Hammurabi: Table Of Contents

Introduction

The game Hammurabi, alternatively known as The Sumer Game, originated in 1968 as a text based computer game. Hammurabi focuses on the aspect of proper resource management, or conversely dealing with the consequences when there is a lack of management, and dealing with unexpected events provided by the game environment. The game is a single player game and requires strategy to end the game with higher standings than when the game began.

Game Rules

1.) The game lasts 10 years, with a year being one turn.
2.) Each year, enter how many bushels of grain to allocate to buying (or selling) acres of land, feeding your population, and planting crops for the next year.
3.) Each person needs 20 bushels of grain each year to live and can till at most 10 acres of land.
4.) Each acre of land requires one bushel of grain to plant seeds.
5.) The price of each acre of land fluctuates from 17 bushels per acre to 26 bushels.
6.) If the conditions in your country ever become bad enough, the people will overthrow you and you won't finish your 10-year term.
7.) If you make it to the 11th year, your rule will be evaluated and you'll be ranked against great figures in history.

Game Objectives

The objective of the game is to rule your land as the Babylonian king Hammurabi. Leave your land in a better condition than when you started at the end of the 10-year term the game lasts. Feed all of your people and attempt to purchase excess land to increase your holdings under your rule. Plant all your crops when to increase your yield to have the most favorable conditions and beware of the rats.

Pseudocode

```
Opening comments
System Libraries
User Libraries
Global constants
Function prototypes
Begin Main Function
        Set Random Seed
        Define Constants and Variables
        Do the following
                Call Display title function
                        Define variables and file objects
                        Open title file
                        Read title to file
                        Close file
                        Open input file
                        Read input file as title
                        Close title file
                        End line
```

End Display title function

Call Display Rules Function

Define Variables

Output options to see rules or not

If chose to see rules display rules and press enter to play,

End line and end see rules function

Declare and initialize all the variables

Call function to display the year's data

Output the yearly data

End display data

For all the years the game is played do the following

Output question one

Input answer

Validate answer

Update and display decision making info

Output next question

Read in answer

Validate answer

Fill array ttlFed sub year minus 2

Update and output decision making info

Call first loss function

Declare variable to hold starved people

If the food amount fed is not enough

Calculate how many people died

Else starved people equals zero

Return starved people

Fill array deadYr sub 0 sub year minus 2 with year minus 1

Fill array deadYr sub 1 sub year minus 2 starved people

Output question three

Read in and validate answer

Update variable values for the next iteration

If more than 45% died end the game and move to switch menu

Call land price function

Set random seed

Get random land price

Return land price

End land price function

Call new population function

Set random seed

Get random new population

Return population

End new population function

Call crops per acre function

Set random seed

Get random new crops

Return random crop value

End function

Call second loss function

Set random seed

Get possibility of getting rats

If possibility is two then rats take up to 50% of the food

Else no food eaten by rats

Return eaten

End rat food function

Process more data for the next round

Fill rats vector sub year minus 2 with ratFood

Declare plague

If plague equals preset value

Take plague deaths out of population

Output message about plague deaths

Call function to display the year's data

Output the yearly data

End display data

For Loop ends or reiterates

If you finish with no land you lose

Else if you finish without killing everybody then you survived and output victory message

Output final statistics

Ternary operator for deciding if stats are good enough to be compared with great leaders or not

Call stats function

Declare variables to hold totals and highest values

For loop from i=0 to i<2

For loop from j=0 to j<10

Output the two dimensional array for how many died each year

If I is 0 then output the literal “dead: “

Define variables for sorting

Do

Set swap variable to false

For loop to sort the deadYr array to find the most killed in one year

While swap is true

For loop to calculate total of people fed

For loop to calculate the total grains grown

For loop to calculate how much was eaten by rats

Output the highest killed, total grains eaten, and total eaten by rats

End stats function

Asks user if they want to play again or quit

Input answer

If answer invalid

Say answer is invalid and prompt another input

If answer is invalid again

Specify the answer type asked for

Switch base on answer received

Case 1 display replay the game. Break away from switch

Case 2 display game ending and end line

End do. While answer for play again does not indicate quit

End main

Program

```
        /*
 * File:   main.cpp
 * Author: Sebastian Hall
 * Created on July 17, 2017, 11:37 PM
 * Purpose:  Final Project - Hammurabi Strategy Game
 */

//System Libraries
#include <iostream>  //Input - Output Library
#include <ctime>     //For Time Function
#include <cstdlib>   //For Rand and Srand
#include <fstream>   //For File Input/Output
#include <iomanip>   //Formatting
#include <cmath>     //For the math functions
#include <vector>    //For vector requirement
using namespace std; //Name-space under which system libraries exist

//User Libraries

//Global Constants
short const ENDYR=11;//The year constant for arrays

//Function Prototypes
void gtTitle();//Output title using file input/output
void seeRule();//Letting the player see the rules of the game
void dspYear(int &,float ,int ,float &,int &,int &,int ,int ,int);//Display
                                    //the status for the current year
short priceL();     //New price each year
short neoPop();     //The new population each year
short cropRnd();//Random crop growth each year
short loss(int);//Bushels lost by rats     //Functions Overloading
int loss(float ,int);//People lost by starvation
void stats(int [][ENDYR],int [],int [],vector<int>);//To output stats

//Execution begins here
int main() {
   //Setting random seed
   srand(static_cast<unsigned int>(time(0)));

   //Define menu choice variable
   short plyAgn;//Play Again?
```

```
//Do while to loop for replays
do{

//Display The Title
gtTitle();
cout<<endl;

//Optional Rules To See
seeRule();

//Declare and initialize variables
static int year=1;//The first year
float newPpl=0;//New people to be determined by random
int strvd=0;//The number of people you failed to feed and killed
float pop=100;//The city population. Starts at 100
int acres=1000;//City starts with 1000 acres
int totBush=2800;//Total bushels starting at 2800
int crops=0;//Amount harvested each year
int ratFood=0;//The amount the rats happened to eat that year
int lndPrc=rand()%10+17;//The current going rate for land in bushels range [17,26]
short sellBuy=0;//The number of acres one wishes to sell or buy
short acrsWrk=0;//The amount of acres you decided to work
int pplFood;//People food
int perAcre=3;//Bushels per acre
int ttlGrw[ENDYR]={0,0,0,0,0,0,0,0,0,0,0};//Array for grown each year
int ttlFed[ENDYR]={0,0,0,0,0,0,0,0,0,0,0};//The total grain for people/yr
int cnt=0;//Array increment counter
int deadYr[2][ENDYR]={0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0};//dead/yr
vector<int> rats(10);//For adding up eaten by rats


//Display the first years data
dspYear(year,newPpl,strvd,pop,acres,totBush,perAcre,ratFood,lndPrc);



//Starting Loop For Years 1-11
for(year+=1;year<ENDYR;++year){
   //Displaying the output questions
   cout<<endl<<"How Many Acres Do You Wish To Buy/Sell:   ";
   cin>>sellBuy;          //Acres for sale/purchase question


   while(sellBuy<0&&sellBuy<(acres*-1)||sellBuy>0&&sellBuy>totBush/lndPrc){
      cout<<"\nI Am Afraid That Amount Is Not Possible Hammurabi-Senpai\n"
            "Enter Again\n";
```

```
   cin>>sellBuy;
}       //Validates for both selling more land than you have and for
        //purchasing more land than you could afford



//Updating and displaying important values
acres+=sellBuy;
totBush-=sellBuy*lndPrc; //Printing new values to help make decisions
cout<<endl<<"New Acres:   "<<acres<<endl;
cout<<"Total Bushels:     "<<totBush<<endl;

//Next question
cout<<"How Many Grains Would You Like To Feed Your People:   ";
cin>>pplFood;       //Feeding people question & answer
while(pplFood<=0||pplFood>totBush){
   cout<<"\nThat Is Not A Possible Amount My King\n"
         "Enter Feeding Grains\n";
   cin>>pplFood;       //Answer validation
}
//Fill Total fed to people array
ttlFed[year-2]=pplFood;

//Decision making info output
totBush-=pplFood;
strvd=loss(pop,pplFood);
cout<<"\nTotal Acres:       "<<acres;
cout<<"\nTotal Bushels:     "<<totBush<<endl;
cout<<"Total Population:  "<<pop<<endl;

deadYr[0][year-2]=year-1;//Setting years of array inside main for loop
deadYr[1][year-2]=strvd;//Setting starved of array inside main for loop

//Question 3
cout<<"How Many Acres Do You Wish To Plant With Seed:   ";
cin>>acrsWrk;       //Crop growing answer
while(acrsWrk>acres||acrsWrk<0||acrsWrk>pop*100){
   cout<<"\nThat Is Not Possible, My Lord\n"
         "Enter Again\n";
   cin>>acrsWrk;       //Answer validation
   cout<<endl;
}
//Updating total bushels for next calculations
totBush-=acrsWrk;
cout<<endl<<endl<<endl<<endl;
```

```
   //Next Year Data Processing
   pop-=strvd;//Taking away the people who died

   //Game Failure                    //If number dead exceeds 45% in 1
   if(strvd>=static_cast<float>(pop)*0.45){//year the game ends and loses
      year=12;//Ending for loop
   }
   //Continue Data Processing For Next Iteration
   lndPrc=priceL();//Random land price
   newPpl=neoPop();//Random new population
   pop+=newPpl;//Adding new population to old population
   perAcre=cropRnd();//Crops grown per acre
   crops=perAcre*acrsWrk;//Total Acres worked
   ttlGrw[year-2]=crops;
   totBush+=crops;//Total bushels after getting crops
   ratFood=loss(totBush);//Eaten by rats. takes away from totBush
   totBush-=ratFood;//Supply minus amount eaten by rats
   rats[year-2]=ratFood;//Rat total vector




   int plague=rand()%6;        //Plague randomizer
   if(plague==3){              //If plague happens
      pop=pop*(rand()%45 +51);
      pop/=100;
      cout<<"\nOh no, a violent plague occurred and killed many "
            "citizens\n";//Alerting player of tragedy
   }

     //Displaying recurring header for each year
dspYear(year,newPpl,strvd,pop,acres,totBush,perAcre,ratFood,lndPrc);

}

//Output for losing with no land
if(year==11&&acres<1){
   cout<<endl<<endl<<endl<<"You Are A King Without A Kingdom And A Failure"
         " Of A Man\nYou Finished With No Land And "<<pop<<" People\n"
         "\nYou Lose";
}         //Congratulations output
else if(year==11&&acres>0){
   cout<<"\n\n\nCongratulations, You Survived "
         "All Ten Years Without Failing\n"
```

```
            "Horribly And Causing Mass Genocides And Revolts\n";
      cout<<"You Ended With "<<pop<<" People And "<<acres<<" Acres.\n"
            "That Averages To About "<<acres/static_cast<float>(pop)
            <<" Acres Per Person\n\nYou Win";
   (acres/static_cast<float>(pop)>=12)?cout<<"\nYou Lead A Country Like Trump":
      cout<<"\nYou Have Not Yet Reached Trump Status";
   }   //Compares you with great leaders based on score like original does

   else{//Killing too many people output
      cout<<"\nYou Have Killed "<<strvd<<" people in 1 year\n"
            "You Have Been Dethroned And Executed For Incompetence\n"
            "You Lose The Game\n";
   }
   stats(deadYr,ttlFed,ttlGrw,rats);//Calling stats function after game ends

   //Asking to play again or quit
   cout<<"\n\n\n1.) Play Again\n2.) Quit\n";
   cin>>plyAgn;       //play again answers
   if(plyAgn>2||plyAgn<1){
      cout<<"\nInvalid Answer Input\nEnterAgain\n";
      cin>>plyAgn;//Answer validation
      if(plyAgn>9){//Nested loop
         cout<<"Enter A Single Digit Number From 1 To 2 To Proceed\n";
         cin>>plyAgn;
      }
   }
   switch(plyAgn){
      case 1:cout<<"\nGame Restarting\n\n\n";break;//Playing Again option
      case 2:cout<<"\nGame Ending\n\n\n";        //Ending Game option
   }

   }
   while(plyAgn!=2);//Replays game if choice does not equal two
   //A Sebastian Production
   return 0;
}


void gtTitle(){
   //Opening and writing to the Rules File
   ofstream title;     //Input file variable name
   string ttl;        //Variable used to read file info to

   title.open("title.dat");       //Opening file

   title<<"Hammurabi: A Game Of Strategy";//Reading title to file
```

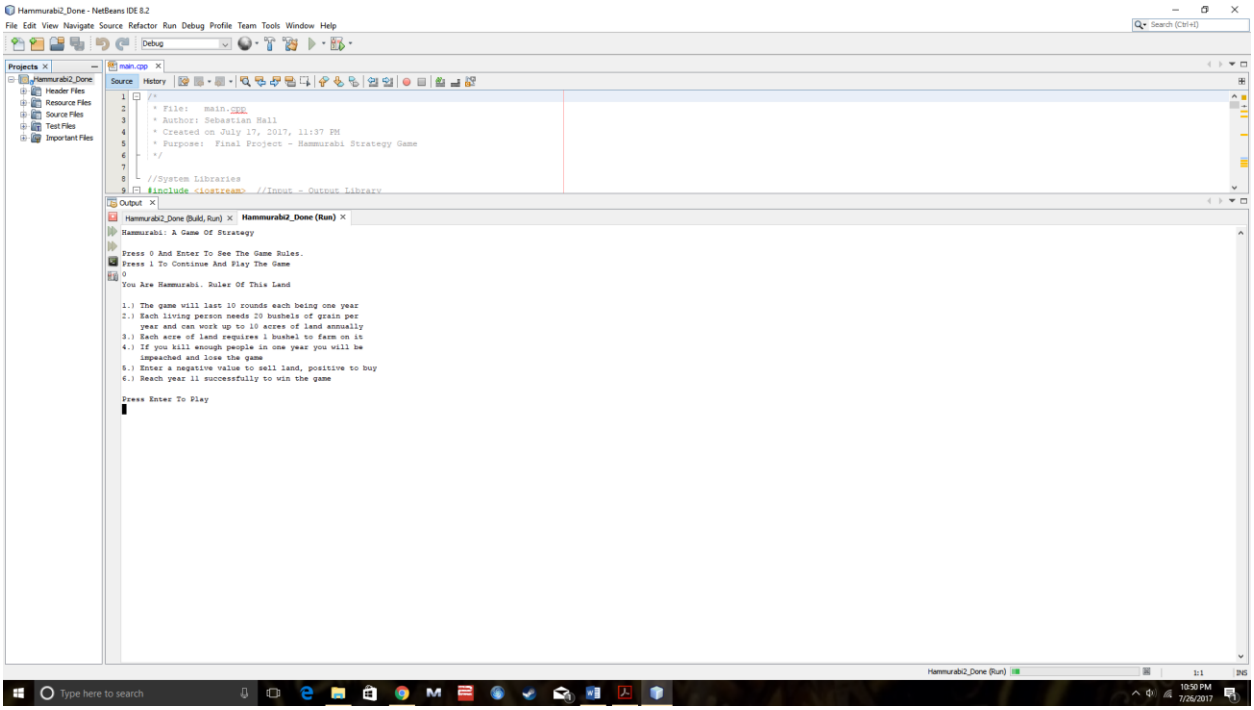
```
   title.close();          //Closing file

   ifstream titleO;        //Input file variable
   titleO.open("title.dat");       //Opening input file

   while(titleO>>ttl){         //Displaying file name one string at a time
      cout<<ttl<<" ";
   }
   titleO.close();//Closing file
   cout<<endl;
}

void seeRule(){
   char ans;               //The answer given (just to check off char)
   bool choice;            //Boolean value for the rules display choice

   cout<<"Press 0 And Enter To See The Game Rules.\nPress "//Rules input prompt
         "1 To Continue And Play The Game\n";
   cin>>ans;       //inputting choice to see rules
   choice=ans-48;   //Setting the char to the boolean

   if(choice==false){
      cout<<"You Are Hammurabi. Ruler Of This Land\n\n"
   "1.) The game will last 10 rounds each being one year\n"
   "2.) Each living person needs 20 bushels of grain per\n"//The Game Rules
   <<setw(4)<<""<<"year and can work up to 10 acres of land annually\n"
   "3.) Each acre of land requires 1 bushel to farm on it\n"
   "4.) If you kill enough people in one year you will be\n"
   <<setw(4)<<""<<"impeached and lose the game\n"
   "5.) Enter a negative value to sell land, positive to buy\n"
   "6.) Reach year 11 successfully to win the game\n\n";

      cout<<"Press Enter To Play\n";
      cin.ignore();       //Clear null terminator out of keyboard buffer
      cin.get();          //Enter to go to the next screen
   }
   cout<<endl<<endl;
}

void dspYear(int &year,float newPpl,int strvd,float &pop,int &acres
,int &totBush,int perAcre,int ratFood, int lndPrc=23){
   cout<<setprecision(0)<<fixed;           //Making all outputs wholenumbers
   cout<<"Hammurabi: I beg to report to you,\n"
         "In year "<<year<<endl;                 //Header similar to real
   cout<<strvd<<" People starved\n";               //In game header
   cout<<newPpl<<" People came to the city\n";
```

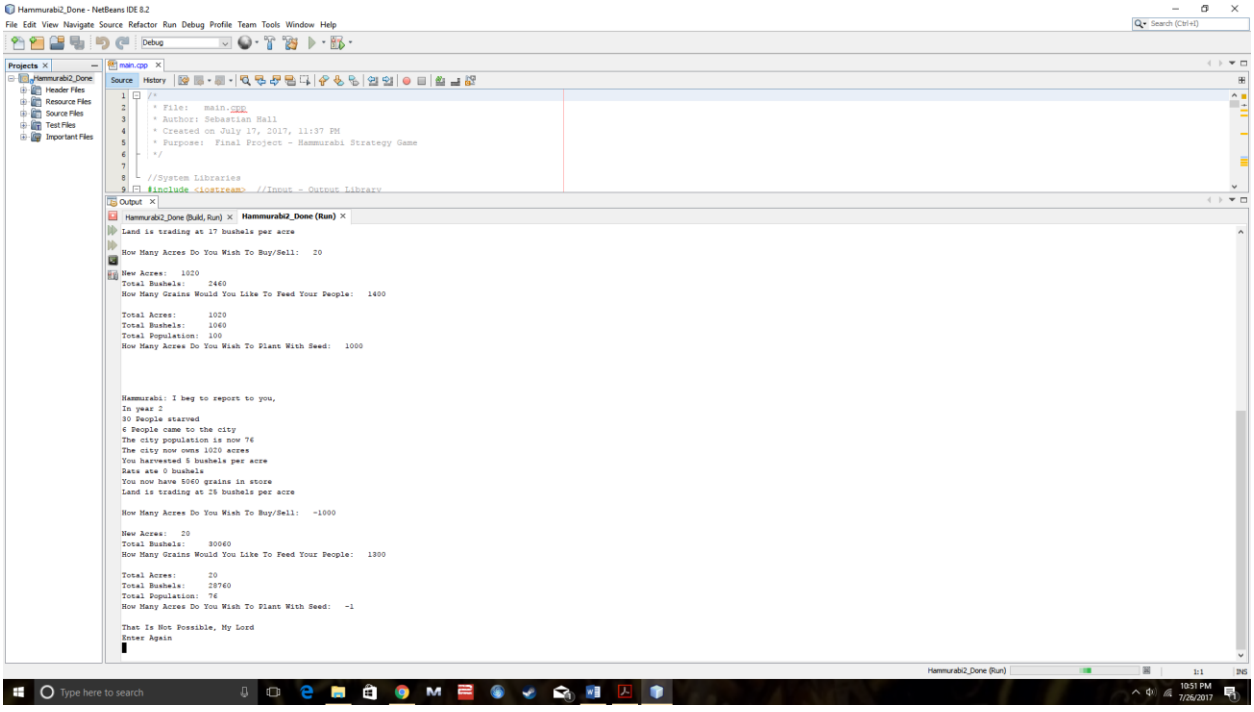
```
    cout<<"The city population is now "<<pop<<endl;
    cout<<"The city now owns "<<acres<<" acres\n";
    cout<<"You harvested "<<perAcre<<" bushels per acre\n";
    cout<<"Rats ate "<<ratFood<<" bushels\n";
    cout<<"You now have "<<totBush<<" grains in store\n";
    cout<<"Land is trading at "<<lndPrc<<" bushels per acre\n";

}

short priceL(){
    short lndPrc=rand()%10+17;//Assigning land price to random

    return pow(lndPrc,1);//Returning land price for each round
//Just to technically use cmath . No uses of it in this program
}

short neoPop(){
    //Calculating new people each year
    short newPop=rand()%10+3;//Range [3,17]
    return newPop;//returning the amount of new people
}

short cropRnd(){
    //Calculating random crop variable each year
    short perAcre=0;//Initialize to 0
    perAcre=rand()%5+1;//Range [1,5] crops per acre

    return perAcre;//Returning bushels per acre variable
}

short loss(int totBush){
    //Calculating random possibility of rats
    short poss=0;//Start at 0
    poss=rand()%3+1;//Possibility of rats eating grain is 1/3
    short eaten=0;//The numeric amount eaten

    if(poss==1){//If poss =1 then rats will come else
    float perc;//Percentage of crops ravaged by rats
    perc=rand()%50+1;//Range of [1,50] percent
    eaten=(totBush*perc/100);
    }
    else
        eaten=0;//No rats = np food eaten
    return eaten;//send back amount eaten
}
```

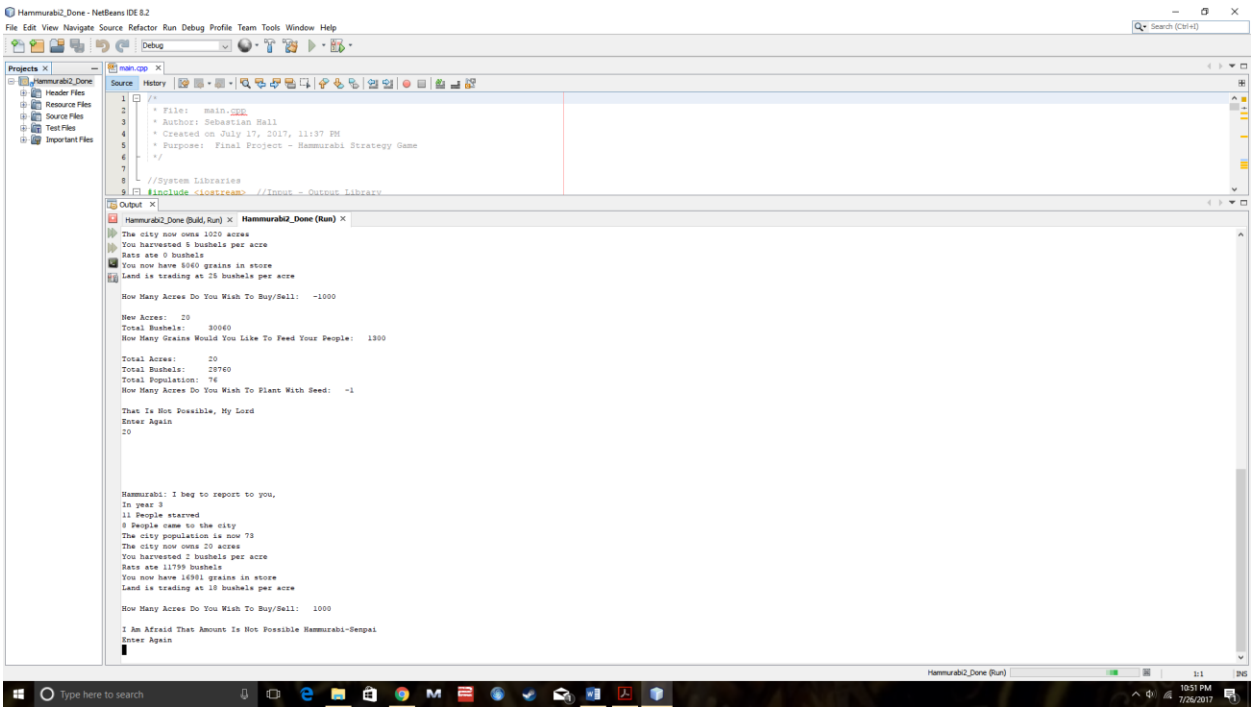
```
int loss(float pop,int pplFood){
   short strvd;
   if(pplFood/20<=pop){
      strvd=pop-pplFood/20;//Calculate how many starved if inadequate food
   }                    //Is offered
   else
      strvd=0;    //If enough food is given, strvd is default 0
   return strvd;//Return dead people
   }


void stats(int deadYr[][11],int ttlFed [],int ttlGrw[],vector<int> rats){
   cout<<"\n\nYear: ";
   int tGrw=0;//Total grown
   int tFed=0;//Total fed
   int highest=0;
   int ratTtl=0;

   for(int i=0;i<2;i++){
      for(int j=0;j<10;j++){
         cout<<setw(2)<<deadYr[i][j]<<" ";
      }
      if(i==0);
      cout<<endl<<"Dead: ";
   }
   //Sorting deadYr
   bool swap;
   int temp;
   do{
      swap=false;
      for(int i=0;i<2;i++){
         for(int j=0;j<ENDYR;j++){
            if(deadYr[i]>deadYr[i+1]){
               temp=deadYr[i][j];            //Sorting before searching
               deadYr[i][j]=deadYr[i][j+1];
               deadYr[i][j+1]=temp;
               swap=true;
            }
         }
      }
   }while(swap);

   //Calculate totals from arrays
   for(int i=0;i<ENDYR-1;i++){
      tFed+=ttlFed[i];
```

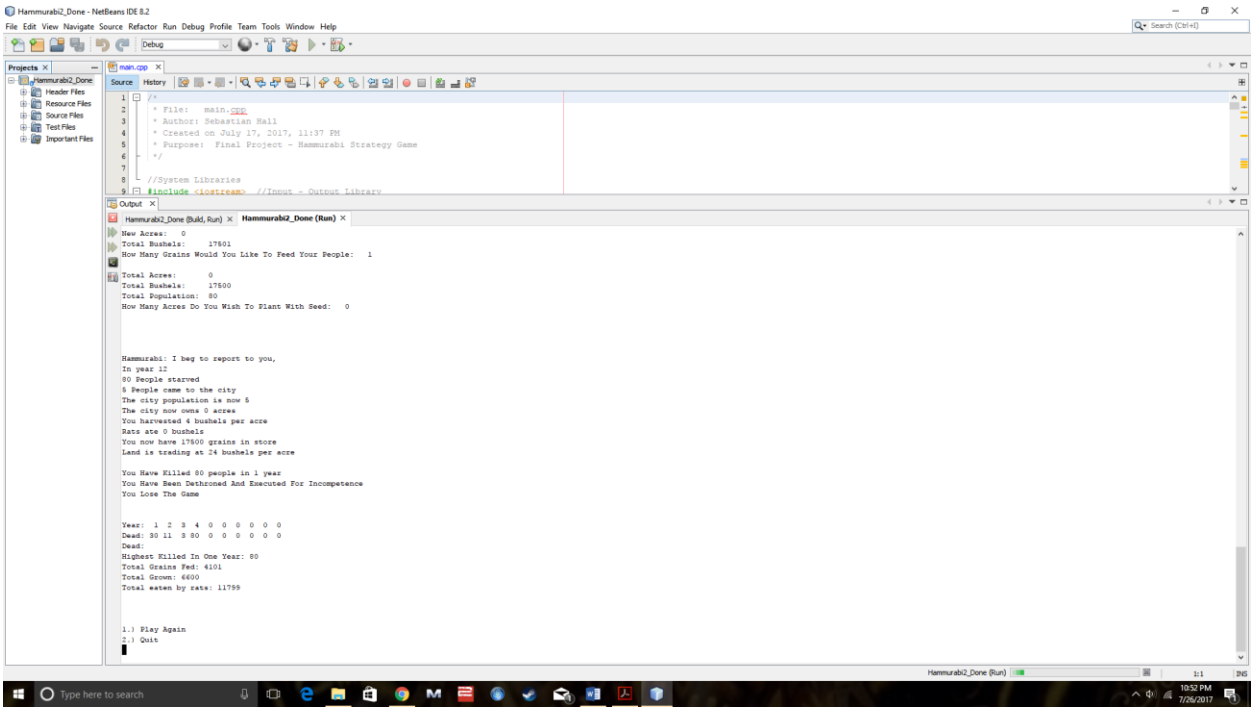
```
    }
    //Calculate totals from arrays
    for(int i=0;i<ENDYR-1;i++){
        tGrw+=ttlGrw[i];
    }
    //Calculate totals from arrays
    for(int i=0;i<ENDYR-1;i++){
        ratTtl+=rats[i];
    }
    //Getting high from linear search
    for(int i=0;i<ENDYR-1;i++){
        if(deadYr[1][i]>highest)
            highest=deadYr[1][i];
    }
    //Output remaining statistics
    cout<<endl<<"Highest Killed In One Year: "<<highest<<endl<<
            "Total Grains Fed: "<<tFed<<endl<<"Total Grown: "<<tGrw<<endl
            <<"Total eaten by rats: "<<ratTtl<<endl;


}
```

Sample I/O


Hammurabi2_Done - NetBeans IDE 8.2
Hammurabi: A Game Of Strategy
Press 0 And Enter To See The Game Rules.
Press 1 To Continue And Play The Game
0
You Are Hammurabi. Ruler Of This Land
1.) The game will last 10 rounds each being one year
2.) Each living person needs 20 bushels of grain per year and can work up to 10 acres of land annually
3.) Each acre of land requires 1 bushel to farm on it
4.) If you kill enough people in one year you will be impeached and lose the game
5.) Enter a negative value to sell land, positive to buy
6.) Reach year 11 successfully to win the game
Press Enter To Play


Hammurabi2_Done - NetBeans IDE 8.2
Land is trading at 17 bushels per acre
How Many Acres Do You Wish To Buy/Sell: 20
New Acres: 1020
Total Bushels: 2460
How Many Grains Would You Like To Feed Your People: 1400
Total Acres: 1020
Total Bushels: 1060
Total Population: 100
How Many Acres Do You Wish To Plant With Seed: 1000
Hammurabi: I beg to report to you,
In year 2
30 People starved
6 People came to the city
The city population is now 76
The city now owns 1020 acres
You harvested 5 bushels per acre
Rats ate 0 bushels
You now have 5060 grains in store
Land is trading at 25 bushels per acre
How Many Acres Do You Wish To Buy/Sell: -1000
New Acres: 20
Total Bushels: 30060
How Many Grains Would You Like To Feed Your People: 1300
Total Acres: 20
Total Bushels: 28760
Total Population: 76
How Many Acres Do You Wish To Plant With Seed: -1
That Is Not Possible, My Lord
Enter Again


Hammurabi2_Done - NetBeans IDE 8.2
File Edit View Navigate Source Refactor Run Debug Profile Team Tools Window Help
Debug
Projects
Hammurabi2_Done
Header Files
Resource Files
Source Files
Test Files
Important Files
main.cpp
Source History
/*
* File: main.cpp
* Author: Sebastian Hall
* Created on July 17, 2017, 11:37 PM
* Purpose: Final Project - Hammurabi Strategy Game
*/
//System Libraries
#include <iostream> //Input - Output Library
Output
Hammurabi2_Done (Build, Run)
Hammurabi2_Done (Run)
The city now owns 1020 acres
You harvested 5 bushels per acre
Rats ate 0 bushels
You now have 5060 grains in store
Land is trading at 25 bushels per acre
How Many Acres Do You Wish To Buy/Sell: -1000
New Acres: 20
Total Bushels: 30060
How Many Grains Would You Like To Feed Your People: 1300
Total Acres: 20
Total Bushels: 29760
Total Population: 76
How Many Acres Do You Wish To Plant With Seed: -1
That Is Not Possible, My Lord
Enter Again
20
Hammurabi: I beg to report to you,
In year 3
11 People starved
0 People came to the city
The city population is now 73
The city now owns 20 acres
You harvested 2 bushels per acre
Rats ate 11799 bushels
You now have 16901 grains in store
Land is trading at 18 bushels per acre
How Many Acres Do You Wish To Buy/Sell: 1000
I Am Afraid That Amount Is Not Possible Hammurabi-Senpai
Enter Again
Type here to search
10:51 PM
7/26/2017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//System Libraries
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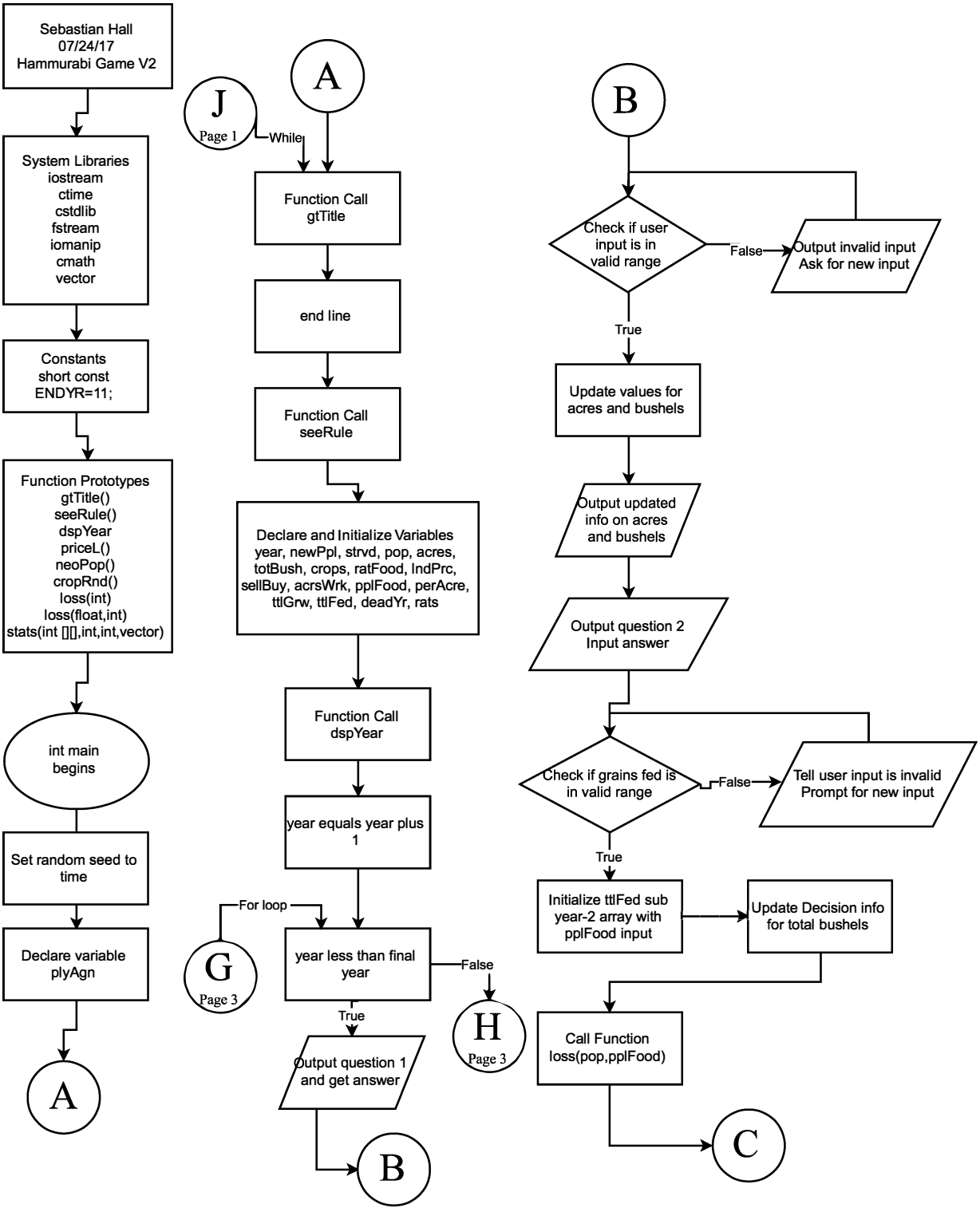
Output
Hammurabi2_Done (Build, Run)
Hammurabi2_Done (Run)
New Acres: 0
Total Bushels: 17501
How Many Grains Would You Like To Feed Your People: 1
Total Acres: 0
Total Bushels: 17500
Total Population: 80
How Many Acres Do You Wish To Plant With Seed: 0
Hammurabi: I beg to report to you,
In year 12
80 People starved
5 People came to the city
The city population is now 5
The city now owns 0 acres
You harvested 4 bushels per acre
Rats ate 0 bushels
You now have 17500 grains in store
Land is trading at 24 bushels per acre
You Have Killed 80 people in 1 year
You Have Been Dethroned And Executed For Incompetence
You Lose The Game
Year: 1 2 3 4 0 0 0 0 0 0
Dead: 80 11 3 80 0 0 0 0 0 0
Dead:
Highest Killed In One Year: 80
Total Grains Fed: 4101
Total Grown: 6600
Total eaten by rats: 11799
1.) Play Again
2.) Quit
Type here to search
10:52 PM
7/26/2017

Cross Reference for Project 2

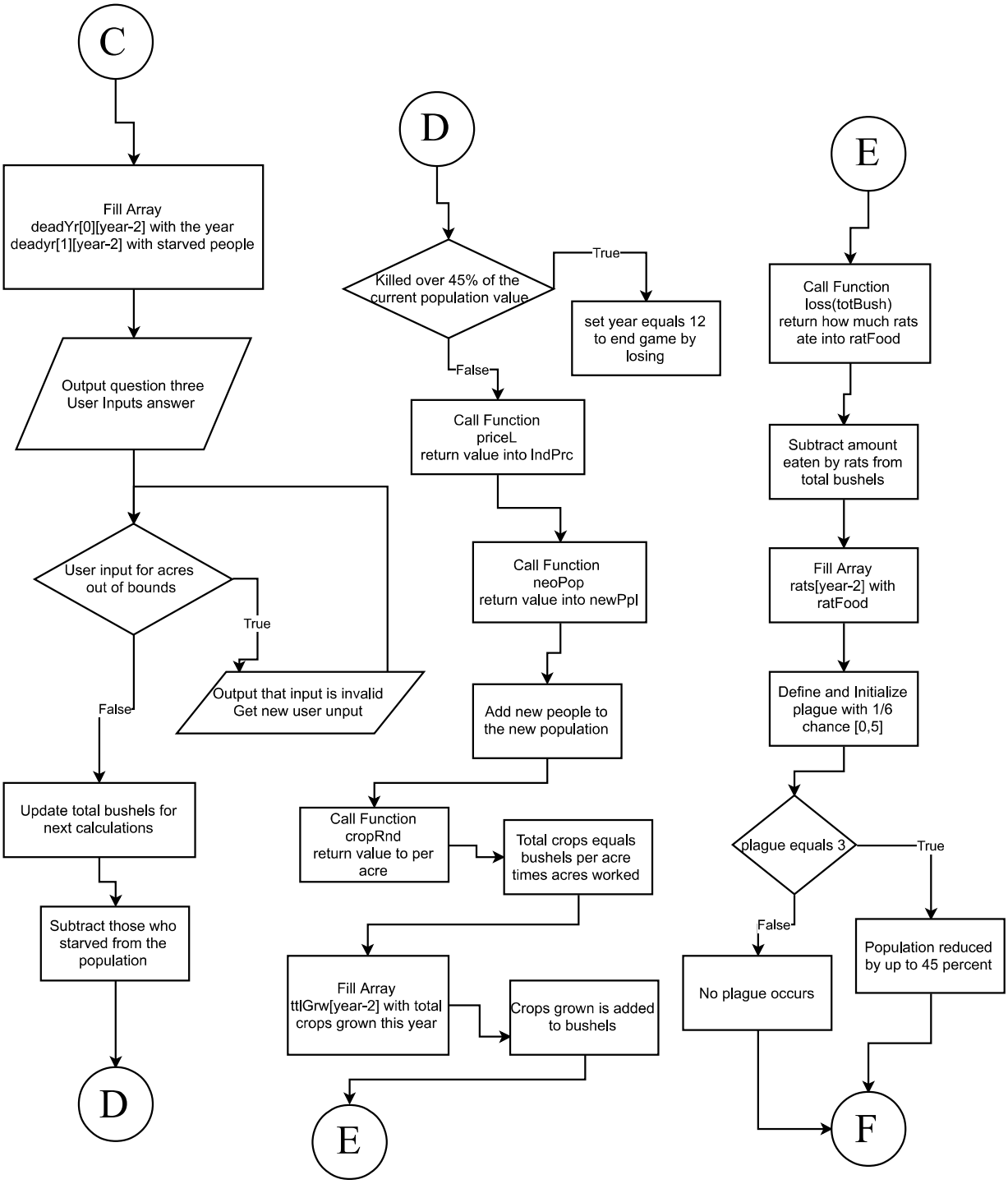
			Where in Code
Chapter	**Section**	**Topic**	**Line number**
2	2	cout	Line 82
	3	libraries	iostream, iomanip, cmath, cstdlib, fstream, string, ctime
	4	variables/literals	Line 83 & Line 59
	5	Identifiers	Line 64
	6	Integers	Line 65
	7	Characters	Line 240
	8	Strings	Line 222 & 232
	9	Floats No Doubles	Line 55
	10	Bools	Line 241
	11	Sizeof *****	N/A
	12	Variables 7 characters or less	Line 53 - 71
	13	Scope ***** No Global Variables	N/A
	14	Arithmetic operators	Line 97
	15	Comments 20%+	All Throughout
	16	Named Constants	Line 21
	17	Programming Style ***** Emulate	N/A
3	1	cin	Line 104
	2	Math Expression	Line 161
	3	Mixing data types ****	N/A
	4	Overflow/Underflow ****	N/A
	5	Type Casting	Line 141
	6	Multiple assignment *****	N/A
	7	Formatting output	Line 345
	8	Strings	Line 222 & 232
	9	Math Library	Line 287
	10	Hand tracing ******	N/A
4	1	Relational Operators	Line 86
	2	if	Line 141
	4	If-else	Line 314 & Line 319
	5	Nesting	Line 335 & Line 336
	6	If-else-if	Line 171 & Line 178
	7	Flags *****	N/A
	8	Logical operators	Line 86
	11	Validating user input	Line 105
	13	Conditional Operator	Line 185
	14	Switch	Line 207
5	1	Increment/Decrement	Line 80
	2	While	Line 126
	5	Do-while	Line 44 & Line 213
	6	For loop	Line 376
	11	Files input/output both	Line 221 - Line 235
	12	No breaks in loops ******	N/A

6	3	Function Prototypes	Line 24 - Line 33
	5	Passing by value	Line 168
	8	Returning values from functions	Line 287
	9	Returning a boolean ******	N/A
	10	No Global Variables Allowed	Line 21
		Only Global Constants	Line 168
		Meaning Conversions,Physical Con	Line 27
	11	Static Local	Line 42
	12	Default arguments	Line 267
	13	Reference Parameters	Line 266
	14	Overloading functions	Line 32 & Line 33 & Line 307 & Line 325
	15	Exit function *******	N/A
7	4	Array Initialization	Line 67
	6	Processing Arrays	Line 367 - Line 370
	7	Parallel Arrays	Line 67 & Line 87
	8	Arrays as function arguments	Line 194
	9	2-D Arrays	Line 70 & Line 343 - Line 349
	12	STL Vector	Line 71 & Line 154
8	1	Linear and Binary Search	Line 380 - Line 383
	3	Bubble and Selection Sort	Line 355 - Line 364
	5	Search/Sorting Vectors ******	N/A
****** Not required to show			

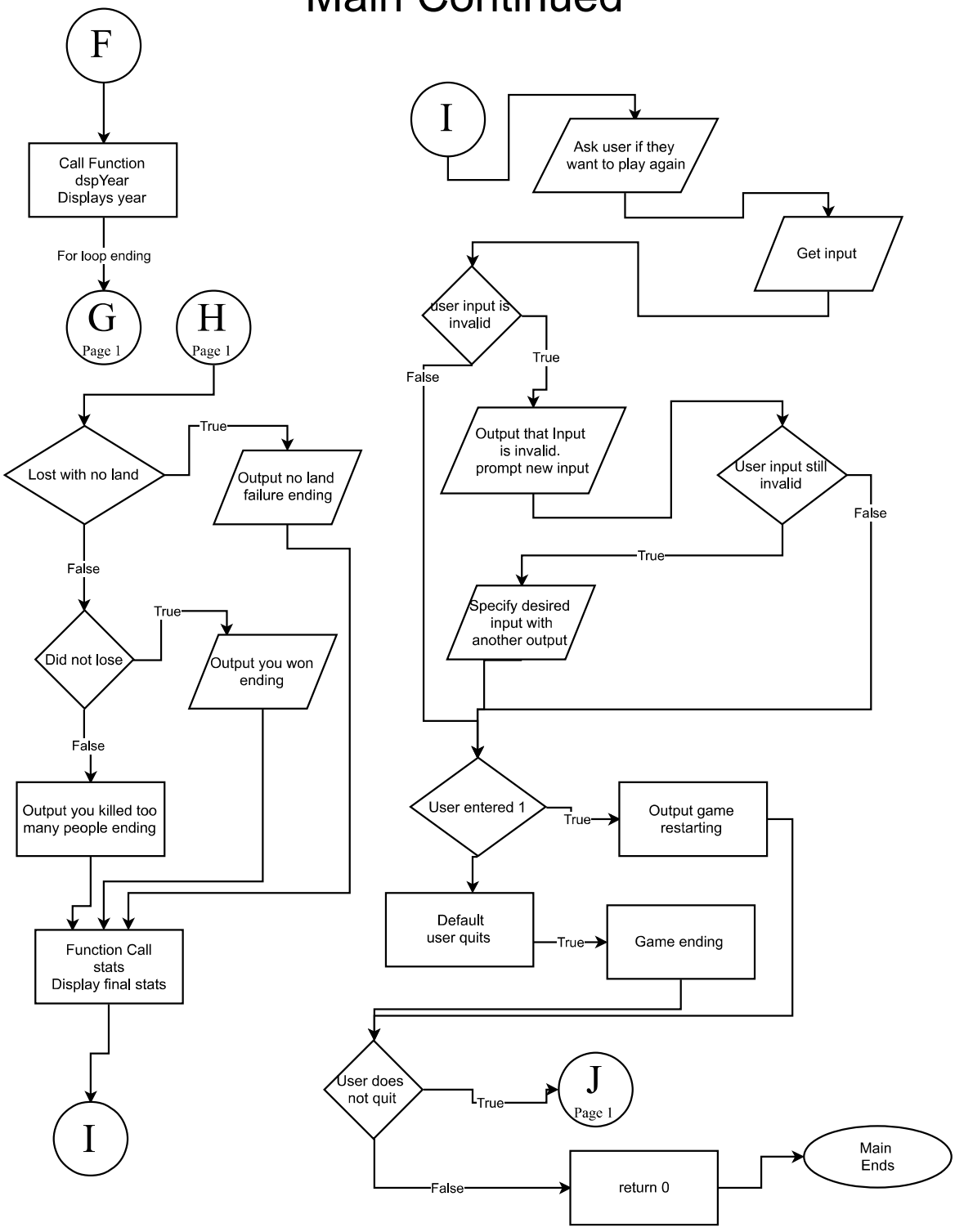
Flowchart


Sebastian Hall
07/24/17
Hammurabi Game V2
System Libraries
iostream
ctime
cstdlib
fstream
iomanip
cmath
vector
Constants
short const
ENDYR=11;
Function Prototypes
gtTitle()
seeRule()
dspYear
priceL()
neoPop()
cropRnd()
loss(int)
loss(float,int)
stats(int [][],int,int,vector)
int main
begins
Set random seed to
time
Declare variable
plyAgn
A
J
Page 1
While
A
Function Call
gtTitle
end line
Function Call
seeRule
Declare and Initialize Variables
year, newPpl, strvd, pop, acres,
totBush, crops, ratFood, IndPrc,
sellBuy, acrsWrk, pplFood, perAcre,
ttlGrw, ttlFed, deadYr, rats
Function Call
dspYear
year equals year plus
1
For loop
G
Page 3
year less than final
year
False
True
H
Page 3
Output question 1
and get answer
B
B
Check if user
input is in
valid range
False
Output invalid input
Ask for new input
True
Update values for
acres and bushels
Output updated
info on acres
and bushels
Output question 2
Input answer
Check if grains fed is
in valid range
False
Tell user input is invalid
Prompt for new input
True
Initialize ttlFed sub
year-2 array with
pplFood input
Update Decision info
for total bushels
Call Function
loss(pop,pplFood)
C

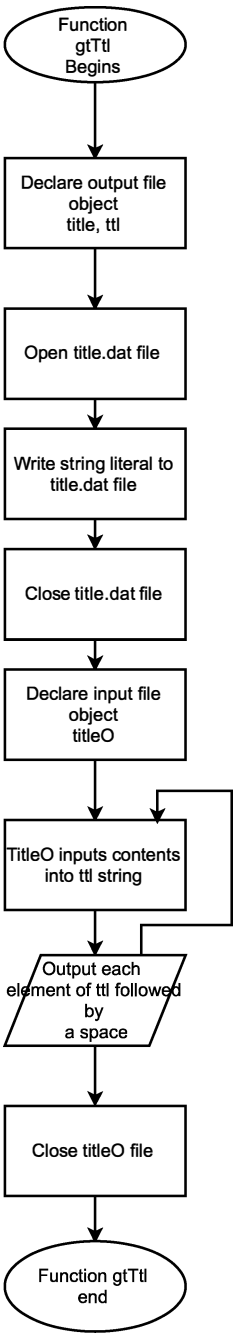
Main Continued



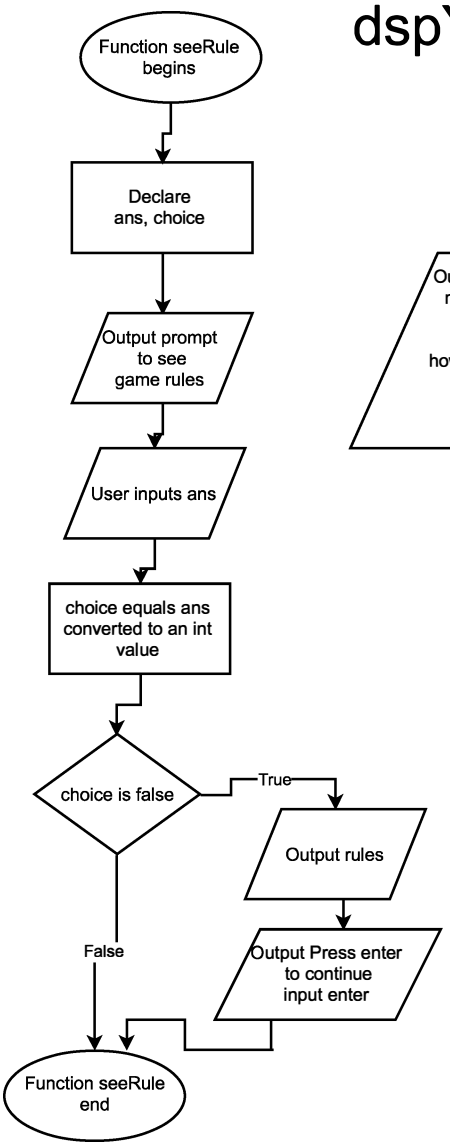
Main Continued



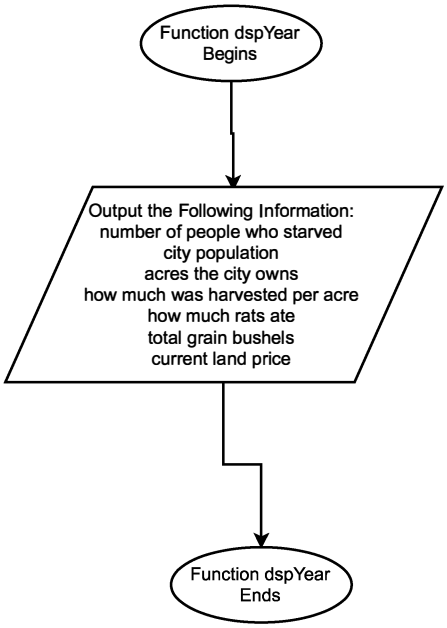
GtTtl Function



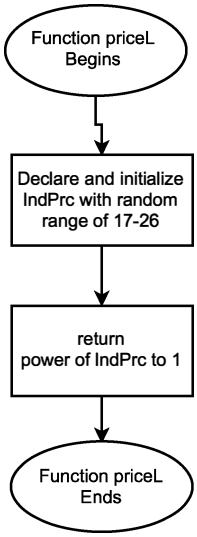
seeRuleFunction



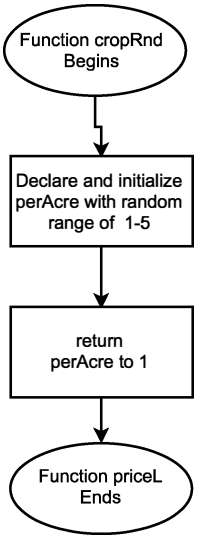
dspYear Function



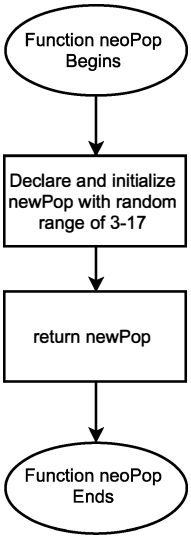
priceL Function



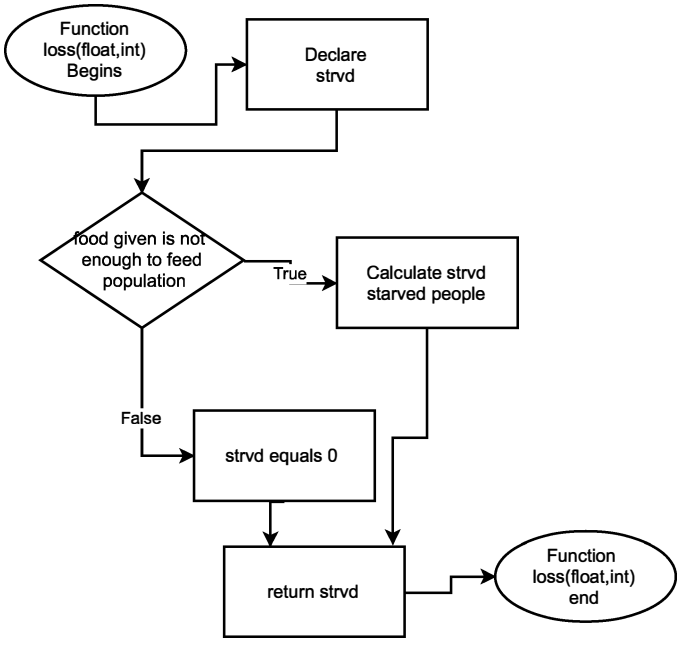
priceL Function



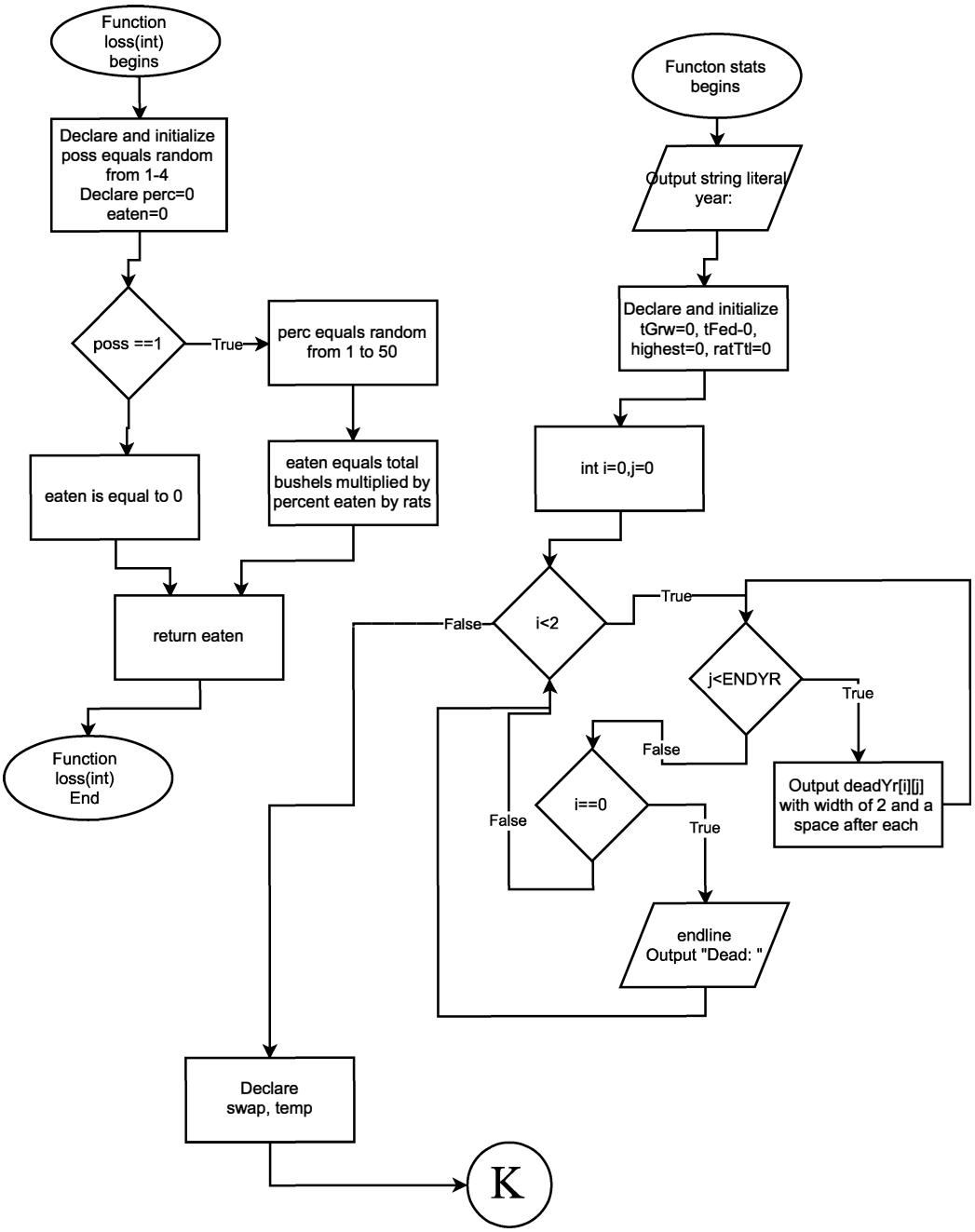
neoPop Function



loss(float,int) Function

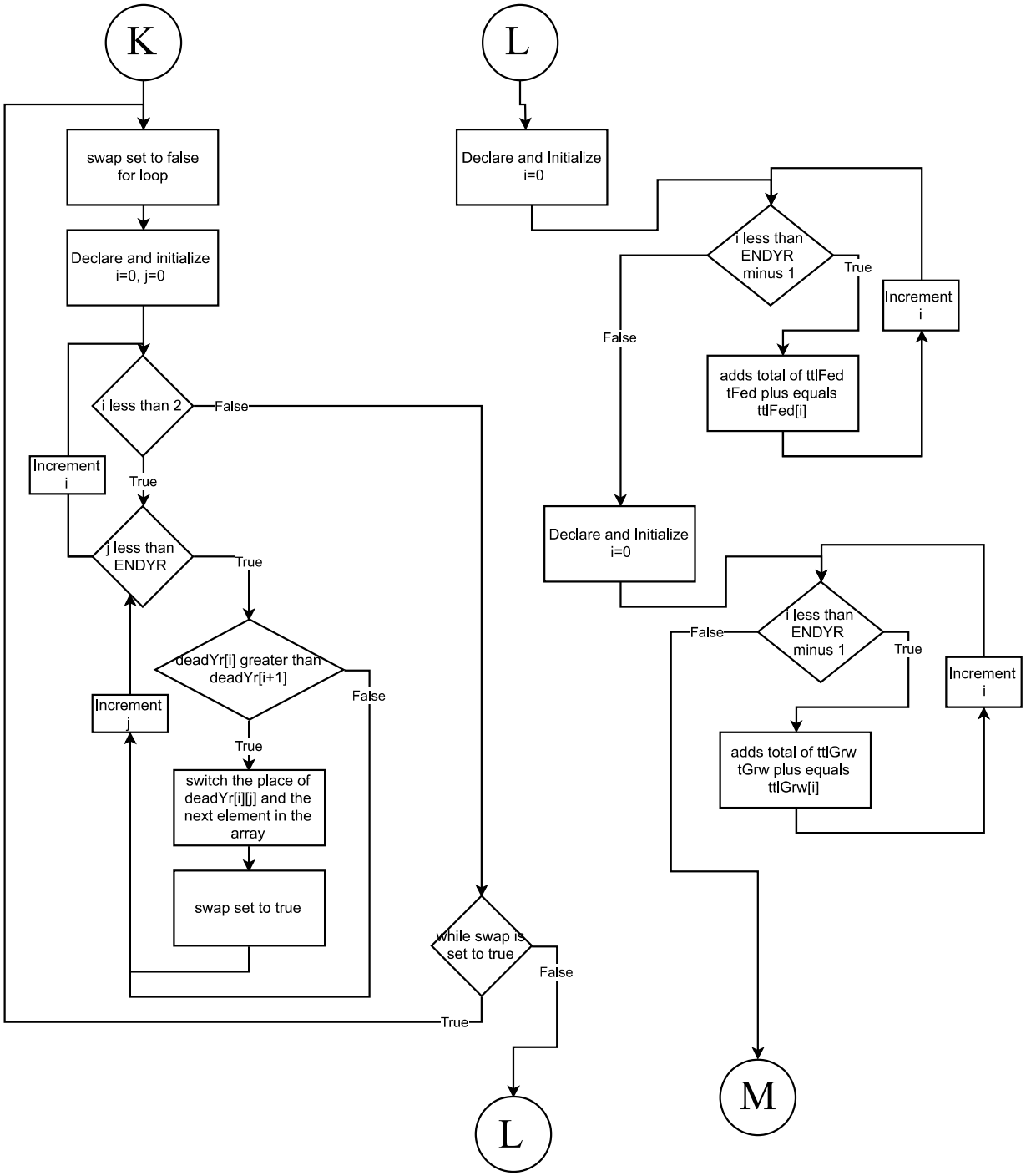


priceL Function



stats Function

stats Function Continued



stats Function Continued