WAIT TIME = 0, MAX NORMAL (12, 6) 3°

WAIT TIME = EXPD (6) 3°

WAIT TIME = 2 * 60 - 1 3°

GOTO dog 3°

END.
**MODEL DESCRIPTION**

**PROGRAM**

"Final Exam 8-13-03"

**DEFINITION**

- cows = 0; pigs = 0; animals = 0; "It is legal to write these on one line"
- LABELS = {dog};

**CONTROL**

- STOPTIME=4*60*60;

**LOGIC**

[1]  ARRIVE {TIME=0 MAX NORMAL(30,5)};  \textbf{480 arrive}  \textbf{360 depart}\textbf{ cows = 120} \\
[2]  IF CLOCKTIME <= 3*60*60 THEN DEPART{}; \textbf{cows = 120} \\
[3]  cows = cows+1; \\
[4]  DEPART{}; \\
[5]  ARRIVE {TIME=EXPD(10)}; \textbf{1440 arrive} \textbf{ 1152 go to dog} \textbf{ pigs = 288} \\
[6]  IF RANDOM>= 0.2 THEN GOTO dog; \textbf{1152 go to dog} \\
[7]  pigs = pigs+1; \\
[8]  dog: IF CLOCKTIME >= 3*60*60 THEN DEPART{}; \textbf{1440 arrive - #4 stay} \textbf{ animals = 1080} \\
[9]  animals = animals + 1; \\
[10]  DEPART{}; \\

[12]
Simulation Clock : 14400.00

Block Information

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----------------------------- Global Variables -----------------------------

COWS   =  122.00
PIGS   =  273.00
ANIMALS = 1080.00