Project 2

Title

Random RPG Game

Course

CSC-17A

Section

48130

Due Date

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Author

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Introduction

Title: Random RPG Game

The Random RPG game is a game in which a player moves around a map using the w a s d keys and unexpectedly receives visits from entities trying to kill the player.

The player starts at the center of a map generated by the player and must walk around to get health, bullets, and points.

The player receives points after killing an entity. The more points the player gets, the better.

The player can quit at any time by pressing ‘p’ or going to the pause menu ‘b’ and choosing to exit.

The game is over once the player runs out of health or simply exits the game.

Summary

Project size: 1686 lines
Variables: 17 (in main)
Constructs utilized: 23 (From chapters 9 to 16)

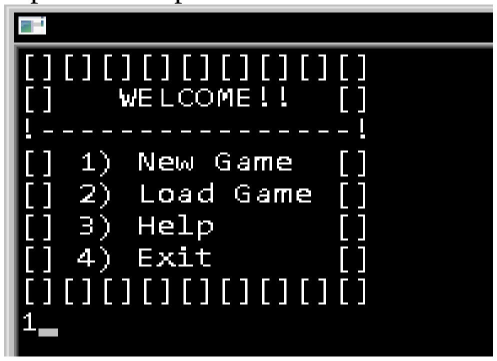
My project meets the criteria for a first project because it uses all the constructs we have learned thus far .My project was a bit challenging since I am used to doing these kinds of projects using dynamic-link libraries and headers from other sources. I also had difficulty using a two-dimensional array (the map) in a single class; the program would always crash upon building the map array. The final problem I had was utilizing the ‘save’ option. I wanted to decrypt the file’s contents and decrypt the file and send the information to the appropriate members and have the members rewritten based on the new information. I could not properly decrypt the file’s name so I could not open the file; thus leading into abandoning the ‘save’ and ‘load’ feature. This project took me about three days to fully complete, excluding the write up and flowchart.

Description

To program the solution to the problem I first made a two-dimensional array and added a character to the center of the screen. Then I incremented the player’s position to make the character appear as if it is walking along the array. After, I added random entities and pickups the player can interact with.

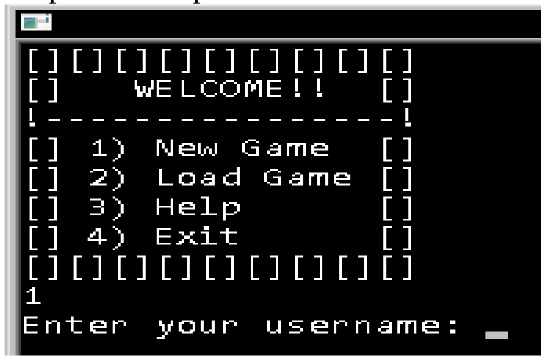
Note: Anything red on the screenshots below are emphasis and not actual in/outputs.

Input menu option 1



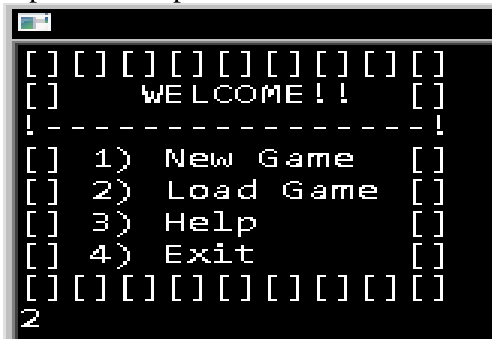
```
[][][][][][][][][]
[]    WELCOME!!   []
!----------------!
[] 1) New Game   []
[] 2) Load Game  []
[] 3) Help       []
[] 4) Exit       []
[][][][][][][][][]
1
```

Output menu option 1



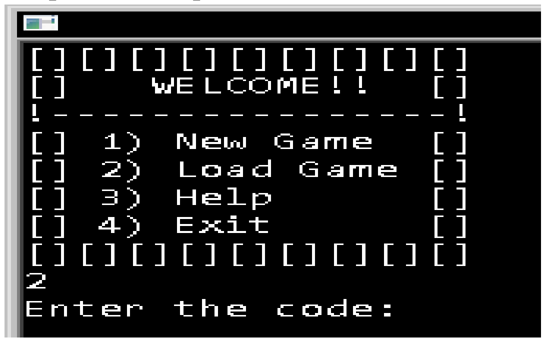
```
[][][][][][][][][]
[]    WELCOME!!   []
!----------------!
[] 1) New Game   []
[] 2) Load Game  []
[] 3) Help       []
[] 4) Exit       []
[][][][][][][][][]
1
Enter your username:
```

Input menu option 2



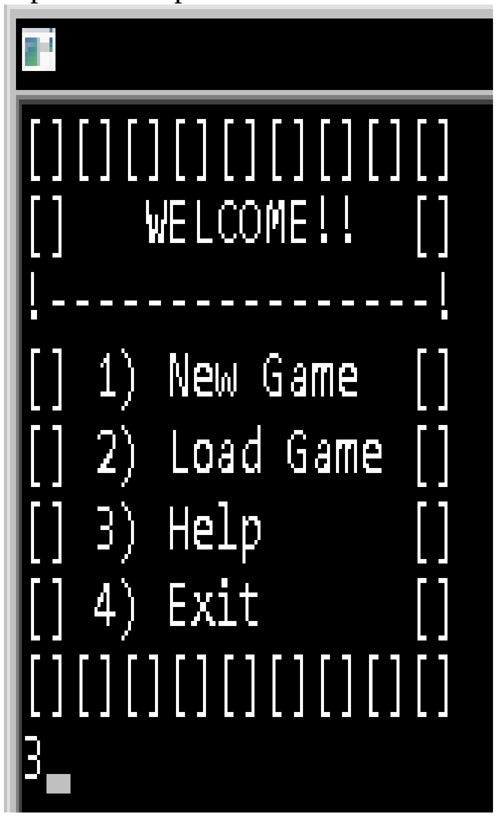
```
[][][][][][][][][]
[]    WELCOME!!   []
!----------------!
[] 1) New Game   []
[] 2) Load Game  []
[] 3) Help       []
[] 4) Exit       []
[][][][][][][][][]
2
```

Output menu option 2



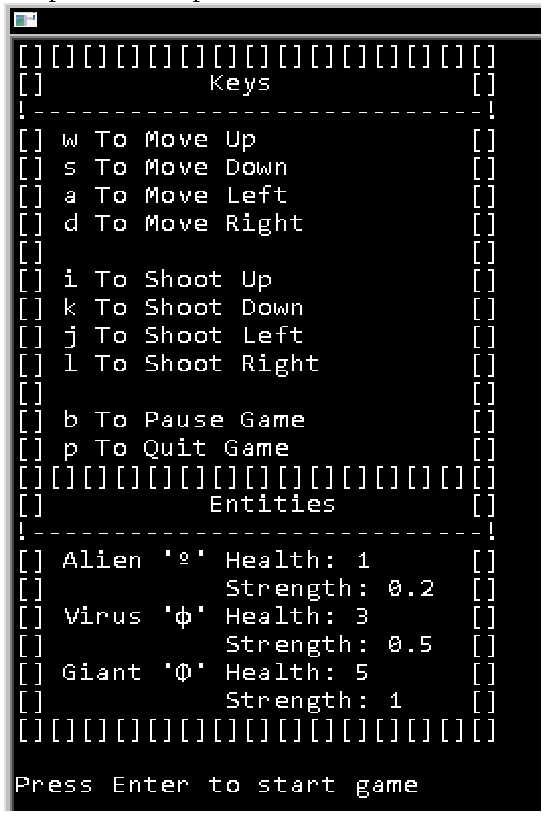
```
[][][][][][][][][]
[]    WELCOME!!   []
!----------------!
[] 1) New Game   []
[] 2) Load Game  []
[] 3) Help       []
[] 4) Exit       []
[][][][][][][][][]
2
Enter the code:
```

Input menu option 3



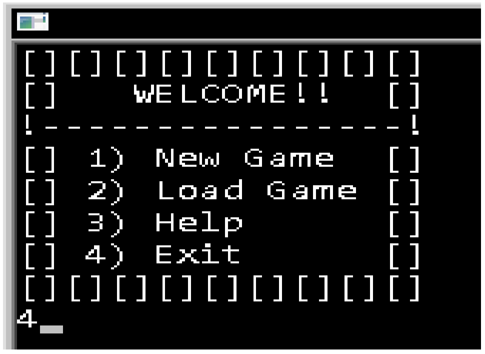
```
[][][][][][][][][]
[]    WELCOME!!   []
!----------------!
[] 1) New Game   []
[] 2) Load Game  []
[] 3) Help       []
[] 4) Exit       []
[][][][][][][][][]
3
```

Output menu option 3



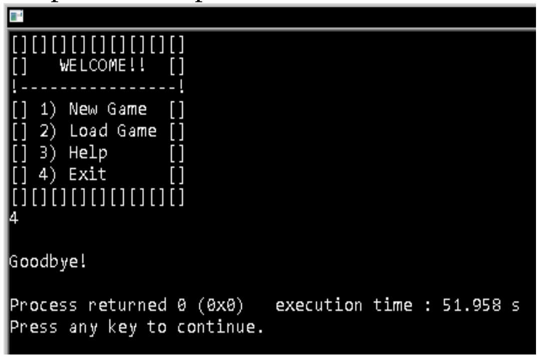
```
[][][][][][][][][][][][][][][]
[]            Keys            []
!----------------------------!
[] w To Move Up               []
[] s To Move Down             []
[] a To Move Left             []
[] d To Move Right            []
[]                            []
[] i To Shoot Up              []
[] k To Shoot Down            []
[] j To Shoot Left            []
[] l To Shoot Right           []
[]                            []
[] b To Pause Game            []
[] p To Quit Game             []
[][][][][][][][][][][][][][][]
[]          Entities          []
!----------------------------!
[] Alien 'º' Health: 1        []
[]           Strength: 0.2    []
[] Virus 'φ' Health: 3        []
[]           Strength: 0.5    []
[] Giant 'Φ' Health: 5        []
[]           Strength: 1      []
[][][][][][][][][][][][][][][]

Press Enter to start game
```

Input menu option 4



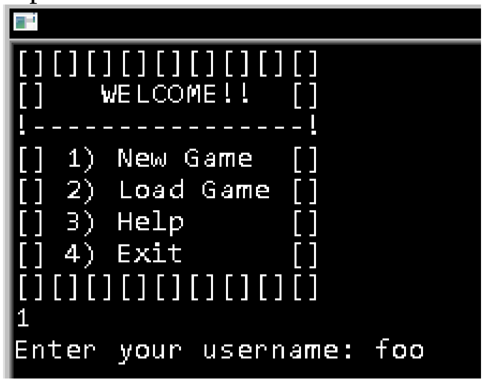
```
[][][][][][][][][]
[]    WELCOME!!   []
!----------------!
[] 1) New Game   []
[] 2) Load Game  []
[] 3) Help       []
[] 4) Exit       []
[][][][][][][][][]
4_
```

Output menu option 4



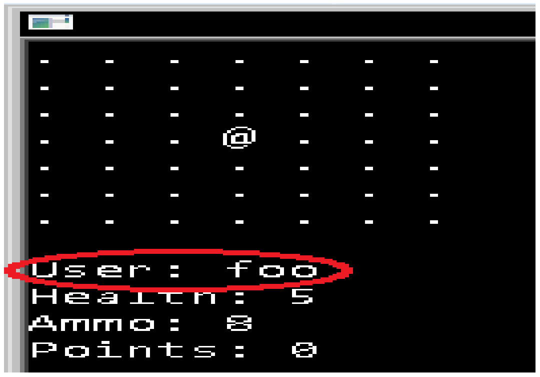
```
[][][][][][][][][]
[]   WELCOME!!  []
!---------------!
[] 1) New Game  []
[] 2) Load Game []
[] 3) Help      []
[] 4) Exit      []
[][][][][][][][][]
4

Goodbye!

Process returned 0 (0x0)   execution time : 51.958 s
Press any key to continue.
```

Input Username



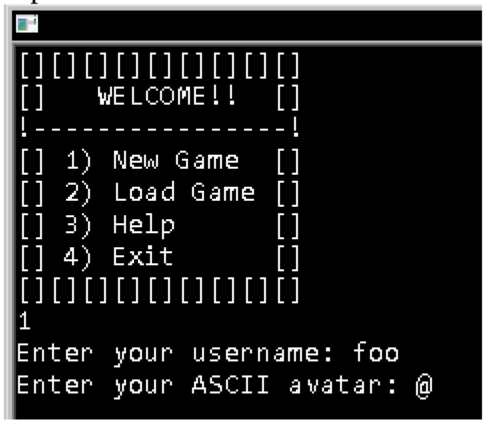
```
[][][][][][][][][]
[]   WELCOME!!   []
!----------------!
[] 1) New Game   []
[] 2) Load Game  []
[] 3) Help       []
[] 4) Exit       []
[][][][][][][][][]
1
Enter your username: foo
```

Output Username



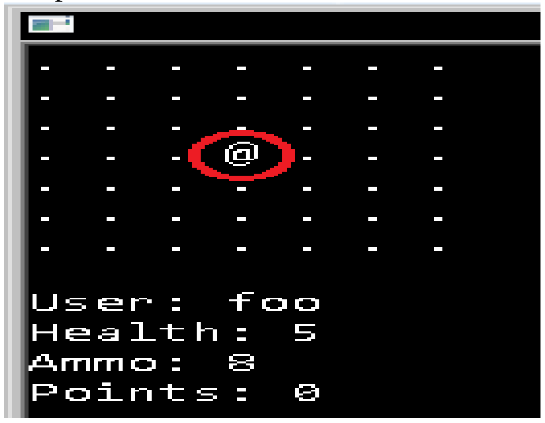
```
-    -    -    -    -    -    -
-    -    -    -    -    -    -
-    -    -    -    -    -    -
-    -    -    @    -    -    -
-    -    -    -    -    -    -
-    -    -    -    -    -    -
-    -    -    -    -    -    -

User: foo
Health: 5
Ammo: 8
Points: 0
```

Input Avatar



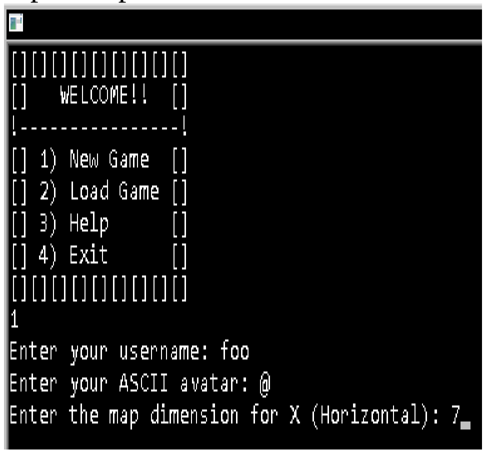
```
[][][][][][][][][]
[]   WELCOME!!  []
!---------------!
[] 1) New Game  []
[] 2) Load Game []
[] 3) Help      []
[] 4) Exit      []
[][][][][][][][][]
1
Enter your username: foo
Enter your ASCII avatar: @
```

Output Avatar



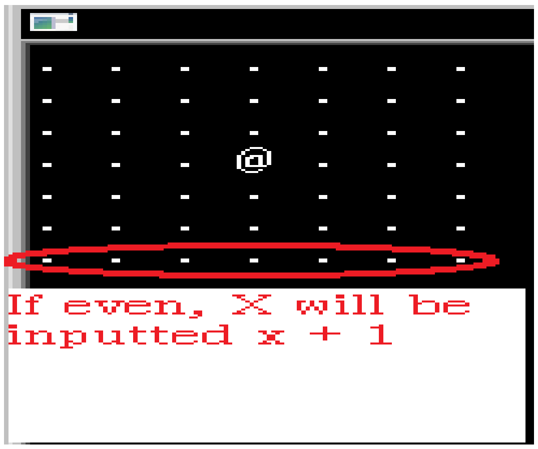
```
-    -    -    -    -    -    -
-    -    -    -    -    -    -
-    -    -    -    -    -    -
-    -    -    @    -    -    -
-    -    -    -    -    -    -
-    -    -    -    -    -    -
-    -    -    -    -    -    -

User: foo
Health: 5
Ammo: 8
Points: 0
```

Input map dimension for X



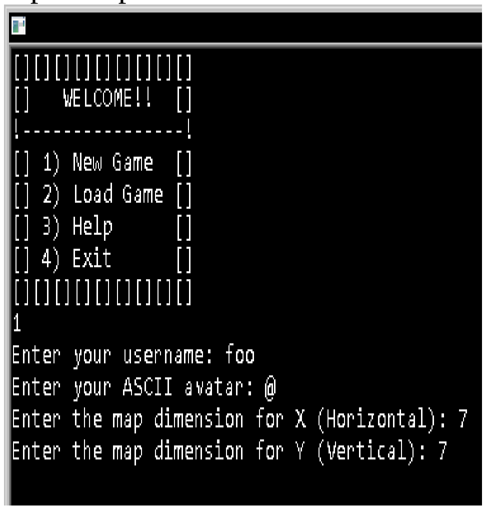
```
[][][][][][][][][]
[]   WELCOME!!  []
|---------------|
[] 1) New Game  []
[] 2) Load Game []
[] 3) Help      []
[] 4) Exit      []
[][][][][][][][][]
1
Enter your username: foo
Enter your ASCII avatar: @
Enter the map dimension for X (Horizontal): 7
```

Output map dimension for X



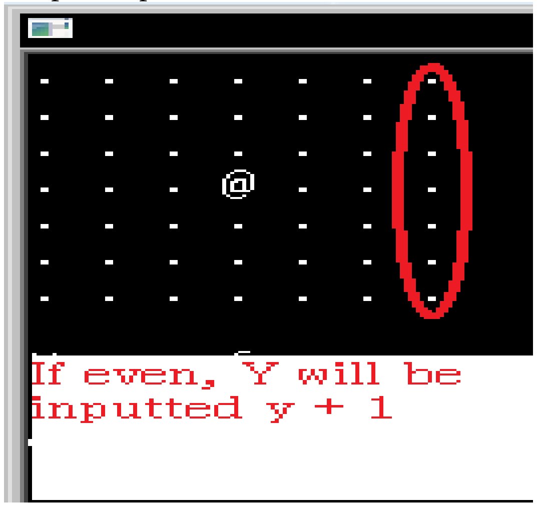
```
-  -  -  -  -  -  -
-  -  -  -  -  -  -
-  -  -  -  -  -  -
-  -  -  @  -  -  -
-  -  -  -  -  -  -
-  -  -  -  -  -  -
-  -  -  -  -  -  -
```

Input map dimension for Y



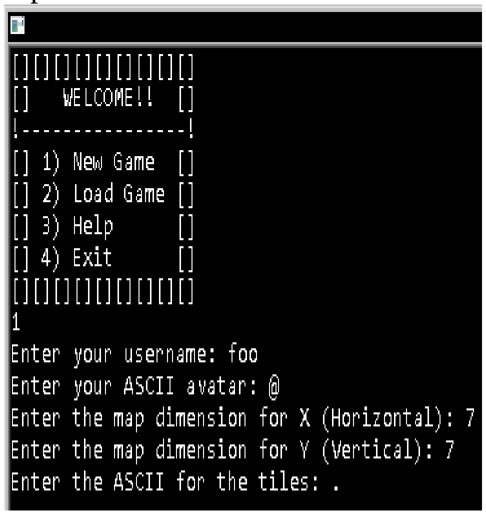
```
[][][][][][][][][]
[]   WELCOME!!  []
|---------------|
[] 1) New Game  []
[] 2) Load Game []
[] 3) Help      []
[] 4) Exit      []
[][][][][][][][][]
1
Enter your username: foo
Enter your ASCII avatar: @
Enter the map dimension for X (Horizontal): 7
Enter the map dimension for Y (Vertical): 7
```

Output map dimension for Y



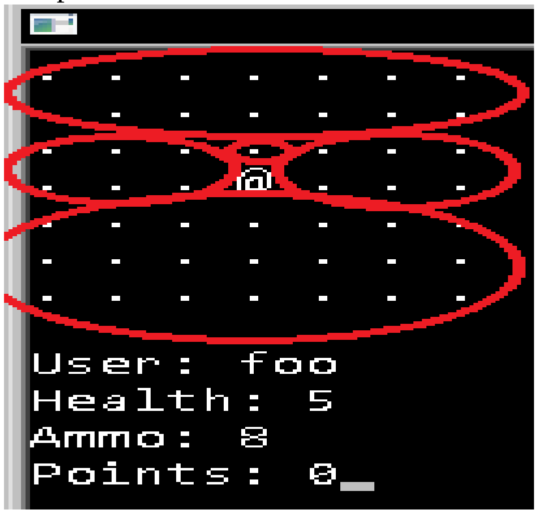
```
-  -  -  -  -  -  -
-  -  -  -  -  -  -
-  -  -  -  -  -  -
-  -  -  @  -  -  -
-  -  -  -  -  -  -
-  -  -  -  -  -  -
-  -  -  -  -  -  -
```

Input ASCII for tiles



```
[][][][][][][][][]
[]   WELCOME!!  []
|---------------|
[] 1) New Game  []
[] 2) Load Game []
[] 3) Help      []
[] 4) Exit      []
[][][][][][][][][]
1
Enter your username: foo
Enter your ASCII avatar: @
Enter the map dimension for X (Horizontal): 7
Enter the map dimension for Y (Vertical): 7
Enter the ASCII for the tiles: .
```

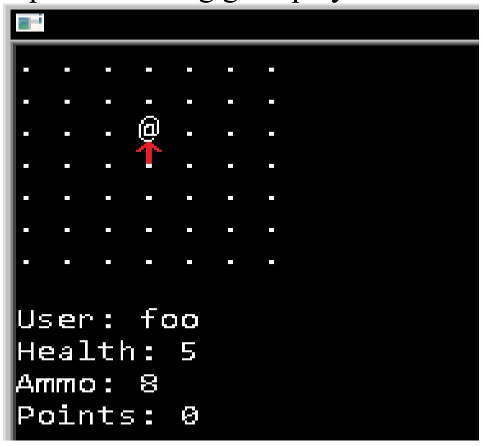
Output ASCII for tiles



```
-  -  -  -  -  -  -
-  -  -  -  -  -  -
-  -  -  -  -  -  -
-  -  -  @  -  -  -
-  -  -  -  -  -  -
-  -  -  -  -  -  -
-  -  -  -  -  -  -

User: foo
Health: 5
Ammo: 8
Points: 0
```

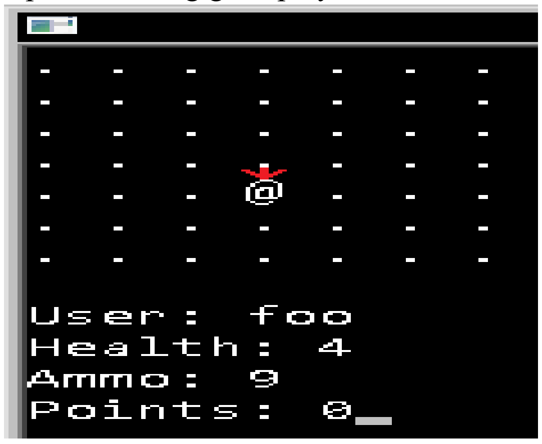
Note: These screenshots may vary since things are generated at random.

Input ‘w’ during gameplay



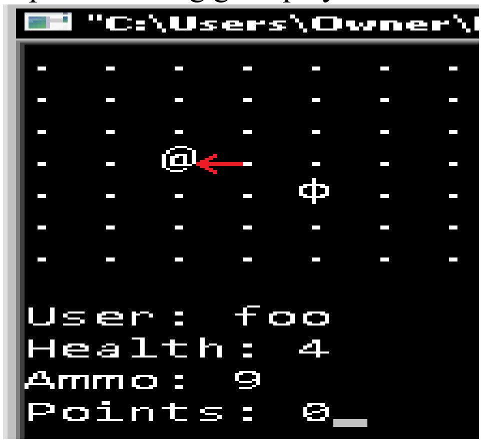
```
.  .  .  .  .  .  .
.  .  .  .  .  .  .
.  .  .  @  .  .  .
.  .  .  .  .  .  .
.  .  .  .  .  .  .
.  .  .  .  .  .  .
.  .  .  .  .  .  .

User: foo
Health: 5
Ammo: 8
Points: 0
```

Input ‘s’ during gameplay



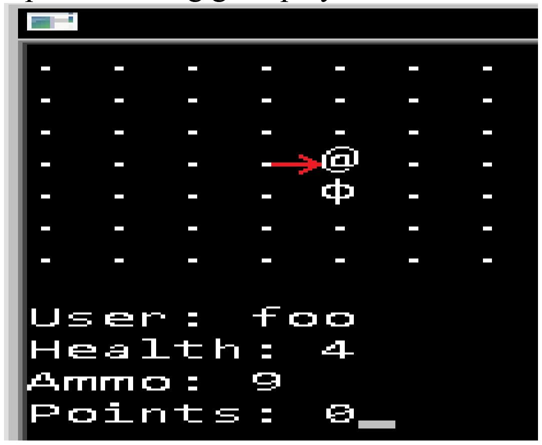
```
-  -  -  -  -  -  -
-  -  -  -  -  -  -
-  -  -  -  -  -  -
-  -  -  -  -  -  -
-  -  -  @  -  -  -
-  -  -  -  -  -  -
-  -  -  -  -  -  -

User: foo
Health: 4
Ammo: 9
Points: 0_
```

Input ‘a’ during gameplay



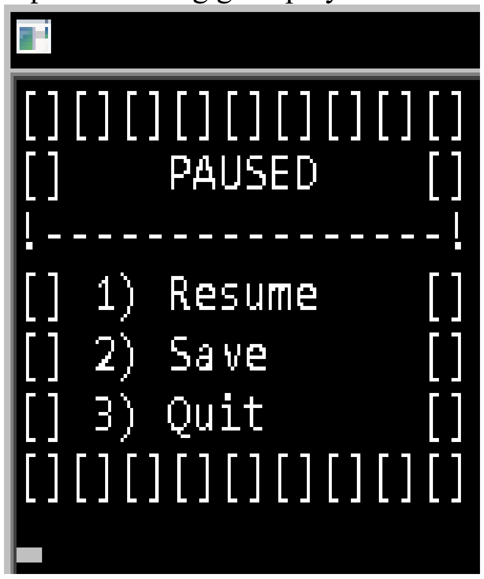
```
"C:\Users\Owner\
-  -  -  -  -  -  -
-  -  -  -  -  -  -
-  -  -  -  -  -  -
-  -  @  -  -  -  -
-  -  -  -  Φ  -  -
-  -  -  -  -  -  -
-  -  -  -  -  -  -

User: foo
Health: 4
Ammo: 9
Points: 0_
```

Input ‘d’ during gameplay



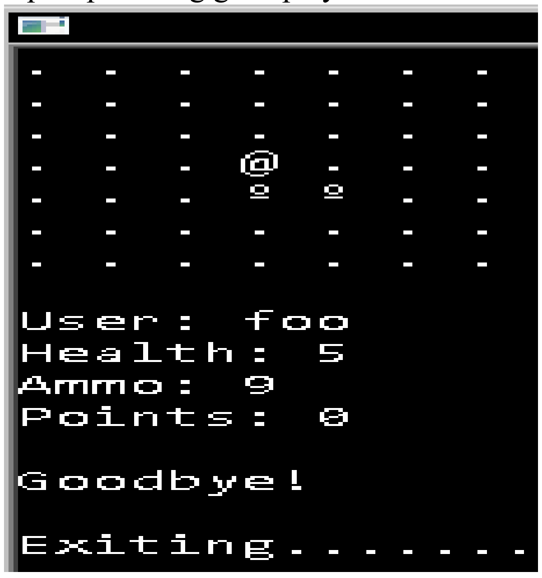
```
-  -  -  -  -  -  -
-  -  -  -  -  -  -
-  -  -  -  -  -  -
-  -  -  -  @  -  -
-  -  -  -  Φ  -  -
-  -  -  -  -  -  -
-  -  -  -  -  -  -

User: foo
Health: 4
Ammo: 9
Points: 0_
```

Input ‘b’ during gameplay



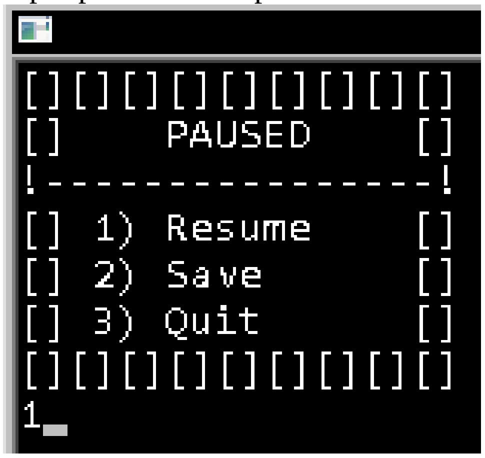
```
[][][][][][][][][]
[]    PAUSED    []
!----------------!
[] 1) Resume    []
[] 2) Save      []
[] 3) Quit      []
[][][][][][][][][]

_
```

Input ‘p’ during gameplay



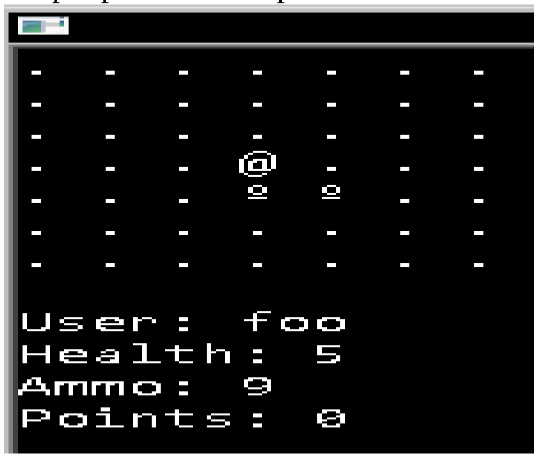
```
-  -  -  -  -  -  -
-  -  -  -  -  -  -
-  -  -  -  -  -  -
-  -  -  @  -  -  -
-  -  -  ♀  ♀  -  -
-  -  -  -  -  -  -
-  -  -  -  -  -  -

User: foo
Health: 5
Ammo: 9
Points: 0

Goodbye!

Exiting........
```

Input pause menu option 1



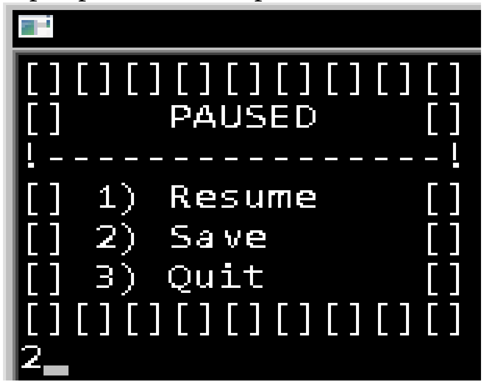
```
[][][][][][][][][]
[]    PAUSED    []
!----------------!
[] 1) Resume    []
[] 2) Save      []
[] 3) Quit      []
[][][][][][][][][]
1_
```

Output pause menu option 1



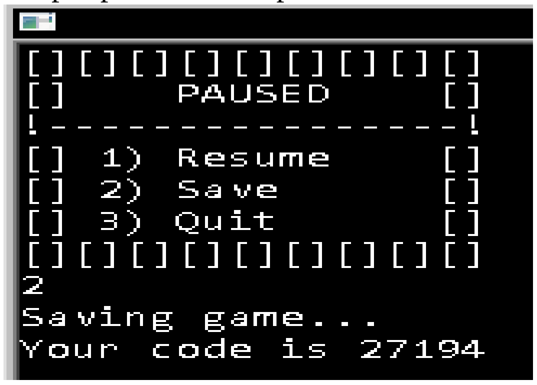
```
-   -   -   -   -   -   -
-   -   -   -   -   -   -
-   -   -   -   -   -   -
-   -   -   @   -   -   -
-   -   -   º   º   -   -
-   -   -   -   -   -   -
-   -   -   -   -   -   -

User: foo
Health: 5
Ammo: 9
Points: 0
```

Input pause menu option 2



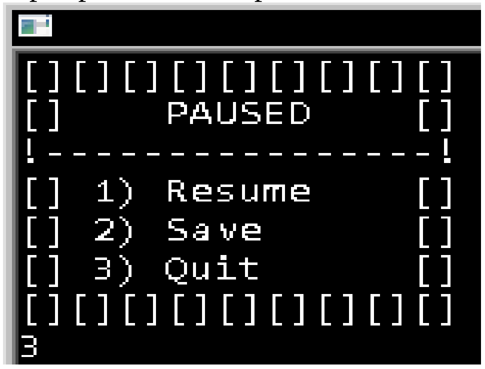
```
[][][][][][][][][]
[]    PAUSED    []
!----------------!
[] 1) Resume    []
[] 2) Save      []
[] 3) Quit      []
[][][][][][][][][]
2_
```

Output pause menu option 2



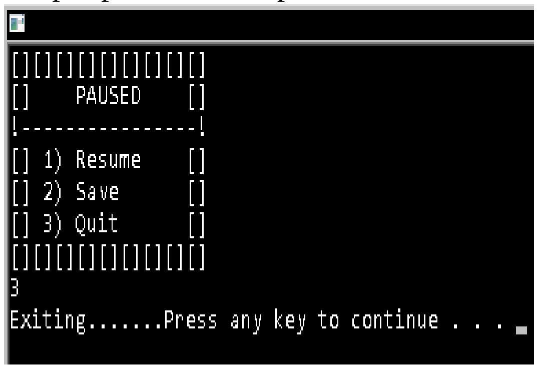
```
[][][][][][][][][]
[]    PAUSED    []
!----------------!
[] 1) Resume    []
[] 2) Save      []
[] 3) Quit      []
[][][][][][][][][]
2
Saving game...
Your code is 27194
```

Input pause menu option 3



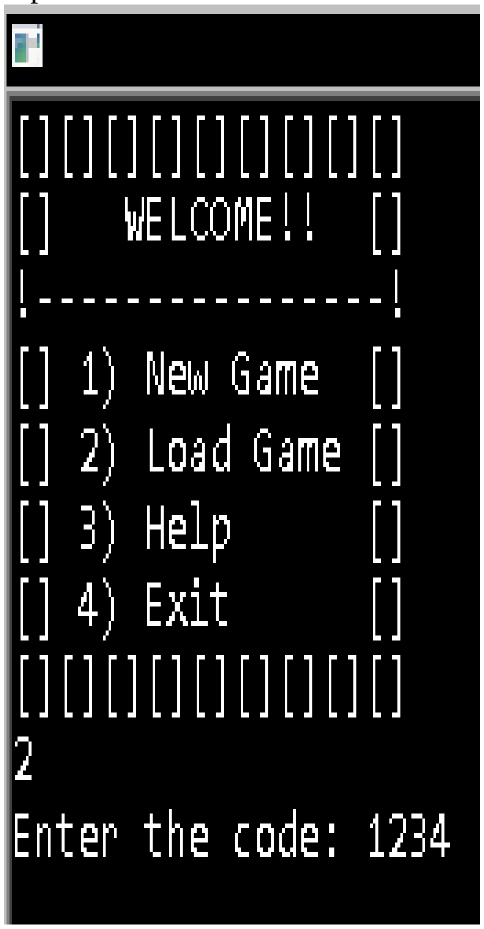
```
[][][][][][][][][]
[]    PAUSED    []
!----------------!
[] 1) Resume    []
[] 2) Save      []
[] 3) Quit      []
[][][][][][][][][]
3
```

Output pause menu option 3



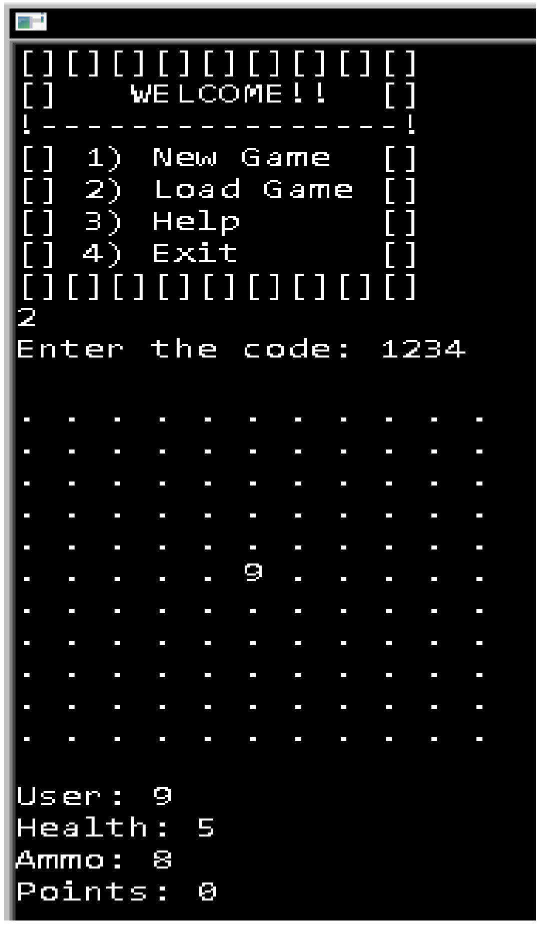
```
[][][][][][][][][]
[]    PAUSED    []
!----------------!
[] 1) Resume    []
[] 2) Save      []
[] 3) Quit      []
[][][][][][][][][]
3
Exiting.......Press any key to continue . . .
```

Input load code



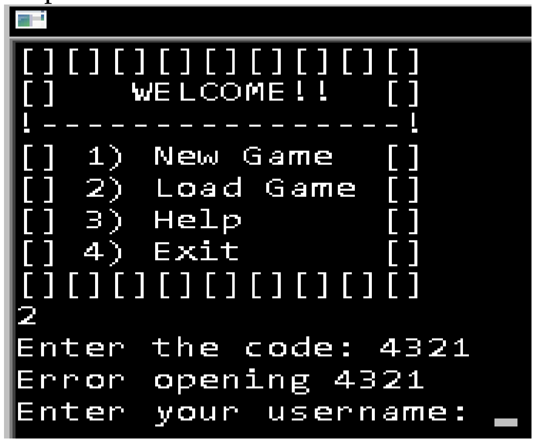
```
[][][][][][][][][]
[]   WELCOME!!   []
!----------------!
[] 1) New Game   []
[] 2) Load Game  []
[] 3) Help       []
[] 4) Exit       []
[][][][][][][][][]
2
Enter the code: 1234
```

Output if load code was correct (VARIES)



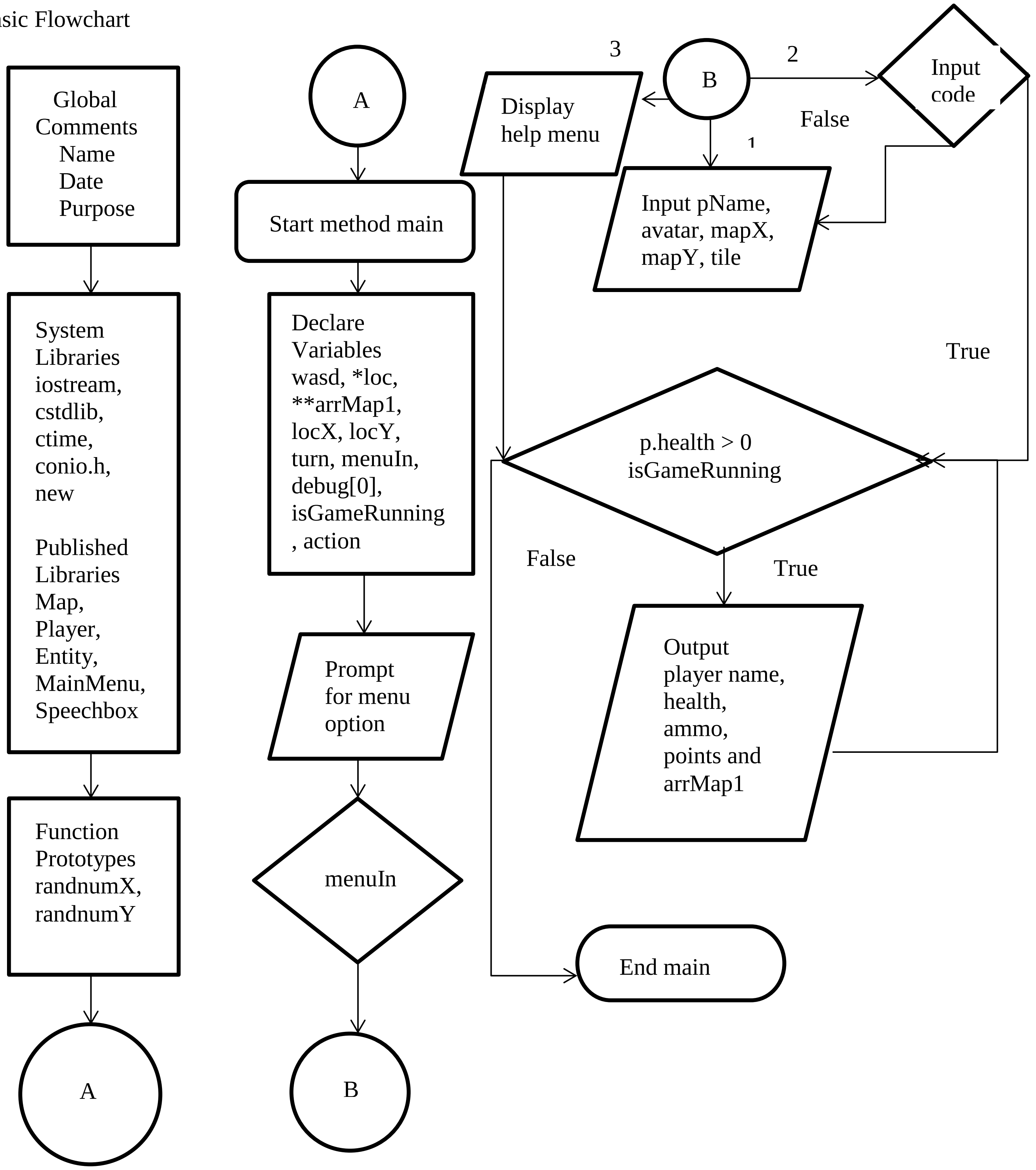
```
[][][][][][][][][]
[]   WELCOME!!   []
!----------------!
[] 1) New Game   []
[] 2) Load Game  []
[] 3) Help       []
[] 4) Exit       []
[][][][][][][][][]
2
Enter the code: 1234

. . . . . . . . . . .
. . . . . . . . . . .
. . . . . . . . . . .
. . . . . . . . . . .
. . . . . . . . . . .
. . . . . 9 . . . . .
. . . . . . . . . . .
. . . . . . . . . . .
. . . . . . . . . . .
. . . . . . . . . . .
. . . . . . . . . . .

User: 9
Health: 5
Ammo: 8
Points: 0
```

Output if load code incorrect



```
[][][][][][][][][]
[]   WELCOME!!   []
!----------------!
[] 1) New Game   []
[] 2) Load Game  []
[] 3) Help       []
[] 4) Exit       []
[][][][][][][][][]
2
Enter the code: 4321
Error opening 4321
Enter your username: _
```

Basic Flowchart


Global Comments Name Date Purpose
System Libraries iostream, cstdlib, ctime, conio.h, new
Published Libraries Map, Player, Entity, MainMenu, Speechbox
Function Prototypes randnumX, randnumY
A
A
Start method main
Declare Variables wasd, *loc, **arrMap1, locX, locY, turn, menuIn, debug[0], isGameRunning , action
Prompt for menu option
menuIn
B
B
3
2
1
Display help menu
Input code
False
Input pName, avatar, mapX, mapY, tile
True
p.health > 0 isGameRunning
False
True
Output player name, health, ammo, points and arrMap1
End main

Pseudo Code

```
Prompt for menu option
If menu option == 1
    If getIsCodeGood == false
        Prompt for player name, avatar, map x, map y
        Try to allocate memory, catch insufficient memory
        Fill the map for y = 0; y < map y; y++
            Fill the map for x = 0; x < map x; x++
        While game is running
            Place entities and pickups on map
            Wait for player input
            If input == p
                Exit program
            If input == b
                Display menu
                Prompt for menu option
                If option == 1
                    Resume game loop
                If option == 2
                    Save game
                If option == 3
                    Exit program
            If input == w
                Move up
               Check for collision
               If collision == entity
                   Remove health
               If collision == health
                   Add health
               If collision == bullet
                   Add ammo
            If input == s
                Move down
               Check for collision
               If collision == entity
                   Remove health
               If collision == health
                   Add health
               If collision == bullet
                   Add ammo
            If input == a
                Move left
               Check for collision
               If collision == entity
                   Remove health
```

```
   If collision == health
       Add health
   If collision == bullet
       Add ammo
If input == d
    Move left
   Check for collision
   If collision == entity
       Remove health
   If collision == health
       Add health
   If collision == bullet
       Add ammo
If input == i
    If ammo == 0
        Output no more ammo
    Else if ammo > 0
        Remove ammo
        Check for entity
        If entity on top
            Remove entity health
            If entity dead
                Add points
If input == k
    If ammo == 0
        Output no more ammo
    Else if ammo > 0
        Remove ammo
        Check for entity
        If entity on bottom
            Remove entity health
            If entity dead
                Add points
If input == j
    If ammo == 0
        Output no more ammo
    Else if ammo > 0
        Remove ammo
        Check for entity
        If entity on left
            Remove entity health
            If entity dead
                Add points
If input == l
    If ammo == 0
        Output no more ammo
        Else if ammo > 0
            Remove ammo
            Check for entity
            If entity on right
                Remove entity health
                If entity dead
                    Add points
If menu option == 2
    Prompt for load code
    If code is good
        Set map and player properties according to save file
        Start game loop
If menu option == 3
    Display help menu
    Start game loop
If menu option == 4
    Exit program
```

Major Variables

Type	**Name**	**Description**	**File**	**Line(s)**
char	wasd	Holds player in game input	main.cpp	34, 168, 180, 192, 215, 258, 301, 344, 390, 476, 562, 648
	*loc	Holds plyer's location	main.cpp	35, 177, 249, 292, 335, 378
	**arrMap1	Game map	main.cpp	36, 91, 105, 128, 747, 752, 764, 766
	avatar	Avatar of entities	Entity.hpp	48, 53, 66, 83, 88, 101, 118, 123, 136
		Avatar of player	Player.hpp	27, 35, 69
			Player.cpp	50, 54
	tile	Stores the map tile	Map.hpp	23, 34, 40, 48
			Map.cpp	54, 74
int	locX	Holds entity's location on 'x'	Entitiy.hpp	16, 25, 30, 35, 53, 58, 68, 88, 93, 103, 123, 128, 138
		Holds player's location on 'x'	main.cpp	37, 116, 139, 115, 157, 159, 162, 164, 177, 248, 249, 291, 292, 304, 334, 335, 347

		Holds player’s location on ‘x’	Player.hpp	22, 42, 57
	locY	Holds entity’s location on ‘y’	Entity.hpp	17, 25, 30, 37, 53, 60, 70, 88, 95, 105, 123, 130, 140
		Holds player’s location on ‘y’	main.cpp	38, 117, 140, 155, 177, 218, 248, 249, 291, 292, 294, 337
		Holds player’s location on ‘y’	Player.hpp	23, 44, 59
	turn	Calculates turn taken	main.cpp	39, 157, 159, 162, 164, 170, 171
	menuIn	Holds menu options	main.cpp	40, 60, 63, 72, 75, 76, 200, 202, 205, 206, 208
	isGameRunning	Checks if game is running or not	main.cpp	42, 183, 757
	action	Checks if player is attacking or not	main.cpp	43, 152, 182, 220, 263, 306, 349, 392, 478, 564, 650
	points	Stores an entity’s point worth	Entity.hpp	19, 27, 54, 74, 89, 109, 124, 44
	strength	Stores an entity’s point worth	Entity.hpp	20, 26, 31, 41, 54, 76, 89, 111, 124, 146
	mapX	Stores location on ‘x’	Map.hpp	21, 34, 44
			Map.cpp	25, 46, 59
	mapY	Stores location on ‘y’	Map.hpp	22, 34, 46
			Map.cpp	37, 50, 60
	ammo	Stores player ammo amount	Player.hpp	24, 36, 61
			Player.cpp	37, 38
	pts	Stores total player points	Player.hpp	25, 37, 53, 63
	health	Stores entity health amount	Entity.hpp	18, 26, 31, 39, 54, 62, 72, 89, 97, 107, 124, 132, 142
		Stores player health amount	Player.hpp	26, 35, 50, 65
bool	isOpenSuccess	Checks if file opened successfully	FileStream.hpp	17, 21, 25
vector	rndm	Stores random numbers	Random.hpp	24, 40, 48, 56

Concepts, syntax, keywords… (chapters 9 - 16)

Type	**File**	**Line**
Pointer ‘*’	FileStream.hpp	29, 30
	FileStream.cpp	22, 74, 102
	main.cpp	25, 26, 35, 36, 51, 52 , 53, 91, 778, 786, 789, 796, 802, 805
	MainMenu.hpp	29
Pointer ‘&’	main.cpp	142, 143, 145, 146, 148, 149, 155, 157, 159, 162, 164, 177, 249, 292, 335, 378, 752
	Map.cpp	42
	Map.hpp	51
	Player.cpp	42, 60
	Player.hpp	76, 77
Dynamic Memory Allocation	main.cpp	51, 52, 53, 91 - 93
‘delete’	main.cpp	764, 766 - 769
‘string’	Player.hpp	30, 47, 72
Aggregation ‘.’	main.cpp	66, 75, 76, 79, 91 – 93, 102, 104, 105, 109, 112, 113, 116, 117, 126, 128, 139 – 149, 155 – 164, 174, 187, 198, 205, 206, 208, 222, 223, 225, 226, 228, 235, 240, 242, 248, 251, 261, 264, 265, 268, 269, 271, 276, 278, 283, 285, 291, 294, 308, 309, 311, 312, 314, 319, 321, 326, 328, 334, 337, 347, 351, 352, 354, 355, 357, 362, 364, 369, 371, 377, 380, 395, 397, 400, 404, 407, 409, 413, 416, 419, 422, 425, 427, 429, 432, 437, 440, 443…
	Map.cpp	46, 50, 54, 59, 60, 74
	Player.cpp	46, 50, 53, 54, 63 - 66
‘::’	FileStream.cpp	22
	Map.cpp	20, 30, 63, 68
	Player.cpp	20, 34, 37, 45, 53
Arrow pointer ‘->’	main.cpp	223, 225, 230, 237, 244, 266, 268, 273, 280, 287, 309, 311, 316, 323, 330, 352, 354, 359, 366, 373, 407, 425, 450, 493, 511, 536, 579, 597, 622, 665, 683, 708
	Player.cpp	28, 29
‘this’	Player.cpp	28, 29
Enumerated data type	Speechbox.hpp	24
Opening file for I/O	FileStream.cpp	34, 66, 86, 105, 114
File output (read from)	FileStream.cpp	37 – 48, 66 - 69
	main.cpp	58, 66, 198
	MainMenu.hpp	82

File input (write to)	FileStream.cpp	80 – 91, 105 – 107, 114 - 116
	main.cpp	187
	MainMenu.hpp	104
Binary files	FileStream.cpp	66 – 69, 105 – 107, 114 - 116
	MainMenu.cpp	82, 104
‘class’	Entity.hpp	13, 45, 80, 115,
	FileStream.hpp	14
	MainMenu.hpp	25
	Map.hpp	18
	Menu.hpp	21
	Player.hpp	19
	Random.hpp	21
	Speechbox.hpp	21, 39, 54,
Constructor	Entity.hpp	24,
	MainMenu.hpp	37
	Map.hpp	33
	Menu.hpp	28
	Player.hpp	34
Destructor	N/A	N/A
Overloaded constructor	Entity.hpp	29, 52, 87, 122
	MainMenu.hpp	40
‘private’		
‘public’	Entity.hpp	21, 49, 84, 119
	FileStream.hpp	18
	MainMenu.hpp	34
	Map.hpp	24
	Menu.hpp	26
	Player.hpp	31
	Random.hpp	25
	Speechbox.hpp	25, 41, 56,
Instance variables	main.cpp	46 – 48, 51 - 53
‘friend’	Map.hpp	51
	Player.hpp	76, 77
Overload operators	Map.hpp	51
	Map.cpp	42 - 78
	main.cpp	82, 85, 133, 755
	Player.hpp	76, 77
	Player.cpp	42 – 57, 60 - 68
Base class	Entity.hpp	9 - 42
	FileStream.hpp	(Whole file)
	Map.hpp	(Whole file)
	Speechbox.hpp	21 - 36
Inheritance (class)	Entity.hpp	45 – 77, 80 – 112, 115 - 147
	MainMenu.hpp	(Whole file)
	Menu.hpp	(Whole file)

	Player.hpp	(Whole file)
	Speechbox.hpp	54 - 64
Multiple Inheritance	Speechbox.hpp	39 - 51
‘protected’	Entity.hpp	15, 47, 82, 117
	FleStream.hpp	16
	Map.hpp	20
	Menu.hpp	23
Abstract class	Speechbox.hpp	21 – 36, 39 - 51
‘virtual’	Speechbox.hpp	28, 43
Polymorphism	main.cpp	230, 237, 244, 273, 280, 287, 316, 323, 330, 359, 366, 373, 407, 425, 450, 493, 511, 536, 579, 597, 622, 665, 683, 708
Function Templates	Random.hpp	37 – 41, 44 – 49, 52 - 57
Class Templates	Random.hpp	21 – 33
Exceptions	Map.hpp	26, 28
	Map.cpp	57 – 72,
	main.cpp	89 - 99
STL	main.cpp	15, 96
	Random.hpp	14, 24, 48, 56

References

I mostly used the book for syntax and example code and used the cplusplus.com for understanding and correctly implementing keywords. If I got an error I would search the cplusplus forum and it usually turned out to be syntax errors. Finally, I used similar methods of RPG game format from game libraries in other languages I program in.

Main program

```
/*
 * File:    main.cpp
 * Author:  Najera Enrique
 * Purpose: CSC-17-A Project 2
 *          Some random RPG
 *
 * 08 December 2014
 */

//System Libraries
#include <iostream>
#include <cstdlib> // rand, srand
#include <ctime>   // time
#include <conio.h> // _getch()
#include <new>     // Catch memory errors

//Published Libraries
#include "Map.hpp"
```

```
#include "Player.hpp"
#include "Entity.hpp"
#include "MainMenu.hpp"
#include "Speechbox.hpp"

//Function Prototypes
int randnumX(int *, int *);
int randnumY(int *, int *);

//Namespaces
using namespace std;

int main()
{
   //Declare Variables
   char wasd  = ' ';          // Holds player's movement
   char *loc  = 0;            // Holds player location
   char **arrMap1;            // For allocating memory
   int locX   = 0;            // Holds X location
   int locY   = 0;            // Holds Y location
   int turn   = 0;            // Holds turns taken
   int menuIn = 0;            // Holds menu input
   int debug[0];              // Converts char to int for debug file
   bool isGameRunning = true; // Checks if game is still running
   bool action = false;       // Checks if player is fighting

   //Define objects
   Player p;
   Map map1;
   MainMenu menu;

   //Allocate instances
   Speechbox *sB = new Playerbox();
   Playerbox *pB = new Playerbox();
   Pickupbox *pU = new Pickupbox();

   //Build FileStream object
   FileStream f;
   //Display menu and prompt for choice
   f.readFile("Main.mnu", 0, 0);

   cin >> menuIn;

   //If 3, display help screen
   if(menuIn == 3)
   {
       system("cls");
       f.readFile("help.mnu", 0, 0);
       cout << "\nPress Enter to start game\n";
       _getch();
       system("cls");
   }
   //If 4, exit and don,t bother set or output
   else if(menuIn == 4){ cout << "\nGoodbye!\n"; exit(EXIT_SUCCESS); }

   //If not 3, set and output menu
   menu.setInN(menuIn);
   menu.outMenu(menuIn);

   //If load game fail, prompt
   if(menu.getIsCodeGood() == false)
   {
       //Prompt for user info
       cin >> p;

       //Prompt for map properties
       cin >> map1;
   }

   //Allocate memory for map
   try
   {
       arrMap1 = new char*[map1.getMapY()];
       for (int i = 0; i < map1.getMapY(); ++i)
           arrMap1[i] = new char[map1.getMapX()];
   }
   //Catch error
   catch (bad_alloc)
   {
       cout << "Insufficient memory!\n";
   }

   //Fill the map with tiles
   for(int y = 0; y < map1.getMapY(); y++)
   {
       for(int x = 0; x < map1.getMapX(); x++)
           arrMap1[y][x] = map1.getTile();
   }

   //Place player in center of map
   arrMap1[map1.getMapY() / 2][map1.getMapX() / 2] = p.getAvatar();
```

```
    //Get player's location for logging
    p.setLocX(map1.getMapX());
    p.setLocY(map1.getMapY());

    //Get player's location for movement
    locX = p.getLocX() / 2;
    locY = p.getLocY() / 2;

    //Build entities
    //location x, location y, health, strength
    Alien alien(0, 0, 1, -0.2f);
    Virus virus(0, 0, 3, -0.5f);
    Giant giant(0, 0, 5, -1.0f);

    //Output map
    for (int y = 0; y < map1.getMapY(); y++)
    {
        for (int x = 0; x < map1.getMapX(); x++)cout << arrMap1[y][x]<<" ";
        cout<<endl;
    }

    //Display user info
    cout << p;

    //Game loop starts here
    do{
        //Update locations
        //Player
        p.setLocX(locX);
        p.setLocY(locY);
        //Alien
        alien.setLocY_Alien(randnumY(&locY, &locX));
        alien.setLocX_Alien(randnumX(&locY, &locX));
        //Virus
        virus.setLocY_Virus(randnumY(&locY, &locX));
        virus.setLocX_Virus(randnumY(&locY, &locX));
        //Giant
        giant.setLocY_Giant(randnumY(&locY, &locX));
        giant.setLocX_Giant(randnumY(&locY, &locX));

        //Place objects on map if not action
        if(action == false)
        {
            //Entities
            arrMap1[randnumY(&locY, &locX)][randnumX(&locY, &locX)] =
alien.getAvatar_Alien();
```

```
            //Every 2 turns add a virus
            if(turn % 2 == 0)arrMap1[randnumY(&locY, &locX)][randnumX(&locY, &locX)] =
virus.getAvatar_Virus();
            //Every 4 turns add a giant
            if(turn % 4 == 0)arrMap1[randnumY(&locY, &locX)][randnumX(&locY, &locX)] =
giant.getAvatar_Giant();
            //Pickups
            //Every 5 turns add a bullet
            if(turn % 5 == 0)arrMap1[randnumY(&locY, &locX)][randnumX(&locY, &locX)] =
p.getBullet();
            //every 10 turns add health
            if(turn % 10 == 0)arrMap1[randnumY(&locY, &locX)][randnumX(&locY, &locX)] =
'+';
        }//End placing objects

        //Get player movement
        wasd = _getch();

        //Increment turn
        turn++;

        //For keylogging
        p.setMovement(wasd);

        //Keep track of player location
        loc = &arrMap1[locY][locX];

        //If player quits, break from game loop
        if (wasd == 'p')
        {
            action = false;        // No action raking place
            isGameRunning = false; // Game will close
            debug[0] = 112;           // Debug value is quit
            cout << "\n\nGoodbye!\n" << endl;
            //Write to file for debugging purposes
            f.writeFile("debug.info", debug, 0);
            break;
        }//End player quits

        //Pause game
        else if(wasd == 'b')
        {
            //INTIT var menuIn
            menuIn = 0;
            system("cls");
            //Read pause menu file
```

```
    f.readFile("Pause.mnu", 0, 0);
    //Prompt for decision
    cin >> menuIn;
    //If 3, exit and clean
    if(menuIn == 3)break;

    //If not 3, set and output menu
    menu.setInN(menuIn);
    menu.outPMenu(menuIn);
    //If game saved, output load game code
    if(menuIn == 2)cout << "Your code is " << menu.getPassword() << endl;
    _getch();
}//End pause game

/* PLAYER MOVEMENT */

//Move up
else if (wasd == 'w')
{
    //If inside boundary
    if(locY > 0)
    {
        action = false;
        //Detect if player touched something
        if(arrMap1[locY][locX] == p.getBullet())              // Bullet     add  bullet
        { p.setAmmo(1); pU->picksup(0); _getch(); }
        else if(arrMap1[locY][locX] == '+')                   // Health Box add  health
        { p.setHealth(1); pU->picksup(1); _getch(); }
        else if(arrMap1[locY][locX] == alien.getAvatar_Alien()) // Alien      take health
        {
            p.setHealth(alien.getStrength_Alien());
            //Output entity attacks
            sB->attacks(0);
            _getch();
        }
        else if(arrMap1[locY][locX] == virus.getAvatar_Virus()) // Virus      take health
        {
            p.setHealth(virus.getStrength_Virus());
            //Output entity attacks
            sB->attacks(1);
            _getch();
        }
        else if(arrMap1[locY][locX] == giant.getAvatar_Giant()) // Giant      take health
        {
            p.setHealth(giant.getStrength_Giant());
            //Output entity attacks
            sB->attacks(2);
            _getch();
        }

        arrMap1[locY][locX] = map1.getTile(); // Redraw tile for player
        loc = &arrMap1[locY--][locX];         // Get new location

        arrMap1[locY][locX] = p.getAvatar();  // Draw avatar on new location
        system("cls");                        // Clear the screen
    }
    else system("cls");
}//End move up

//Move down
else if (wasd == 's')
{
    //If inside boundary
    if(locY < ((map1.getMapY()) - 1))
    {
        action = false;
        //Detect if player touched something
        if(arrMap1[locY][locX] == p.getBullet())            // Bullet     add bullet
        { p.setAmmo(1); pU->picksup(0); _getch(); }
        else if(arrMap1[locY][locX] == '+')                 // Health Box add health
        { p.setHealth(1); pU->picksup(1); _getch(); }
        else if(arrMap1[locY][locX] == alien.getAvatar_Alien()) // Alien      take health
        {
            p.setHealth(alien.getStrength_Alien());
            //Output entity attacks
            sB->attacks(0);
            _getch();
        }
        else if(arrMap1[locY][locX] == virus.getAvatar_Virus()) // Virus      take health
        {
            p.setHealth(virus.getStrength_Virus());
            //Output entity attacks
            sB->attacks(1);
            _getch();
        }
        else if(arrMap1[locY][locX] == giant.getAvatar_Giant()) // Giant      take health
        {
            p.setHealth(giant.getStrength_Giant());
            //Output entity attacks
            sB->attacks(2);
            _getch();
        }
        arrMap1[locY][locX] = map1.getTile(); // Redraw tile
        loc = &arrMap1[locY++][locX];         // Get new location

        arrMap1[locY][locX] = p.getAvatar();  // Draw avatar on new location
        system("cls");                        // Clear the screen
    }
    else system("cls");
}//End move down

//Move left
else if (wasd == 'a')
{
    //If inside boundary
    if(locX > 0)
    {
        action = false;
        //Detect if player touched something
        if(arrMap1[locY][locX] == p.getBullet())                // Bullet     add bullet
        { p.setAmmo(1); pU->picksup(0); _getch(); }
        else if(arrMap1[locY][locX] == '+')                     // Health Box add health
        { p.setHealth(1); pU->picksup(1); _getch(); }
        else if(arrMap1[locY][locX] == alien.getAvatar_Alien()) // Alien      take health
        {
            p.setHealth(alien.getStrength_Alien());
            //Output entity attacks
            sB->attacks(0);
            _getch();
        }
        else if(arrMap1[locY][locX] == virus.getAvatar_Virus()) // Virus      take health
        {
            p.setHealth(virus.getStrength_Virus());
            //Output entity attacks
            sB->attacks(1);
            _getch();
        }
        else if(arrMap1[locY][locX] == giant.getAvatar_Giant()) // Giant      take health
        {
            p.setHealth(giant.getStrength_Giant());
            //Output entity attacks
            sB->attacks(2);
            _getch();
        }

        arrMap1[locY][locX] = map1.getTile(); // Redraw tile
        loc = &arrMap1[locY][locX--];         // Get new location
        arrMap1[locY][locX] = p.getAvatar();  // Draw avatar on new location
        system("cls");                        // Clear the screen
    }
    else system("cls");
}//End move left

//Move right
else if (wasd == 'd')
{
    //If inside boundary
    if(locX < (map1.getMapX() - 1))
    {
        action = false;
        //Detect if player touched something
        if(arrMap1[locY][locX] == p.getBullet())                // Bullet     add bullet
        { p.setAmmo(1); pU->picksup(0); _getch(); }
        else if(arrMap1[locY][locX] == '+')                     // Health Box add health
        { p.setHealth(1); pU->picksup(1); _getch(); }
        else if(arrMap1[locY][locX] == alien.getAvatar_Alien()) // Alien      take health
        {
            p.setHealth(alien.getStrength_Alien());
            //Output entity attacks
            sB->attacks(0);
            _getch();
        }
        else if(arrMap1[locY][locX] == virus.getAvatar_Virus()) // Virus      take health
        {
            p.setHealth(virus.getStrength_Virus());
            //Output entity attacks
            sB->attacks(1);
            _getch();
        }
        else if(arrMap1[locY][locX] == giant.getAvatar_Giant()) // Giant      take health
        {
            p.setHealth(giant.getStrength_Giant());
            //Output entity attacks
            sB->attacks(2);
            _getch();
        }

        arrMap1[locY][locX] = map1.getTile(); // Redraw tile
        loc = &arrMap1[locY][locX++];         // Get new location

        arrMap1[locY][locX] = p.getAvatar();  // Draw avatar on new location
        system("cls");                        // Clear the screen
    }
    else system("cls");
}//End move right

/* PLAYER ACTIONS */

//Shooting
//shoot up
if(wasd == 'i')
{
    action = true;

    //Check if still has ammo
    if(p.getAmmo() <= 0)
        cout << "\nNo more ammo!\n";
    else if(p.getAmmo() > 0)
    {
        //Remove bullet
        p.setAmmo(-1);

        //Shoot entity if present
        //Alien
        if(arrMap1[locY - 1][locX] == alien.getAvatar_Alien())
        {
            //Tell player attacking alien
            pB->attacks(alien.getAvatar_Alien());
            //Take away 1 health point from alien
            alien.setHealth_Alien(-1);
            cout << "\nAlien killed!\n\n";

            //Give points
            p.setPts(alien.getPoints_Alien());

            //Remove alien from map
            arrMap1[locY - 1][locX] == map1.getTile();

            //Reset alien health for other aliens
            alien.setHealth_Alien(1);
        }//End murdering Alien
        //Virus
        else if(arrMap1[locY - 1][locX] == virus.getAvatar_Virus())
        {
            //Tell player attacking virus
            pB->attacks(virus.getAvatar_Virus());
            //Show and remove virus health
            cout << "\nVirus Health: " << virus.getHealth_Virus()
```

```
                << endl << endl;
            virus.setHealth_Virus(-1);

            //If virus killed
            if(virus.getHealth_Virus() == 0)
            {
                cout << "\nVirus Killed!\n\n";

                //Give points
                p.setPts(virus.getPoints_Virus());

                //Remove virus from map
                arrMap1[locY - 1][locX] == map1.getTile();

                //Reset virus health for other viruses
                virus.setHealth_Virus(3);
            }
        }//End murdering Virus
        //Giant
        else if(arrMap1[locY - 1][locX] == giant.getAvatar_Giant())
        {
            //Tell player attacking giant
            pB->attacks(giant.getAvatar_Giant());
            //Show and remove giant health
            cout << "\nGiant Health: " << giant.getHealth_Giant()
                << endl << endl;
            giant.setHealth_Giant(-1);

            //If giant killed
            if(giant.getHealth_Giant() == 0)
            {
                cout << "\nGiant Killed!\n\n";

                //Give points
                p.setPts(giant.getPoints_Giant());

                //Remove Giant from map
                arrMap1[locY - 1][locX] == map1.getTile();

                //Reset Giant health for other giants
                giant.setHealth_Giant(5);
            }
        }//End murdering Giant
        else cout << endl;
    }//End if p.getAmmo() > 0
}//End shoot up
```

```
//shoot down
else if(wasd == 'k')
{
   action = true;

   //Check if still has ammo
   if(p.getAmmo() <= 0)
      cout << "\nNo more ammo!\n";
   else if(p.getAmmo() > 0)
   {
      //Remove bullet
      p.setAmmo(-1);

      //Shoot entity if present
      //Alien
      if(arrMap1[locY + 1][locX] == alien.getAvatar_Alien())
      {
         //Tell player attacking alien
         pB->attacks(alien.getAvatar_Alien());
         //Take away 1 health point from alien
         alien.setHealth_Alien(-1);
         cout << "\nAlien killed!\n\n";

         //Give points
         p.setPts(alien.getPoints_Alien());

         //Remove alien from map
         arrMap1[locY + 1][locX] == map1.getTile();

         //Reset alien health for other aliens
         alien.setHealth_Alien(1);
      }//End murdering Alien
      //Virus
      else if(arrMap1[locY + 1][locX] == virus.getAvatar_Virus())
      {
         //Tell player attacking virus
         pB->attacks(virus.getAvatar_Virus());
         //Show and remove virus health
         cout << "\nVirus Health: " << virus.getHealth_Virus()
             << endl << endl;
         virus.setHealth_Virus(-1);

         //If virus killed
         if(virus.getHealth_Virus() == 0)
         {
            cout << "\nVirus Killed!\n\n";

            //Give points
            p.setPts(virus.getPoints_Virus());

            //Remove virus from map
            arrMap1[locY + 1][locX] == map1.getTile();

            //Reset virus health for other viruses
            virus.setHealth_Virus(3);
         }
      }//End murdering Virus
      //Giant
      else if(arrMap1[locY + 1][locX] == giant.getAvatar_Giant())
      {
         //Tell player attacking giant
         pB->attacks(giant.getAvatar_Giant());
         //Show and remove giant health
         cout << "\nGiant Health: " << giant.getHealth_Giant()
              << endl << endl;
         giant.setHealth_Giant(-1);

         //If giant killed
         if(giant.getHealth_Giant() == 0)
         {
            cout << "\nGiant Killed!\n\n";

            //Give points
            p.setPts(giant.getPoints_Giant());

            //Remove Giant from map
            arrMap1[locY + 1][locX] == map1.getTile();

            //Reset Giant health for other giants
            giant.setHealth_Giant(5);
         }
      }//End murdering Giant
      else cout << endl;
   }//End if p.getAmmo() > 0
}//End shoot down

//shoot left
else if(wasd == 'j')
{
   action = true;
```

```
//Check if still has ammo
if(p.getAmmo() <= 0)
    cout << "\nNo more ammo!\n";
else if(p.getAmmo() > 0)
{
    //Remove bullet
    p.setAmmo(-1);

    //Shoot entity if present
    //Alien
    if(arrMap1[locY][locX - 1] == alien.getAvatar_Alien())
    {
        //Tell player attacking alien
        pB->attacks(alien.getAvatar_Alien());
        //Take away 1 health point from alien
        alien.setHealth_Alien(-1);
        cout << "\nAlien killed!\n\n";

        //Give points
        p.setPts(alien.getPoints_Alien());

        //Remove alien from map
        arrMap1[locY][locX] == map1.getTile();

        //Reset alien health for other aliens
        alien.setHealth_Alien(1);
    }//End murdering Alien
    //Virus
    else if(arrMap1[locY][locX - 1] == virus.getAvatar_Virus())
    {
        //Tell player attacking virus
        pB->attacks(virus.getAvatar_Virus());
        //Show and remove virus health
        cout << "\nVirus Health: " << virus.getHealth_Virus()
             << endl << endl;
        virus.setHealth_Virus(-1);

        //If virus killed
        if(virus.getHealth_Virus() == 0)
        {
            cout << "\nVirus Killed!\n\n";

            //Give points
            p.setPts(virus.getPoints_Virus());

            //Remove virus from map
            arrMap1[locY][locX - 1] == map1.getTile();

            //Reset virus health for other viruses
            virus.setHealth_Virus(3);
         }
      }//End murdering Virus
      //Giant
      else if(arrMap1[locY][locX - 1] == giant.getAvatar_Giant())
      {
         //Tell player attacking giant
         pB->attacks(giant.getAvatar_Giant());
         //Show and remove giant health
         cout << "\nGiant Health: " << giant.getHealth_Giant()
             << endl << endl;
         giant.setHealth_Giant(-1);

         //If giant killed
         if(giant.getHealth_Giant() == 0)
         {
            cout << "\nGiant Killed!\n\n";

            //Give points
            p.setPts(giant.getPoints_Giant());

            //Remove Giant from map
            arrMap1[locY][locX - 1] == map1.getTile();

            //Reset Giant health for other giants
            giant.setHealth_Giant(5);
         }
      }//End murdering Giant
      else cout << endl;
   }//End if p.getAmmo() > 0
}//End shoot left

//shoot right
else if(wasd == 'l')
{
   action = true;

   //Check if still has ammo
   if(p.getAmmo() <= 0)
      cout << "\nNo more ammo!\n";
   else if(p.getAmmo() > 0)
   {
      //Remove bullet
```

```
p.setAmmo(-1);

//Shoot entity if present
//Alien
if(arrMap1[locY][locX + 1] == alien.getAvatar_Alien())
{
   //Tell player attacking alien
   pB->attacks(alien.getAvatar_Alien());
   //Take away 1 health point from alien
   alien.setHealth_Alien(-1);
   cout << "\nAlien killed!\n\n";

   //Give points
   p.setPts(alien.getPoints_Alien());

   //Remove alien from map
   arrMap1[locY][locX + 1] == map1.getTile();

   //Reset alien health for other aliens
   alien.setHealth_Alien(1);
}//End murdering Alien
//Virus
else if(arrMap1[locY][locX + 1] == virus.getAvatar_Virus())
{
   //Tell player attacking virus
   pB->attacks(virus.getAvatar_Virus());
   //Show and remove virus health
   cout << "\nVirus Health: " << virus.getHealth_Virus()
       << endl << endl;
   virus.setHealth_Virus(-1);

   //If virus killed
   if(virus.getHealth_Virus() == 0)
   {
      cout << "\nVirus Killed!\n\n";

      //Give points
      p.setPts(virus.getPoints_Virus());

      //Remove virus from map
      arrMap1[locY][locX + 1] == map1.getTile();

      //Reset virus health for other viruses
      virus.setHealth_Virus(3);
   }
}//End murdering Virus
```

```
        //Giant
        else if(arrMap1[locY][locX + 1] == giant.getAvatar_Giant())
        {
            //Tell player attacking giant
            pB->attacks(giant.getAvatar_Giant());
            //Show and remove giant health
            cout << "\nGiant Health: " << giant.getHealth_Giant()
                 << endl << endl;
            giant.setHealth_Giant(-1);

            //If giant killed
            if(giant.getHealth_Giant() == 0)
            {
                cout << "\nGiant Killed!\n\n";

                //Give points
                p.setPts(giant.getPoints_Giant());

                //Remove Giant from map
                arrMap1[locY][locX + 1] == map1.getTile();

                //Reset Giant health for other giants
                giant.setHealth_Giant(5);
            }
        }//End murdering Giant
        else cout << endl;
    }//End if p.getAmmo() > 0
}//End shoot right

//If player us dead
else if(p.getHealth() == 0)
{
    cout << "\nYou Have Died!!\n\n"
         << "Final Score: " << p.getPts() << endl;
    break;
}

//If wrong character, cls to avoid duplicating screen
else system("cls");

//Display map
for (int y = 0; y < map1.getMapY(); y++)
{
    for (int x = 0; x < map1.getMapX(); x++)cout << arrMap1[y][x]<<" ";
    cout<<endl;
}
```

```
        //Clear some entities off the map
        arrMap1[randnumY(&locY, &locX)][randnumX(&locY, &locX)] = map1.getTile();

        //Display player info
        cout << p;

    }while(isGameRunning); //End game loop

    //Free allocated memory
    cout << "Exiting";
    for(int i = 0; i < map1.getMapY(); ++i)
    {
        cout << ".";
        delete [] arrMap1;
    }
    delete [] arrMap1;
    delete sB;
    delete pB;
    delete pU;

    //Exit program
    system("PAUSE");
    return 0;
}//End method main

//Function Prototypes
//Start method randnumX
int randnumX(int *y, int *x)
{
    //Declare function variables
    int randN; // Holds random number
    //Set random number seed
    srand(time(0));

    //If denominator will be 0, return var y
    if(((*x + 1) - *y) <= 0)return *y;
    else
        //Keeps number between locX and locY
                                                                                    randN = *y
+ rand() % ((*x + 1) - *y);

    //Return the random number
                                                                                  return randN;
}//End method randnumX
```

```
//Start method randnumY
int randnumY(int *y, int *x)
{
    //Declare function variables
    int randN; // Holds random number

    //If denominator will be 0, return var y
    if(((*x + 1) - *y) <= 0)return *y;
    else
        //Keeps number between locX and locY
                                                                        randN = *y
+ rand() % ((*x + 1) - *y);

    //Return the random number
                                                                      return randN;
}//End method randnumY
```