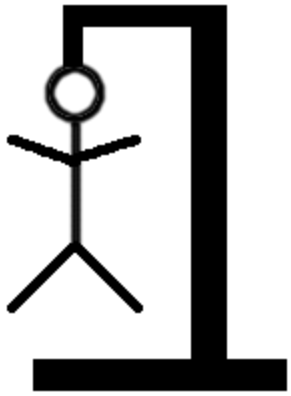
Hangman



Project 2

CSC – 5 #43952 Intro C++

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Instructor: Professor M. Lehr

Content

Lines of code: 324

1. Introduction

Rules and Gameplay

Hangman is a guessing game for two or more players. One player thinks of a word, phrase or sentence and the other tries to guess it by suggesting letters or numbers. The word to guess is represented by a row of dashes, representing each letter of the word. Words you cannot use include proper nouns such as names, places, and brands. If the guessing player suggests a letter which occurs in the word, the other player writes it in all its correct positions. If the suggested letter or number does not occur in the word, the other player draws one element of a hanged man stick figure as a tally mark. The game is over when:

- The guessing player completes the word, or guesses the whole word correctly
- The other player completes the diagram of "Hangman"

Strategy for the Game

A common strategy is to guess vowels first, as English only has six vowels (a, e, i, o, u and y), and almost every word has at least one.

Run through Example: Word = HANGMAN

Word: _ _ _ _ _ _ _

Guess: e

Misses:

Guess #1

Word: _ _ _ _ _ _ _

Guess: t

Misses: E

Guess #2

Word: _ _ _ _ _ _ _

Guess: a

Misses: e,t

Guess #3

Word: _ **a** _ _ _ **a** _

Guess: o

Misses: e,t

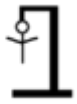
Guess #4

Word: _ **a** _ _ _ **a** _

Guess: i

Misses: e,o,t

Guess #5



Guess #6

Word: **_ a _ _ _ a_**
Guess: s
Misses: e,i,o,t

Word: **_ a _ _ _ a _**
Guess: n
Misses: e,i,o, s,t

Guess #7

Word: **_ a n _ _ a n**
Guess: h
Misses: e,i,o,s,t

Guess #8

Word: **h a n _ _ a n**
Guess: r
Misses: e,i,o,s,t

Guess #9

Word: **h a n _ _ a n**
Guess: z
Misses: e,i,o,r,s,t

Guess #10

(Number of guess has reached limit)

Player lost the game - the correct word was “HANGMAN”.

Personal thoughts on Game

I think the game is pretty straight forward and simple. The main ability the player need is a strategy of guessing because the next guess is based on the result of the previous guesses.

The player needs to use the previous results and cross comparison to inference the right letter. Therefore, the main goal is to guess the correct word within a category in the game.

2. Useful Major Tools Information

I. **Arrays**

An array is a series of elements of the same type placed in contiguous memory locations that can be individually referenced by adding an index to a unique identifier. For example, five values of type “int” can be declared as an array without having to declare 5 different variables (each with its own identifier). Instead, using an array, the five “int” values are stored in contiguous memory locations, and all five can be accessed using the same identifier, with the proper index. Example of an array from my project:

```
string music[SIZE] = {
"rock", "hiphop", "pop", "folk", "classical", "jazz", "alternative", "blues","punk",
"country" };
```

II. Parallel Array

A group of parallel arrays is a data structure for representing arrays of records. It keeps a separate, homogeneous array for each field of the record, each having the same number of elements. Then, objects located at the same index in each array are implicitly the fields of a single record. Pointers from one object to another are replaced by array indices. This contrasts with the normal approach of storing all fields of each record together in memory.

This is an example of a **parallel array** that I used in my project:

```
for (int i = 0; i< word.length(); i++){
        if (guess == word[i]){
            unknown[i] = guess;
            match=true;
                }
}
```

III. 2 Dimensional Array

A two-dimensional array is, in essence, a list of one-dimensional arrays. A two-dimensional array can be think as a table, which will have “x” number of rows and “y” number of columns. Think of it like a matrix in math. These are the examples that I used in my program:

- char record[COL][COL];
-
```
for(int i=0;i<COL;i++){
    for(int j=0;j<26;j++){
      record[i][j]='_'; //2D array print out unrevealed word
            }
        }
```

IV. String Length

String length returns the length of the string, in terms of bytes. This is the number of actual bytes that conforms the contents of the string. One example that I used in my project is (see it in red):

```
for(int i=0;i<word.length();i++){
    unknown+="-";
  }
```

V. **Loops**

A loop is a way of repeating a statement a number of times until some way of ending the loop occurs. It might be run for a preset number of times, typically in a “for loop”, repeated as long as an expression is true (a “while loop”) or repeated until an expression becomes false in a “do while loop”. In this project, I utilized a “for” loop and a “do while” loop. Here is one of example of loops that I utilized in my program:

For Loop: for(int i=0;i<word.length();i++){

```
unknown+="-";
}
```

VI. **Function Prototype**

A function prototype is a declaration of a function that specifies the function's name and type signature (parameter types, return type, etc), but omits the function body. Elsewhere in the program, a function definition must be provided if one wishes to use this function. There is another function that acts differently as a function prototype, which is called the **void function**. A function with void result type ends either by reaching the end of the function or by executing a return statement with no returned value. In other words, the function takes no arguments. It's important to be aware that a declaration of a function does not need to include any arguments. In this program, my function prototypes are:

- **bool** letFill (char, string, string&) →Letter Fill function
- **void** getWord (string [], string &, string &) → Unknown word function
- **float** percent (int, int) → guessing accuracy percentage in decimal

- **void** display(int) → to display the "HANGMAN"
- **bool** valid(char , string) → Input validation
- **void** showAry(int [], char [], char[][COL], int total_try, int unknown_length) → To print the array
- **void** sortAry(int [], char [], char[][COL], int, int) → Sorting the array

VII. String

String class is a standard representation for a text string. In this project, I utilized string combined with an array, which stores the unknown words that the guesser has to guess in the game. One of the examples from my project:

```
string sports[SIZE] = {
        "football", "swimming", "soccer", "basketball", "cricket", "baseball", "running",
        "tennis", "badminton", "racing" };
```

3. List of Variables

Data Type	Variable Name	Description	Line
int	count	To count the number of guess, then display hangman	323
	nWrong=0	Initializing the number of wrong guesses	35
	choice	Type 1, 2, or 3 to pick a category	104
	atmpt	Number of guess attempted	391
	max	Number of max. tries	391

	itemp	Temporary integer	417
	length	The length of unknown word in sort array	414
	tryArr[COL]	number of tries in array	40
	ttlTry=1	Initialize the number of tries	41
const int	MaxTRY=8	Initialize the number of maximum tries	33
	SIZE=10	Size of an array is 10	37
	COL=26	size of 2D array	20
char	letter	Input a letter to guess the word	34
	guess	Our number of guess	293
	inputAr[COL]	For the input	38
	record[COL][COL]	Record of unknown and number of tries	39
	temp	Temporary variable	416
string	word	The unknown word that we are trying to guess	36
	words[SIZE]	Country names category stored in an array	51
	sports[SIZE]	Sports category stored in an array	64
	music[SIZE]	Music genre category stored in an array	77
	unknown	The unknown word	90
	temp	Temporary variable is declared in order to help input the file	94
	output=""	Starts as a blank string. Then, when we do	405

		the for loop, it'll just add the 2D array for 'record'	
float	percent()	Gamer's guessing accuracy in decimal	391
bool	match=false	Initialize if the answer matches as false	295
	swap	To swap	415
fstream	input	Input stream (open file)	92
	output	Output stream (close file)	311

4. Covered Topics (Checklist)

Chapter	Type	Code	line
2.1 Variables	int	int nWrng=0;	32
2.2 Input Output	cin	cin>>letter;	115
	cout	cout<<unknown<<endl;	126
2.3 Data Types	char	char letter;	31
	bool	bool match=false;	231
	string	string word;	33
2.4 Condition	=	Int nWrng=0;	32

	==	if (count==1)	255
	++	i++;	249
2.5 Style	comment	//choose and copy a word from array of words randomly	241
3.1 Expression	>, &&, !=	while(nWrng<MaxTRY && word!=unknown){	134, 176, 218
3.2 Multiway branches	switch	switch(choice){	106
	if	(letFill(letter, word, unknown)==false){	118
	else	else{ cout<<endl<< "Yes! You found a letter, keep going!" <<endl; }	123-125
	nested	for (int i = 0; i< word.length(); i++){	232
		do{	95
	break	break;	219
3.3 Type of Loop	for	for(int i=0;i<word.length();i++){	249
	do-while	do{} while(choice>=1 && choice<=3);	225
4.2 Predefined Function	srand, time	srand (time(0));	39
	rand	word=arr[rand()%10];	242
4.3 Function Prototypes	float	float percent ();	322

5.1 Void Function	void	void display();	254
5.2 Call-by-reference	&	void getWord(string arr[], string &word, string &unknown);	240
6.1 Streams and Basic	fstream declare	fstream output;	243
	output	output.open("word.txt", ios::out);	244
	close	output.close();	246
7.1 Array	string array	string words[SIZE]	40
7.4 Array Initialization	const int	const int SIZE=10	37

	string	string sports[SIZE] = {
		"football",
		"swimming",
		"soccer",
		"basketball",
		"cricket",
		"baseball",
		"running",
		"tennis",
		"badminton",
		"racing"
		};
			64

7.5 Processing Array	string	output+=record[i][j]	403

Contents			

7.6 Using Parallel Arrays	char	if (guess == word[i]){
		unknown[i] = guess;
		match=true;
		}
			297

7.7 Arrays as Function Arguments	string array	void getWord(string arr[], string &word, string &unknown)	304
7.8 Two Dimensional Arrays	char	char record[COL][COL]	39

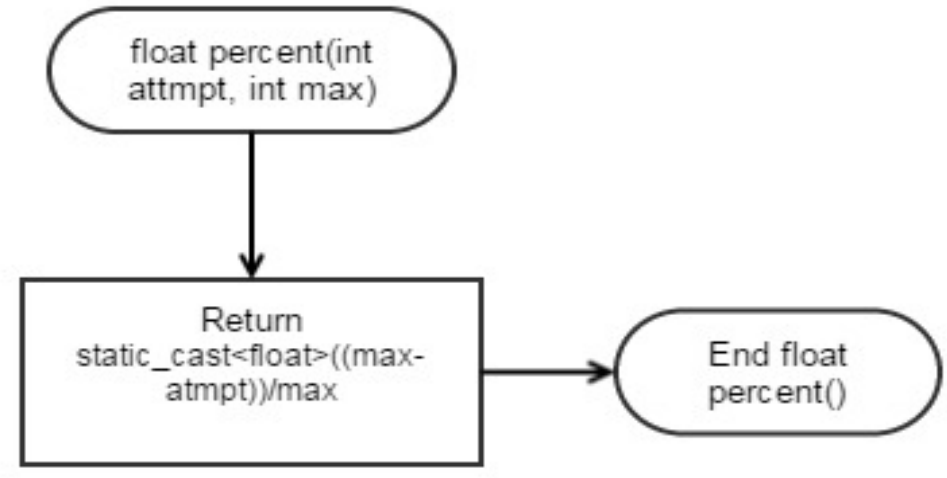
7.9 Array of Strings	string	string music[SIZE] = {
		"rock",
		"hiphop",
		"pop",
		"folk",
		"classical",
		"jazz",
		"alternative",
		"blues",
		"punk",
		"country"
		};
			77

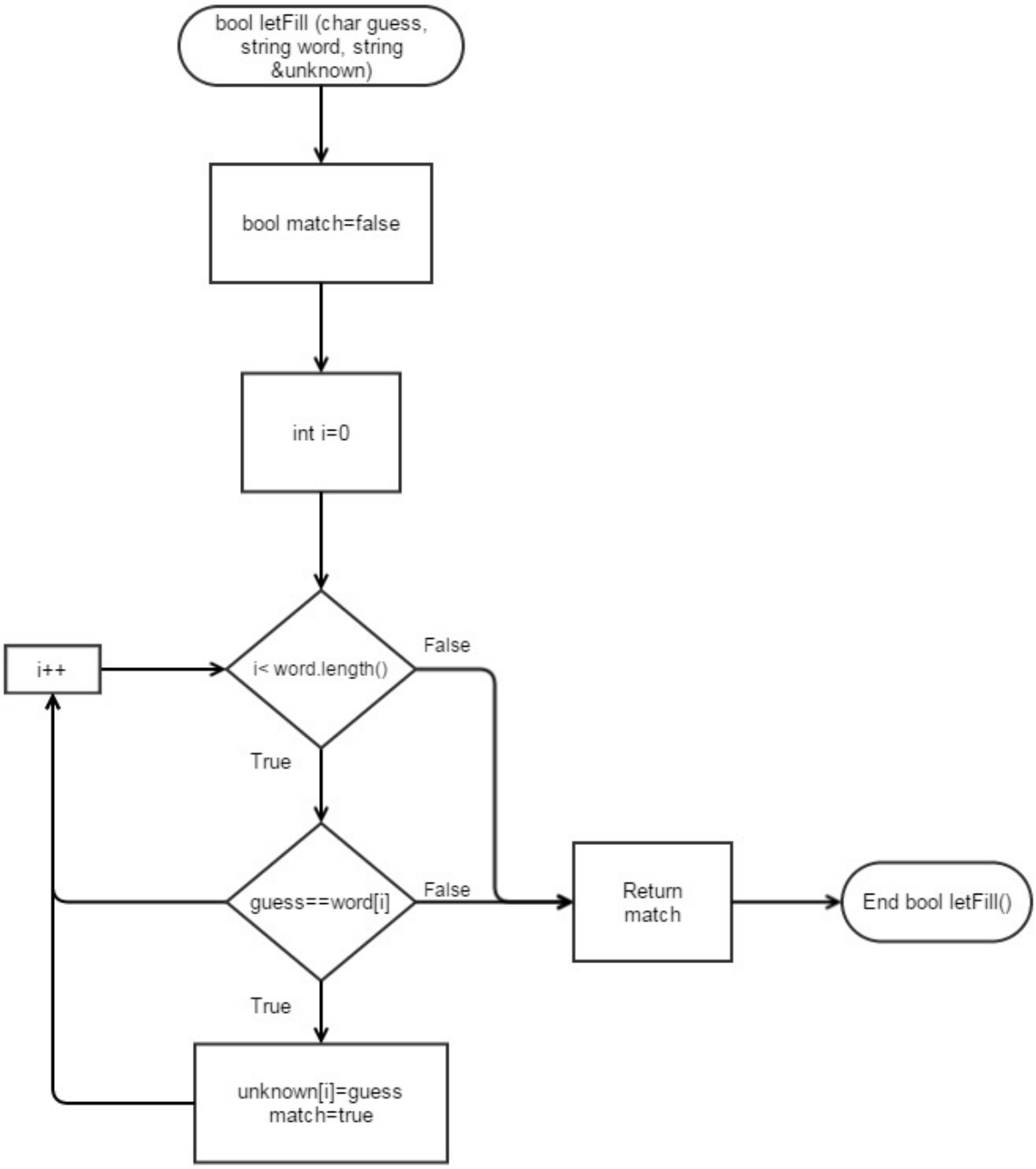
5. Libraries included

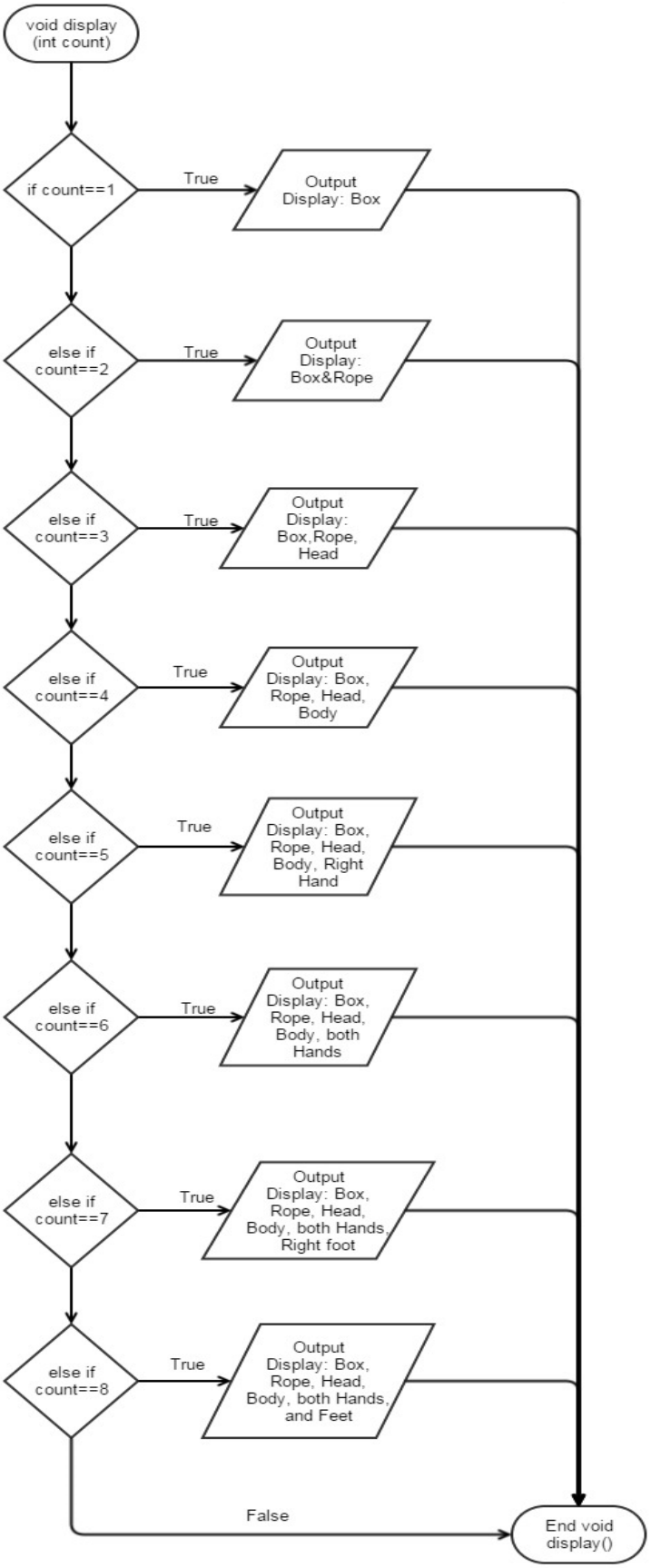
- #include <string>
- #include <iostream>
- #include <cstdlib>
- #include <ctime>
- #include <iomanip>
- #include <fstream>

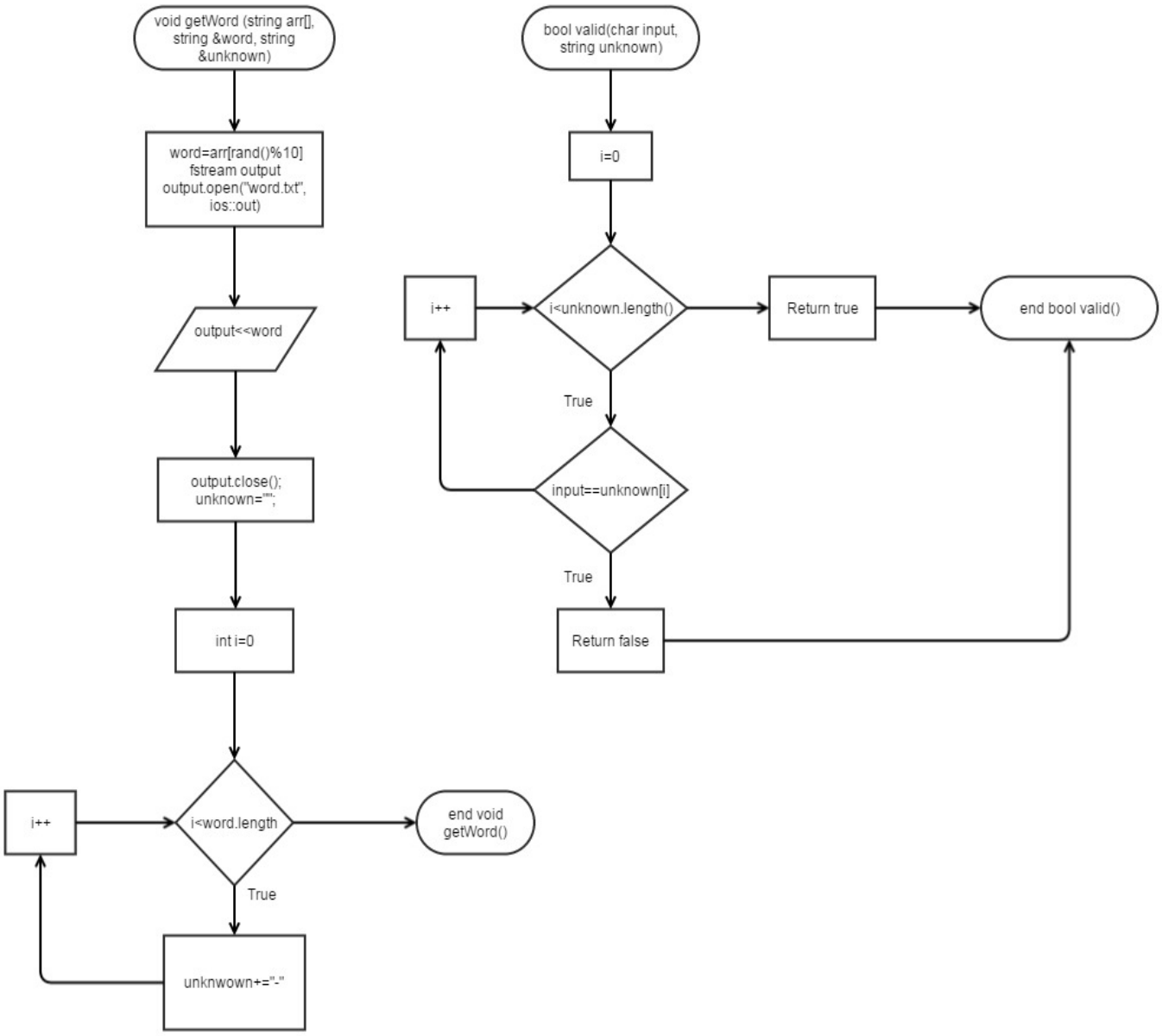
6. Flowchart

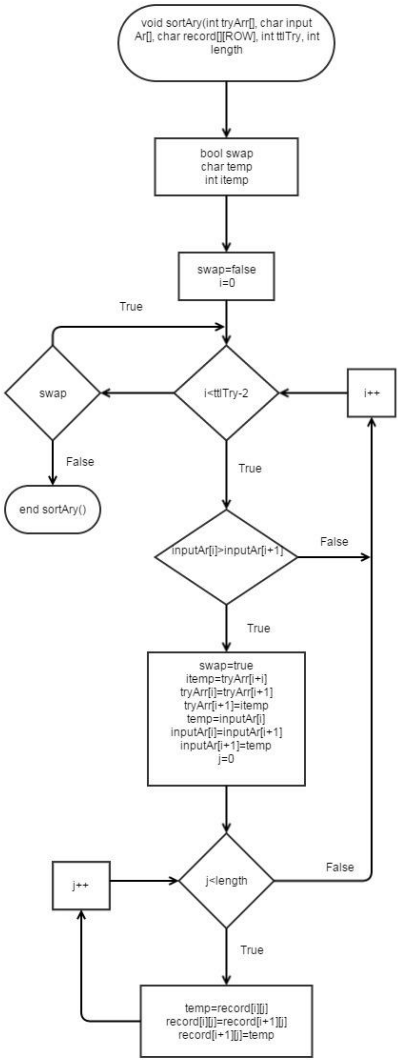
- Function Prototypes

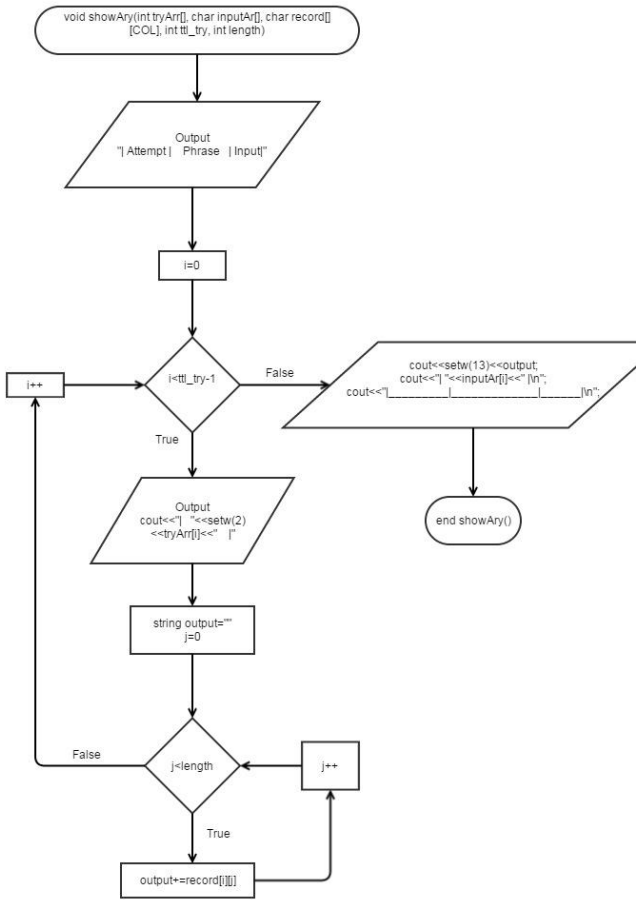



bool letFill (char guess, string word, string &unknown)
bool match=false
int i=0
i< word.length()
False
i++
True
guess==word[i]
False
Return match
End bool letFill()
True
unknown[i]=guess
match=true

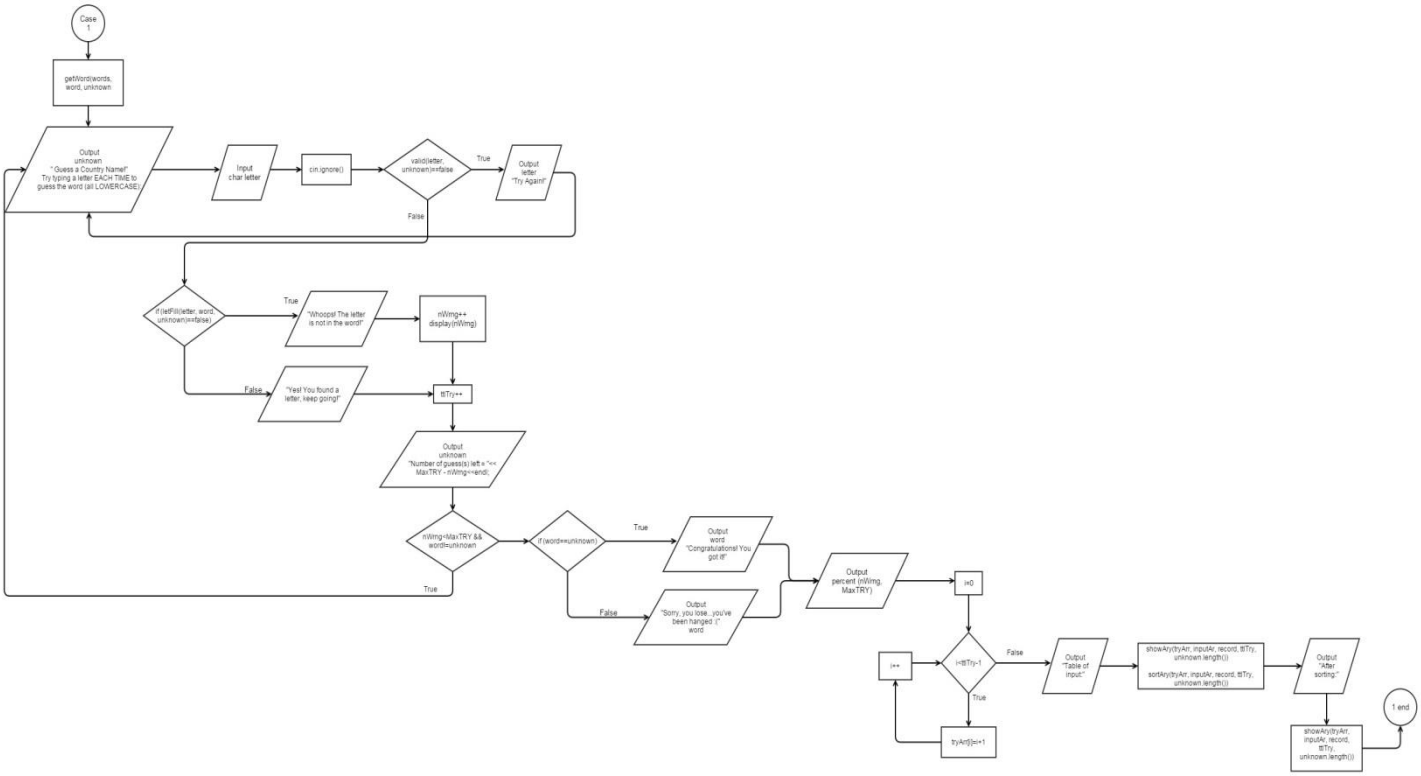

void display (int count)
if count==1
True
Output Display: Box
else if count==2
True
Output Display: Box&Rope
else if count==3
True
Output Display: Box,Rope, Head
else if count==4
True
Output Display: Box, Rope, Head, Body
else if count==5
True
Output Display: Box, Rope, Head, Body, Right Hand
else if count==6
True
Output Display: Box, Rope, Head, Body, both Hands
else if count==7
True
Output Display: Box, Rope, Head, Body, both Hands, Right foot
else if count==8
True
Output Display: Box, Rope, Head, Body, both Hands, and Feet
False
End void display()


void getWord (string arr[], string &word, string &unknown)
word=arr[rand()%10]
fstream output
output.open("word.txt", ios::out)
output<<word
output.close();
unknown="";
int i=0
i++
i<word.length
True
unknwown+="-"
end void getWord()
bool valid(char input, string unknown)
i=0
i++
i<unknown.length()
Return true
end bool valid()
True
input==unknown[i]
True
Return false

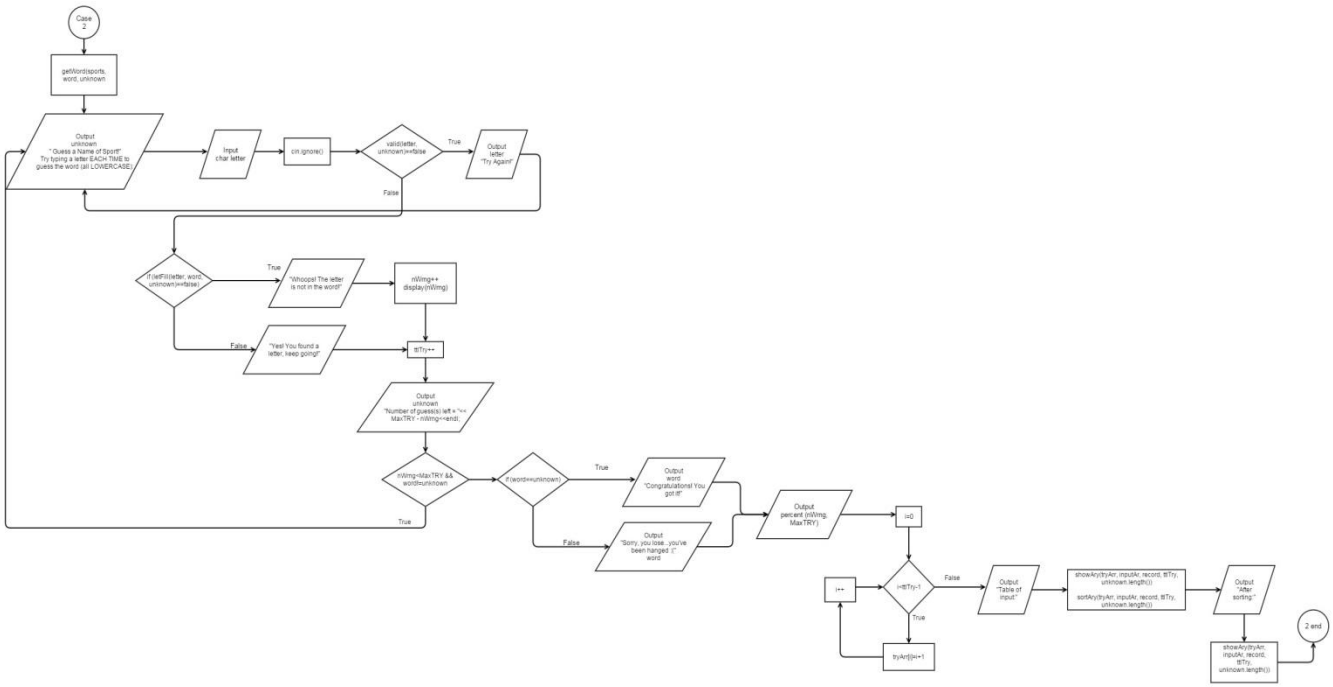

void sortAry(int tryArr[], char input Ar[], char record[][ROW], int ttlTry, int length
bool swap
char temp
int itemp
swap=false
i=0
True
swap
i<ttlTry-2
i++
False
True
end sortAry()
inputAr[i]>inputAr[i+1]
False
True
swap=true
itemp=tryArr[i+i]
tryArr[i]=tryArr[i+1]
tryArr[i+1]=itemp
temp=inputAr[i]
inputAr[i]=inputAr[i+1]
inputAr[i+1]=temp
j=0
j++
j<length
False
True
temp=record[i][j]
record[i][j]=record[i+1][j]
record[i+1][j]=temp


void showAry(int tryArr[], char inputAr[], char record[][COL], int ttl_try, int length)
Output
"| Attempt | Phrase | Input|"
i=0
i++
i<ttl_try-1
False
cout<<setw(13)<<output;
cout<<"| "<<inputAr[i]<<" |\n";
cout<<"|_____|_____|_____|\n";
True
end showAry()
Output
cout<<"| "<<setw(2)
<<tryArr[i]<<" |"
string output=""
j=0
False
j<length
j++
True
output+=record[i][j]

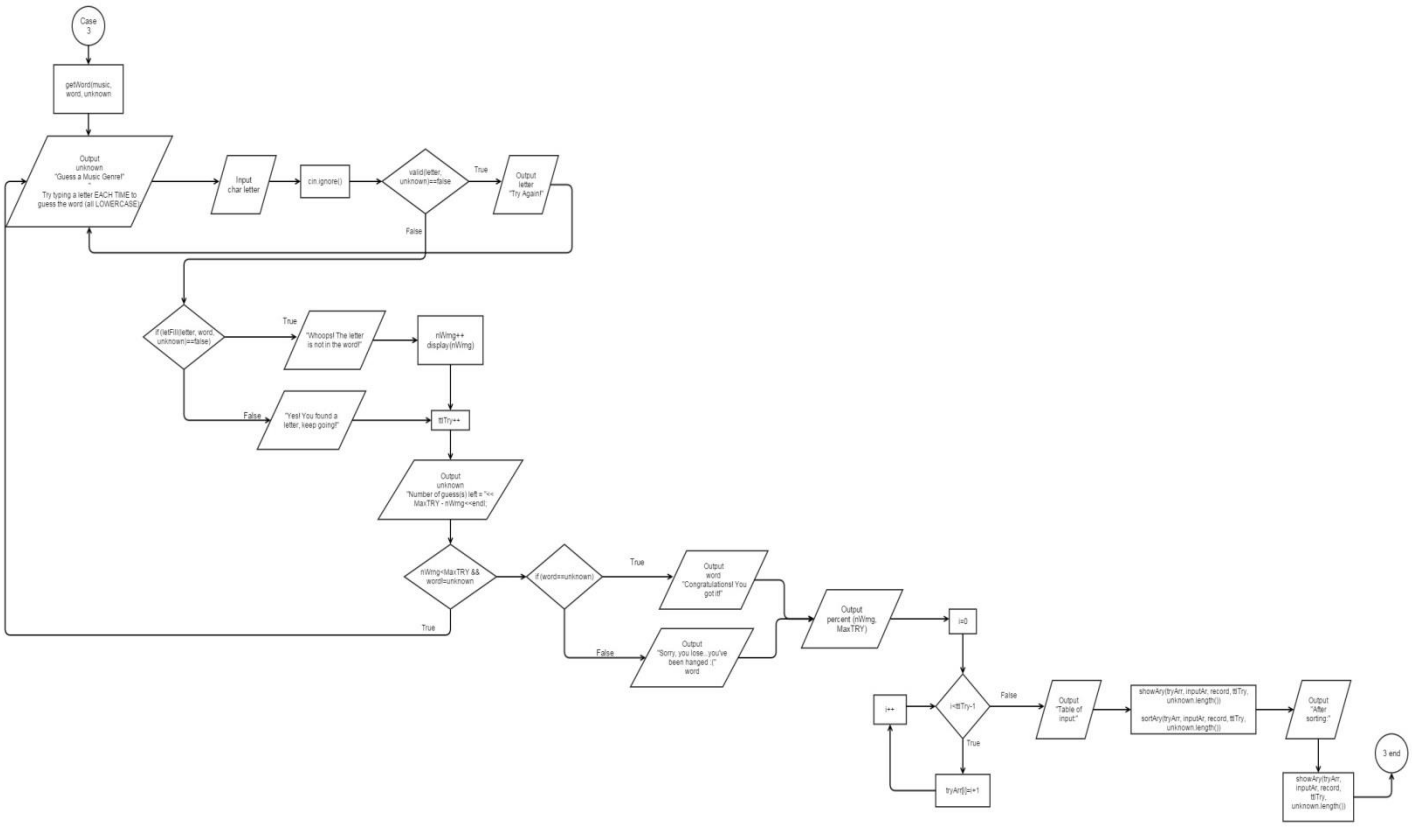
- Case 1


Case 1
getWord(words, word, unknown
Output unknown " Guess a Country Name!" Try typing a letter EACH TIME to guess the word (all LOWERCASE)
Input char letter
cin.ignore()
valid(letter, unknown)=false
True
Output letter "Try Again!"
False
if (isFill(letter, word, unknown)=false)
True
"Whoops! The letter is not in the word!"
nWmg++ display(nWmg)
False
"Yes! You found a letter, keep going!"
tlTry++
Output unknown "Number of guess(s) left a "<< MaxTRY - nWmg<<endl;
nWmg<MaxTRY && word!=unknown
if (word==unknown)
True
Output word "Congratulations! You got it!"
False
Output "Sorry, you lose.. you've been hanged :(" word
Output percent (nWmg, MaxTRY)
i=0
i<tlTry-1
False
True
i++
tryArr[i]=i+1
Output "Table of input:"
showAry(tryArr, inputAr, record, tlTry, unknown.length())
sortAry(tryArr, inputAr, record, tlTry, unknown.length())
Output "After sorting:"
showAry(tryArr, inputAr, record, tlTry, unknown.length())
1 end

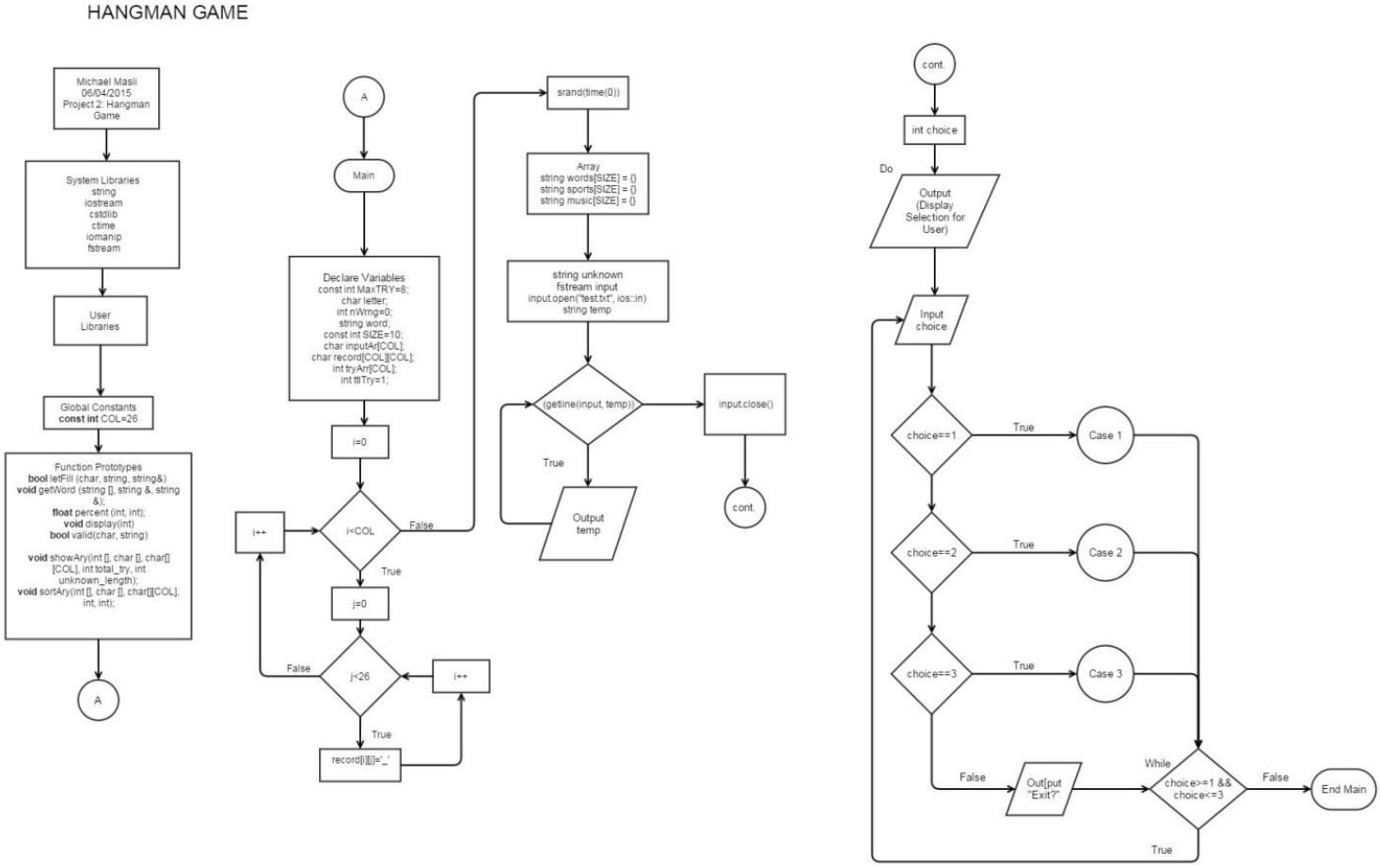
- Case 2


Case 2
getWord(sports, word, unknown
Output unknown " Guess a Name of Sport!" Try typing a letter EACH TIME to guess the word (all LOWERCASE)
Input char letter
cin.ignore()
valid(letter, unknown)=false
True
Output letter "Try Again!"
False
if (isFill(letter, word, unknown)=false)
True
"Whoops! The letter is not in the word!"
nWmg++ display(nWmg)
False
"Yes! You found a letter, keep going!"
tlTry++
Output unknown "Number of guess(s) left a "<< MaxTRY - nWmg<<endl;
nWmg<MaxTRY && word!=unknown
if (word==unknown)
True
Output word "Congratulations! You got it!"
False
Output "Sorry, you lose.. you've been hanged :(" word
Output percent (nWmg, MaxTRY)
i=0
i<tlTry-1
False
True
i++
tryArr[i]=i+1
Output "Table of input:"
showAry(tryArr, inputAr, record, tlTry, unknown.length())
sortAry(tryArr, inputAr, record, tlTry, unknown.length())
Output "After sorting:"
showAry(tryArr, inputAr, record, tlTry, unknown.length())
2 end

- Case 3


Case 3
getWord(music, word, unknown
Output unknown "Guess a Music Genre!" " Try typing a letter EACH TIME to guess the word (all LOWERCASE)
Input char letter
cin.ignore()
valid(letter, unknown)==false
True
Output letter "Try Again!"
False
if (!wFill(letter, word, unknown)==false)
True
"Whoops! The letter is not in the word!"
nWrng++ display(nWrng)
False
"Yes! You found a letter, keep going!!"
ttTry++
Output unknown "Number of guesss(s) left = "<< MaxTRY - nWrng<<endl;
nWrng=MaxTRY && word!=unknown
True
if (word==unknown)
True
Output word "Congratulations! You got it!"
False
Output "Sorry, you lose...you've been hanged :(" word
Output percent (nWrng, MaxTRY)
i=0
i++
i<ttTry-1
False
True
tryArr[]=i+1
Output "Table of input:"
showAry(tryArr, inputAr, record, ttTry, unknown.length())
sortAry(tryArr, inputAr, record, ttTry, unknown.length())
Output "After sorting:"
showAry(tryArr, inputAr, record, ttTry, unknown.length())
3 end

- Main


HANGMAN GAME
Michael Masli
06/04/2015
Project 2: Hangman Game
System Libraries
string
iostream
cstdlib
ctime
iomanip
fstream
User Libraries
Global Constants
const int COL=26
Function Prototypes
bool letFill (char, string, string&)
void getWord (string [], string &, string &);
float percent (int, int);
void display(int)
bool valid(char, string)
void showAry(int [], char [], char[][COL], int total_try, int unknown_length);
void sortAry(int [], char [], char[][COL], int, int);
A
A
Main
Declare Variables
const int MaxTRY=8;
char letter;
int nWrng=0;
string word;
const int SIZE=10;
char inputAr[COL];
char record[COL][COL];
int tryArr[COL];
int ttlTry=1;
i=0
i<COL
False
True
i++
j=0
j<26
False
True
i++
record[i][j]='_'
srand(time(0))
Array
string words[SIZE] = {}
string sports[SIZE] = {}
string music[SIZE] = {}
string unknown
fstream input
input.open("test.txt", ios::in)
string temp
(getline(input, temp))
True
Output temp
input.close()
cont.
cont.
int choice
Do
Output (Display Selection for User)
Input choice
choice==1
True
Case 1
choice==2
True
Case 2
choice==3
True
Case 3
False
Out[put "Exit?"
While
choice>=1 && choice<=3
False
End Main
True

7. Programming Code

```
/*
 * File:   main.cpp
 * Author: Michael Masli
 *
 * Created on May 25, 2015, 14:32 AM
 * Purpose: Hangman Game
 */
//User Libraries

//System Libraries
#include <string>
#include <iostream>
#include <cstdlib>
#include <ctime>
#include <iomanip>
#include <fstream>
using namespace std;

//Global Constants
const int COL=26; //size of 2d array (alphabet characters = 26 letters)
//Function Prototypes
bool letFill (char, string, string&, int, char[][COL]); //Letter Fill function
void getWord (string [], string &, string &); //'&' call by referrence
float percent (int, int); // guessing accuracy percentage in decimal
void display(int); //display hangman
bool valid(char, string);   //input validation
//Display input array and 2d record array
void showAry(int [], char [], char[][COL], int total_try, int unknown_length);
void sortAry(int [], char [], char[][COL], int, int);
//Execution Begins Here
int main (int argc, char** argv){
   //Declare Variables
   const int MaxTRY=8; //number of maximum tries
   char letter; // input the letter to guess the word
   int nWrng=0; //num. of wrong guesses
   string word;
   const int SIZE=10; //size of array
   char inputAr[COL]; //1D array (new))
   char record[COL][COL]; //record of unknown and try 2D (new)
   int tryArr[COL]; //new
```

```
int ttlTry=1; //initialize number of try (new)
cout<<setprecision(2)<<fixed<<showpoint; //decimal format
//New Loop (for the "unknown" unrevealed word)
for(int i=0;i<COL;i++){
   for(int j=0;j<26;j++){
      record[i][j]='_'; //2D array print out unrevealed unknown word
   }
}
//set the random time seed
srand(time(0));
string words[SIZE] = {
   "china",
   "germany", //7
   "england", //
   "netherlands", //9
   "philippines",
   "australia",
   "turkey",
   "greece",
   "uganda",
   "indonesia"
};

string sports[SIZE] = {
   "football",
   "swimming",
   "soccer",
   "basketball",
   "cricket",
   "baseball",
   "running",
   "tennis",
   "badminton",
   "racing"
};

string music[SIZE] = {
   "rock",
   "hiphop",
   "pop",
   "folk",
   "classical",
   "jazz",
   "alternative",
```

```
      "blues",
      "punk",
      "country"
   };

         string unknown; //for the unknown word
      //Input file
      fstream input;
      input.open("test.txt", ios::in);
      string temp;
      while(getline(input, temp))cout<<temp<<endl;
      input.close();
         //Prompt the User
//       cout<<"Hello there! Welcome to HANGMAN...Guess the correct word."<<endl; //Modify
this, to "select a category
//       cout<<"Each letter is represented by the character '-' "<<endl;
//       cout<<"You get to type a letter in each try."<<endl;
//       cout<<"You have 8 tries to guess the correct word in the selected category."<<endl;

   //Menu format
   int choice;
      //Repeat the menu
   do{
      nWrng=0;
      //General Menu Format
      //Display the selection
      cout<<"\nType 1 to guess a country name."<<endl;
      cout<<"Type 2 to guess a name of sport."<<endl;
      cout<<"Type 3 to guess a music genre."<<endl;
      cout<<"Type anything else to quit playing this game."<<endl;
      //Read the choice
      cin>>choice;
      cin.ignore();
      //Solve a problem that has been chosen.
      switch(choice){
            case 1:{
               getWord(words, word, unknown);
               //Loop until the guesses are used up
               do{
                  //cout<<"\ntotal try = "<<ttlTry<<endl;
                  //Input Validation
                  do{
                     cout<<"\n"<< unknown;
```

```
                cout<<"\nGuess a Country Name!\nTry typing a letter EACH TIME to guess the
word (all LOWERCASE): ";
                cin>>letter;
                cin.ignore();
                if(valid(letter, unknown)==false)cout<<"Letter '"<<letter<<"' was input before,
try again!\n";
            }while(valid(letter, unknown)==false);
            inputAr[ttlTry-1]=letter;
            //Conditions
            if (letFill(inputAr[ttlTry-1], word, unknown, ttlTry, record)==false){
                cout<<endl<< "Whoops! The letter is not in the word!"<<endl;
                nWrng++;
                display(nWrng);
            }
            else{
                cout<<endl<< "Yes! You found a letter, keep going!" <<endl;
            }
            ttlTry++; //increment ttl try (new)
            //cout<<unknown<<endl;
            //Inform the user for how many guess the user has
            cout<<"Number of guess(s) left = "<< MaxTRY - nWrng;

            // Check if user guessed the word.

        }while(nWrng<MaxTRY && word!=unknown);
        if (word==unknown){
            cout <<"\nThe word is "<<word<<endl;
            cout << "Congratulations! You got it!"<<endl;
            }
        else{
            cout << "\nSorry, you lose...you've been hanged :(" << endl;
            cout << "The correct word was : " << word << endl;
        }
        //cout<<nWrng<<" "<<MaxTRY<<endl;
        cout<<"Your guessing accuracy in decimal point is "<<percent(nWrng,
MaxTRY)<<endl;

        for(int i=0;i<ttlTry-1;i++){ //new loop
            tryArr[i]=i+1;
        }
        //Show the Array (new)
        cout<<"Table of input: "<<endl;
        showAry(tryArr, inputAr, record, ttlTry, unknown.length());
        //Sort the Array
```

```
            sortAry(tryArr, inputAr, record, ttlTry, unknown.length());
            cout<<"After Sorting:\n";
            showAry(tryArr, inputAr, record, ttlTry, unknown.length()); //Show the array after
sorting

            break;
         }

         case 2:{
            getWord(sports, word, unknown);

             //Loop until the guesses are used up
            do{
               //Input Validation
               do{
                  cout<<"\n"<< unknown;
                  cout<<"\nGuess a Name of Sport\nTry typing a letter EACH TIME to guess the
word (all LOWERCASE): ";
                  cin>>letter;
                  cin.ignore();
                  if(valid(letter, unknown)==false)cout<<"Letter '"<<letter<<"' was input before,
try again!\n";
               }while(valid(letter, unknown)==false);
               inputAr[ttlTry-1]=letter;
               //Conditions
            if (letFill(inputAr[ttlTry-1], word, unknown, ttlTry, record)==false){
                  cout<<endl<< "Whoops! The letter is not in the word!"<<endl;
                  nWrng++;
                  display(nWrng);
            }
            else{
                  cout<<endl<< "Yes! You found a letter, keep going!" <<endl;
            }
            ttlTry++;
            //cout<<unknown<<endl;
            //Inform the user for how many guess the user has
            cout<<"Number of guess(s) left = "<< MaxTRY - nWrng;

            // Check if user guessed the word.

            }while(nWrng<MaxTRY && word!=unknown);
            if (word==unknown){
                  cout <<"\nThe word is "<<word<<endl;
                  cout << "Congratulations! You got it!"<<endl;
```

```
            }
            else{
                cout << "\nSorry, you lose...you've been hanged :(" << endl;
                cout << "The correct word was : " << word << endl;
            }

            //cout<<nWrng<<" "<<MaxTRY<<endl;
            cout<<"Your guessing accuracy in decimal point is "<<percent(nWrng,
MaxTRY)<<endl;

            for(int i=0;i<ttlTry-1;i++){
              tryArr[i]=i+1;
            }
            //Show the Array
            cout<<"Table of input: "<<endl;
            showAry(tryArr, inputAr, record, ttlTry, unknown.length());
            //Sort the Array
            sortAry(tryArr, inputAr, record, ttlTry, unknown.length());
            cout<<"After Sorting:\n";
            showAry(tryArr, inputAr, record, ttlTry, unknown.length()); //Show the array after
sorting
            break;
          }
          case 3:{

            getWord(music, word, unknown); //getWord--> randomly pick word from music
array

            //Loop until the guesses are used up
            do{
              //Input Validation
              do{
                cout<<"\n"<< unknown;
                cout<<"\nGuess a name of Music Genre!\nTry typing a letter EACH TIME to
guess the word (all LOWERCASE): ";
                cin>>letter;
                cin.ignore();
                if(valid(letter, unknown)==false)cout<<"Letter '"<<letter<<"' was input before,
try again!\n";
              }while(valid(letter, unknown)==false);
            //Conditions
              inputAr[ttlTry-1]=letter;
            if (letFill(inputAr[ttlTry-1], word, unknown, ttlTry, record)==false){
                cout<<endl<< "Whoops! The letter is not in the word!"<<endl;
```

```
                nWrng++;
                display(nWrng);
            }
            else{
                cout<<endl<< "Yes! You found a letter, keep going!" <<endl;
            }
            ttlTry++; //increment ttl try
            //cout<<unknown<<endl;
            //Inform the user for how many guess the user has
            cout<<"Number of guess(s) left = "<< MaxTRY - nWrng;

            // Check if user guessed the word.

            }while(nWrng<MaxTRY && word!=unknown);
            if (word==unknown){
                cout <<"\nThe word is "<<word<<endl;
                cout << "Congratulations! You got it!"<<endl;
              }
            else{
                cout << "\nSorry, you lose...you've been hanged :(" << endl;
                cout << "The correct word was : " << word << endl;
            }
            //cout<<nWrng<<" "<<MaxTRY<<endl;
            cout<<"Your guessing accuracy in decimal point is "<<percent(nWrng,
MaxTRY)<<endl;
            for(int i=0;i<ttlTry-1;i++){
              tryArr[i]=i+1;
            }
            //Show the Array
            cout<<"Table of input: "<<endl;
            showAry(tryArr, inputAr, record, ttlTry, unknown.length());
            //Sort the Array
            sortAry(tryArr, inputAr, record, ttlTry, unknown.length());
            cout<<"After Sorting:\n";
            showAry(tryArr, inputAr, record, ttlTry, unknown.length()); //Show the array after
sorting
            break;
          }
          default:{
                cout<<"Exit?"<<endl;
          }
      }
  } while(choice>=1 && choice<=3);
  //Exit Stage Right
```

```
   return 0;
}
//The function of changing unknown
bool letFill (char guess, string word, string &unknown, int ttlTry, char record[][COL]){
  cout<<"guess = "<<guess<<endl;
   bool match=false;
   for (int i = 0; i< word.length(); i++){ //word.length = how many characters are in side
         if (guess == word[i]){     //parallel array same index for word and unknown
               unknown[i] = guess;
               match=true;
         }
   }
   //add unknown to record
   for(int j=0;j<unknown.length();j++){
      record[ttlTry-1][j]=unknown[j]; //num of input variable is what? change it
   }
   return match;
}
void getWord(string arr[], string &word, string &unknown){
   //choose and copy a word from array of words randomly
   word=arr[rand()%10];
   fstream output;
   output.open("word.txt", ios::out);
   output<<word;
   output.close();
   unknown="";
   //Initialize the unkn word with the "-" character.
   for(int i=0;i<word.length();i++){
      unknown+="-";
   }
   //cout<<word;
}
//Function that displays hangman
void display(int count){
   if(count==1){
      cout<<"_____\n";
      cout<<"|          |\n";
      cout<<"|          |\n";
      cout<<"|          |\n";
      cout<<"|          |\n";
      cout<<"|_____|\n";
   }
   else if(count==2){
      cout<<"_____\n";
```

```
    cout<<"|            |          |\n";
    cout<<"|                       |\n";
    cout<<"|                       |\n";
    cout<<"|                       |\n";
    cout<<"|_____________________________|\n";
}
else if(count==3){
    cout<<"_____________________________\n";
    cout<<"|            |          |\n";
    cout<<"|            O          |\n";
    cout<<"|                       |\n";
    cout<<"|                       |\n";
    cout<<"|_____________________________|\n";
}
else if(count==4){
    cout<<"_____________________________\n";
    cout<<"|            |          |\n";
    cout<<"|            O          |\n";
    cout<<"|            |          |\n";
    cout<<"|                       |\n";
    cout<<"|_____________________________|\n";
}
else if(count==5){
    cout<<"_____________________________\n";
    cout<<"|            |          |\n";
    cout<<"|            O          |\n";
    cout<<"|           /|          |\n";
    cout<<"|                       |\n";
    cout<<"|_____________________________|\n";
}
else if(count==6){
    cout<<"_____________________________\n";
    cout<<"|            |          |\n";
    cout<<"|            O          |\n";
    cout<<"|           /|\\           |\n";
    cout<<"|                       |\n";
    cout<<"|_____________________________|\n";
}
else if(count==7){
    cout<<"_____________________________\n";
    cout<<"|            |          |\n";
    cout<<"|            O          |\n";
    cout<<"|           /|\\           |\n";
    cout<<"|           /           |\n";
```

```
      cout<<"|_____|\n";
   }
   else if(count==8){
      cout<<"_____\n";
      cout<<"|      |      |\n";
      cout<<"|      O      |\n";
      cout<<"|     /|\\     |\n";
      cout<<"|     / \\     |\n";
      cout<<"|_____|\n";
      cout<<"YOU JUST LOST!\n";
   }
}

float percent (int atmpt, int max){
   return static_cast<float>((max-atmpt))/max;
}

bool valid(char input, string unknown){
   for(int i=0;i<unknown.length();i++){
      if(input==unknown[i]) return false;
   }
   return true;
}
void showAry(int tryArr[], char inputAr[], char record[][COL], int ttl_try, int length){
   cout<<"| Attempt |    Phrase   | Input|\n";
   for(int i=0;i<ttl_try-1;i++){
      cout<<"|   "<<setw(2)<<tryArr[i]<<"    |";
      string output=""; //starts as a blank string
      for(int j=0;j<length;j++){
         output+=record[i][j];
      }
      cout<<setw(13)<<output;
      cout<<"|  "<<inputAr[i]<<"   |\n";
      cout<<"|_________|_____________|______|\n";
   }
}
void sortAry(int tryArr[], char inputAr[], char record[][COL], int ttlTry, int length){
   bool swap;
   char temp;
   int itemp;
   do{
      swap=false;
      for(int i=0;i<ttlTry-2;i++){
         if(inputAr[i]>inputAr[i+1]){
```

```
            swap=true;
            itemp=tryArr[i];
            tryArr[i]=tryArr[i+1];
            tryArr[i+1]=itemp;
            temp=inputAr[i];
            inputAr[i]=inputAr[i+1];
            inputAr[i+1]=temp;

            for(int j=0;j<length;j++){
               temp = record[i][j];
               record[i][j]= record[i+1][j];
               record[i+1][j] = temp;
            }
         }
      }
   }while(swap);
}
```