CSC 5: Final Project

Superheroes VS. The Ultimate Villains

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CSC 5 Section: 46091

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Introduction:

Title: Superheroes VS. The Computer Machinery

This game revolves around the idea of a computer apocalypse taking over the world. When the tail of comet LEHR passes through Earth's atmosphere, humanity's worst nightmares come to life as machines gradually develop minds of their own, turning on their creators in bloody rebellion. These machines created the ultimate robot villains to destroy the world, such as the Joker, Ultron, and Lex Luther. At a small college in the City of Riverside, California, both students and professors alike are coming to grips with the horror as a series of increasingly bizarre accidents occur, some injurious, some near fatal, and some fatal. The terror finally comes to a start when the villains begin to destroy the world. It is up to the students of CSC 5 to save the world and to reach out to a Great Hero to save our world from destruction!

The beginning of the game required the user to select a superhero to save the world and battle against the ultimate villains. From there on, the game will prompt the user to select an action for the hero to perform, such as to attack, recovery, and cast magic spells. Within the game, the user will be allowed to fight on a one-on-one basis with the villain and switch between different characters.

Example:

/*

When the tail of rogue comet Rhea-M passes through Earth's atmosphere, humanity's worst nightmares come to life as machines gradually develop minds of their own, turning on their creators in bloody rebellion. At a small college in the City of Riverside, California, both students and professors alike are coming to grips with the horror as a series of increasingly bizarre accidents occur, some injurious, some near-fatal, and some fatal. The terror finally comes to a start when the Computer Machinery begins to destroy the world. It is up to the students of CSC 5 to save the world and to reach out to a Great Hero to save our world from destruction!

Will the superhero be able to get there in time? What will be the outcome of this great battle?!

The world is in deep trouble! Please pick a superhero to save our world from the evil COMPUTER MACHINERY!

Your choices are Superman, Batman, and Ironman!

The world rest in the palm of your hands! What are you waiting for!!

Choose a superhero!:

USER WILL BE REQUIRED TO INPUT SUPERHERO NAME:

1: Superman:

> As an influential superhero, Superman possesses extraordinary powers, faster than a speeding bullet. More powerful than a locomotive. Able to leap tall buildings in a single bound...It's Superman!

2: Batman:

> Batman has no inherent superhuman powers; he relies on his own scientific knowledge, detective skills, and athletic prowess. Batman is regarded as one of the world's greatest detectives, if not the world's greatest crime solver. Batman has been repeatedly described as having a genius-level intellect, one of the greatest martial artists in the DC Universe.

3: Iron Man:

> Iron Man possesses powered armor that gives him superhuman strength and durability, flight, and an array of weapons. Iron Man's standard offensive weapons have always been the repulsor rays that are fired from the palms of his gauntlets. Other weapons include the uni-beam projector in his chest, pulse bolts, and an electromagnetic pulse generator.

Type Superman, Batman, and Iron Man.

*/

This game will enable user to experience how it's like to save the world, as well as enjoy the game with unique strategies.

*** Within the game, once villains are defeated they will drop collectable items that will be stored in a dynamic array for pick up and a list for reference. ***

Summary/Description:

Project Size: 395

Throughout this project, many concepts were utilize from all of the chapters that we have went over. This specific code consist of a do while loop that allow user to select the hero of choice to fight, as well as to restart the game after a win or lost. Within this loop, there are switch statements incorporated to allow user to determine the actions that the superhero will make and select the correct case. Furthermore, inside these cases there exist many if-else and if statements to determine the appropriate damage taken by the hero and villain, as well as if the attack was successful or not. In addition, the output, main fighting sequence, and the character selection are all a part of their own functions and stored within a single dimensional array. This game also incorporates a string 2 dimensional array that stores the different villains the characters will be fighting, as well as their unique attack moves. Lastly, the code also has a dynamic array that

stores and list all of the items that user can receive as a prize, if they're able to defeat the villains. This whole game loops and user can play multiple times.

Pseudocode:

Main

Introduction to story and selection of heroes

Choose which superhero to save the world

Star battle between superhero and computer machinery villains

Select action for input

Execute the action

Attack/Defense/Recovery

Computer Machinery's life/health

If Computer Machinery is destroyed >0, then exit loop

Determine output of Computer Machinery's counter attack

Determine the amount of damage

Recovery both HP/MP

If superhero's life/health is <0 then game is over

Else: The chosen superhero saves the world and receives the prize bounty!

References:

1. Cplusplus.com - The C++ Resources Network." *Cplusplus.com - The C++ Resources Network*. N.p., n.d. Web. 21 July 2015.
2. Gaddis, Tony. *Starting out with C*. Boston: Pearson Addison-Wesley, 2012. Print.

Major Variables:

Major Variable			
Type	**Variable Name**	**Description**	**Location**
Integer	HP	of hero/villain	Global Variable
	MaxHP	of hero/villain	Global Variable
	MP	of hero/villain	Global Variable
	MaxMP	of hero/villain	Global Variable
	AD	of hero/villain	Global Variable
	armor	of hero/villain	Global Variable
	AP	of hero/villain	Global Variable
	MR	of hero/villain	Global Variable
	pots	Specifically only hero	Global Variable
	invSz	List of items dropped	Global Variable
	role	Selection of characters	Int main ()
	newItem	Items dropped by villain	Int main ()
	STATS	Stats of hero	Choosehero(role)
	fightINIT	Start of fight	Choosehero(role)
	choiceP	Selection of atk	fightINIT ()
	choiceE	Selection of villain	fightINIT ()
	randATK	Random damage by villain	fightINIT ()
	villainAttack	Types of villain's atk	fightINIT ()
String	finalHero	Selection of final hero	Global Variable
String 2D Array	villains[3][3]	2D Array of villain skills/atk	Global Variable
String Dynamic Array	string*inventory	Hold random items	Global Variable
String 1D Array	droppedItems[]	Random item drops	Global Variable
	input	Input hero	Void choosehero
	chosenHero	Selection of hero	Void choosehero
	chosenVillan	Random villain selection	fightINIT ()
	chosenVillanAtk	Random villain atk	fightINIT ()
Short Array	enemSts[STATS]	Storage of stats	Int main ()
	superm[STATS]	Storage of stats	Int main ()
	batm[STATS]	Storage of stats	Int main ()
	ironm[STATS]	Storage of stats	Int main ()
	charSts[STATS]	Storage of stats	Int main ()
Boolean	win	Loop of game	Int main ()
Char	choice	Input of hero name	Int main ()
	pickUp	Villain drop items	Int main ()

Major Construct:

Chapters	New syntax and Keywords	Location
Chapter 1	Equality'operators'and'relational' operators'(==,'!=,'>,'=,'<=)	int HP = 0;
	Arithmetic'operators'(+,'R,'*,'/)	cout<<"\nA ";
	Punctuation'(,''&';)	cout << "Good Bye!"<< endl;
Chapter 2	Special'Characters'(||,'#,',{,},")	#include <iostream>
	The'"cout"'Objects	cout << "Would you like to play again? [Y/N]: ";
	The'"endl;"'Manipulator'	cout << "Would you like to play again? [Y/N]: ";
	The'"include"'Directive	#include <iostream>
	Variable'and'Literals'(int';')	int invSz=9;
	The'indentifier''(if,'void,'return,' const,'float,'switch,'char,'case,' break)	void getStory();
	Integer'Data'Type'(short,'long,' float)	short charSts[STATS];
Chapter 3	The'"cin"'Object	cin >> choice;
	Type'Casting	throughout code
	Constant'and'Array'Sizes	string droppedItems[];
Chapter 4	If'statements'	if(chosenHero=="Superman"){
	If/Else'statements	else if(chosenHero=="Batman"){
	The'conditional'operator'	throughout code
	Switch'and'break'statements	break;
Chapter 5	The'for'loop	for(int i = 0; i < heroesList.size(); i++){
	The'increment'and'decrement' operator'(++,'__)	if(areYouSure=='N'||areYouSure=='n'){
	The'while'loop'	while(areYouSure=='N'||areYouSure=='n'||chosenHero=="");
Chapter 6	Return type:	return result;
	Name:	char areYouSure;
	Parameter list:	throughout code
	Body: {}	{200, 200, 200, 200, 50, 15, 50, 30};
	Function prototypes "voids"	void printStory();
	Value-Returning function	return result;
	Returning boolean	bool result;
	Local and Global Variables	string finalHero;
	Static local variable	srand(static_cast<unsigned int>(time(0)));
	Overloading function	int fightINIT(short[], short[], int);
Chapter 7	Array	throughout code
	1D Array	string droppedItems[]
	2D Array	string villans[3][3]
	Array of Strings	string droppedItems[] =;
Chapter 8	Linear search	newItem=rand()%9;

	Sorting and searching vectors	vector<string> heroesList(3);
Chapter 9	Dyanamic Array	string *inventory = new string[9];
Chapter 10	Character case conversion	(areYouSure=='N'||areYouSure=='n'||chosenHero=="");
Chapter 12	Fstream	fstream story;

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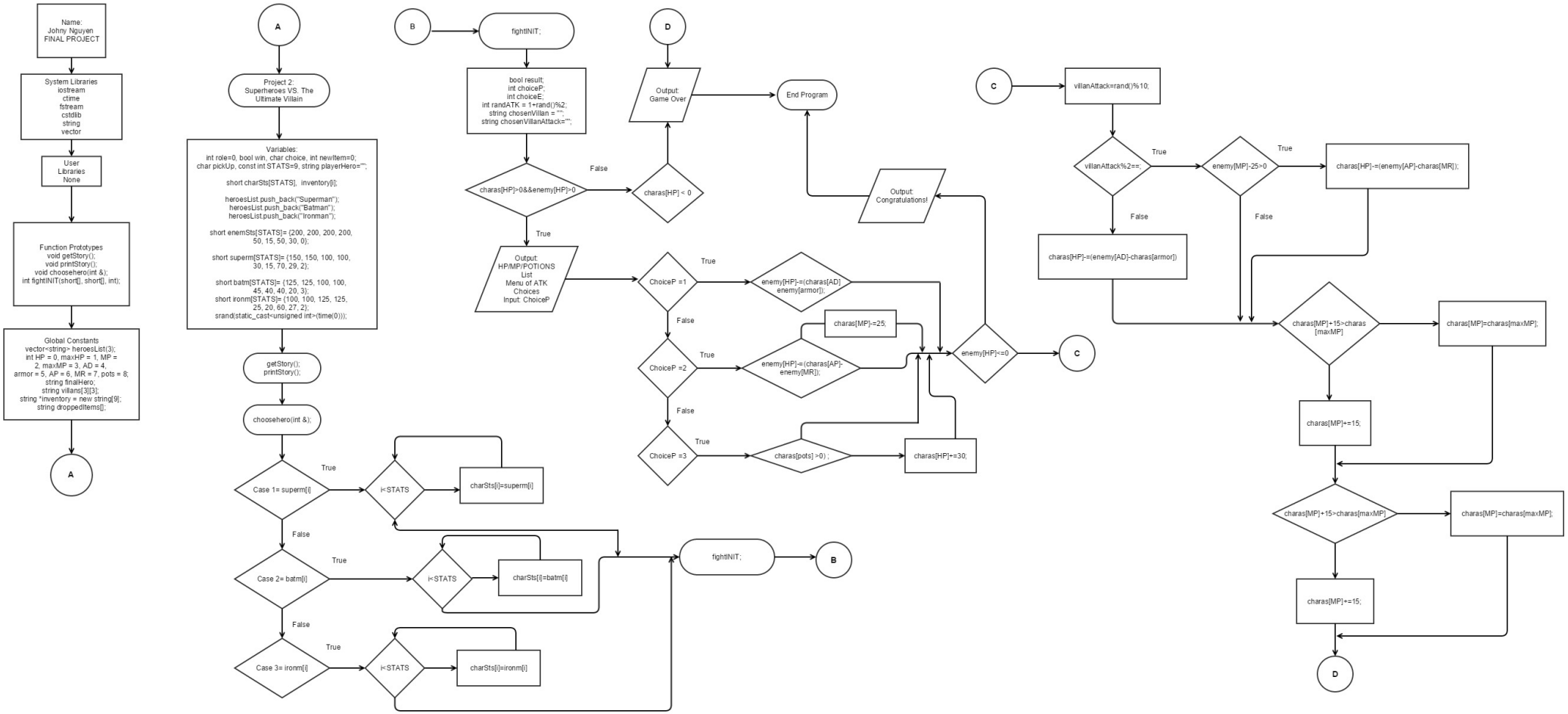

CSC 5 Final Project:
Superheroes VS.The Ultimate Villains

Project Code:

```
/*
 * File:   main.cpp
 * Author: Johny Man Nguyen
 * Project: SUPER HEROES VS. The Computer Machinery
 * Created on July 27, 2015, 12:56 AM
 */

#include <iostream>
#include <ctime>
#include <fstream>
#include <cstdlib>
#include <string>
#include <vector>

using namespace std;

//Function Prototypes
void getStory();
void printStory();
void choosehero(int &);
int fightINIT(short[], short[], int);

//Global variables
vector<string> heroesList(3); //create list of valid heroes
int HP = 0;     //positions of said stats
int maxHP = 1;
int MP = 2;
int maxMP = 3;
int AD = 4;
int armor = 5;
int AP = 6;
int MR = 7;
int pots = 8;
string finalHero; //Hero chosen by user
                  //     0        1        2
string villans[3][3] = { {"Lex Luthor","Joker", "Ultron"},          //0
                         {"Kryptonite","laughing gas", "hacking"},   //1
                         {"intelligence","knife","manipulation"} };  //2
string *inventory = new string[9]; //creates an inventory of 9 using dynamic array
int invSz=9;
string droppedItems[] = {"wallet", "hammer", "shield", "knife", "gold", "keys", "small
box", "lottery ticket", "pistol", "watch"};

//Execution Begins
int main() {
```

```
   int role=0;  //1 == Superman, 2 == Batman, 3 == Ironman
   bool win; //bool that determines if you won the round
   char choice; //at the end of the game: true=continue playing, false=discontinue
   int newItem=0; //will later use as a position/reference to random item selected
   char pickUp; // ==Y:pick up item, ==N:don't pick up item
   const int STATS=9;
   string playerHero="";

   short charSts[STATS];

   for(int i = 0; i < invSz; i++){
      inventory[i]="Empty slot";
   }

   heroesList.push_back("Superman");
   heroesList.push_back("Batman");
   heroesList.push_back("Ironman");

   short enemSts[STATS]= {200, 200, 200, 200, //HP, MaxHP, MP, MaxMP
                          50, 15, 50, 30, 0}; //Attack, Defense, Magic Atk, Magic Def, crit%, pot

   short superm[STATS]= {150, 150, 100, 100, //HP, MaxHP, MP, MaxMP
                         30, 15, 70, 29, 2}; //Attack, Defense, Magic Atk, Magic Def, crit%, pot

   short batm[STATS]= {125, 125, 100, 100, //HP, MaxHP, MP, MaxMP
                       45, 40, 40, 20, 3}; //Attack, Defense, Magic Atk, Magic Def, crit%, pot

   short ironm[STATS]= {100, 100, 125, 125, //HP, MaxHP, MP, MaxMP
                        25, 20, 60, 27, 2}; //Attack, Defense, Magic Atk, Magic Def, crit%, pot

   //Introductory Story

   // cout<<"When the tail of rogue comet Rhea-M passes through Earth's
atmosphere, humanity's worst nightmares "<<endl;
   // cout<<"come to life as machines gradually develop minds of their own, turning
on their creators in bloody rebellion. "<<endl;
   // cout<<"At a small college in the City of Riverside, California, both students and
professors alike are coming to grips with the horror"<<endl;
   // cout<<"as a series of increasingly bizarre accidents occur, some injurious, some
near-fatal, and some fatal."<<endl;
   // cout<<"The terror finally comes to a start when the Computer Machinery
begins to destroy the world."<<endl;
   // cout<<"It is up to the students of CSC 5 to save the world and to reach out to a
Great Hero to save our world from destruction!"<<endl;
   // cout<<"Will the superhero be able to get there in time? What will be the
outcome of this great battle?!"<<endl<<endl<<endl;
```

```
   //seed random number based on Computer's current time
   srand(static_cast<unsigned int>(time(0)));
   //srand is a function that takes in a parameter, and creates a psuedo-random
number based on it

   getStory();

   printStory();

   do{

      choosehero(role);

      switch(role){
         case 1:
            for(int i=0;i<STATS;i++){
               charSts[i]=superm[i];
            }
            break;
         case 2:
            for(int i=0;i<STATS;i++){
               charSts[i]=batm[i];
            }
            break;
         case 3:
            for(int i=0;i<STATS;i++){
               charSts[i]=ironm[i];
            }
            break;
      }

      win=fightINIT(charSts,enemSts,STATS);

      switch(win){
         case 1:
            cout<<"************************************************************\n\n";
            cout<<"The Computer Machinery have acquired a circuit malfunction and
begins to spark. You are ready for the finishing blow, but as you do, Computer
Machinery"<<endl;  //Display Game victory message
            cout<<"catches on fire and explodes into oblivion. Earth is now saved! The
planet owes you one!!"<<endl;
            newItem=rand()%9;

            cout<<"\nA " << droppedItems[newItem] << " was dropped. Would you like
to pick it up? [Y/N]: ";
```

```
            cin>>pickUp;
            break;
         case 0:
            cout<<"**********************************************************\n";
            cout<<"The Computer Machinery strikes a fatal blow to your artery. He
electrocutes your entire body, before turning you into ashes!"<<endl;
//Display Game over message
            cout<<"The fate of the Earth is in question! You have failed saving the
world!!"<<endl;
            cout<<"Game Over!!" << endl;
            break;
      }

      if(pickUp=='Y'||pickUp=='y'){
         int emptySlot=-1;
         for(int i = 0; i < invSz; i++)
            if(inventory[i]=="Empty slot") emptySlot = i;

         if(emptySlot!=-1) inventory[emptySlot] = droppedItems[newItem];
         else //if no empty slot was found (emptySlot still equals -1)
            cout << "You have no space in your inventory." << endl;
      }

      cout<<endl;

      cout << "Would you like to play again? [Y/N]: ";
      cin >> choice;
      cout <<"\n**********************************************************\n"<<
endl;
   }while(choice=='Y' || choice=='y');

   //display inventory
   cout << "Thanks for playing! Here are your bounties: \n";
   for(int i = 0; i < invSz; i++){
      if(inventory[i]!="Empty slot")
         cout << '\t' << i+1 << ". " << inventory[i] << endl;
   }
   cout << endl;
   cout << "Good Bye!"<< endl;

   return 0;
}
/* ************************************************************************** */

void getStory(){
   fstream story;
```

```
   story.open("story.txt"); //create a file called "story.txt"...if "story.txt" does not exist, it will create it

   story<<"When the tail of rogue comet Rhea-M passes through Earth's atmosphere, humanity's worst nightmares "<<endl;
   story<<"come to life as machines gradually develop minds of their own, turning on their creators in bloody rebellion. "<<endl;
   story<<"These machines created the ultimate robot villains to destroy the world, such as the Joker, Ultron, and Lex Luther.  "<<endl;
   story<<"At a small college in the City of Riverside, California, both students and professors alike are coming to grips with the horror"<<endl;
   story<<"as a series of increasingly bizarre accidents occur, some injurious, some near-fatal, and some fatal."<<endl;
   story<<"The terror finally comes to a start when the ultimate villains begins to destroy the world."<<endl;
   story<<"It is up to the students of CSC 5 to save the world and to reach out to a Great Hero to save our world from destruction!"<<endl;
   story<<"Will the superhero be able to get there in time? What will be the outcome of this great battle?!"<<endl<<endl<<endl;
   story.close();
}

void printStory(){
   string line;
   fstream story;
   story.open ("story.txt");

   while (getline(story,line)){ //works the same way as "while(cin>>choice)". It will output line by line until it reads eof (end of file)
      cout<<line<<"\n";
   }
   story.close();
}

void choosehero(int &role){
   //Declare Local Variables
   char areYouSure; // either Y/N
   string input; // user input hero
   string chosenHero = "";

   cout<<"The world is in deep trouble! Please pick a superhero to save our world from the evil COMPUTER MACHINERY! "<<endl<<endl;
   cout<<"The world rest in the palm of your hands! What are you waiting for!! "<<endl<<endl;
   cout<<"Choose a superhero!: ";
   cin>>input;
```

```
   do{
      for(int i = 0; i < heroesList.size(); i++){
         if(heroesList.at(i)==input) chosenHero=heroesList.at(i); //standard linear
search to find the hero in the list
      }

      if(chosenHero=="Superman"){
         cout<<"1: Superman: \tAs an influential superhero, Superman possesses
extraordinary powers,"<<endl;
         cout<<"\t\tfaster than a speeding bullet. More powerful than a locomotive.
"<<endl;
         cout<<"\t\tAble to leap tall buildings in a single bound...It's
Superman!"<<endl<<endl;
         cout<<"Are you sure you want to pick Superman? [Y/N]: ";
         cin>>areYouSure;
      }
      else if(chosenHero=="Batman"){
         cout<<"2: Batman:   \tBatman has no inherent superhuman powers; he relies
on his own scientific knowledge, detective skills, and athletic prowess." <<endl;
         cout<<"\t\tBatman is regarded as one of the world's greatest detectives, if not
the world's greatest crime solver."<<endl;
         cout<<"\t\tBatman has been repeatedly described as having a genius-level
intellect, one of the greatest martial artists in the DC Universe."<<endl<<endl;
         cout<<"Are you sure you want to pick Batman? [Y/N]: ";
         cin>>areYouSure;
      }
      else if(chosenHero=="Ironman"){
         cout<<"3: Ironman: \tIronman possesses powered armor that gives him
superhuman strength and durability, flight, and an array of weapons. "<<endl;
         cout<<"\t\tIron Man's standard offensive weapons have always been the
repulsor rays that are fired from the palms of his gauntlets."<<endl;
         cout<<"\t\tOther weapons include the uni-beam projector in his chest, pulse
bolts, and an electromagnetic pulse generator. "<<endl<<endl;
         cout<<"Are you sure you want to pick Ironman? [Y/N]: ";
         cin>>areYouSure;
      }
      else{
         cout << "Not a valid hero. Please choose a hero: ";
         cin>>input;
      }

      if(areYouSure=='N'||areYouSure=='n'){
         cout<<"Choose a superhero!: " << endl;
         cin>>input;
      }
```

```
}while(areYouSure=='N'||areYouSure=='n'||chosenHero=="");

if(chosenHero=="Superman"){
   role = 1;
   finalHero="Superman";
}
else if(chosenHero=="Batman"){
   role = 2;
   finalHero="Batman";
}
else if(chosenHero=="Ironman"){
   role = 3;
   finalHero="Ironman";
}

//Displays stats for chosen hero
switch (toupper(role)){
   case 1: //Selection of Superman
      cout<<"Superman stats:"<<endl;
      cout<<"\tHP=150"<<endl;
      cout<<"\tMP=100"<<endl;
      cout<<"\tAttack=30"<<endl;
      cout<<"\tDefense=15"<<endl;
      cout<<"\tMagic Attack=75"<<endl;
      cout<<"\tMagic Defense=29"<<endl;
      cout<<"\tPotions=2\n\n"<<endl;
      break;
   case 2: //Selection of Batman
      cout<<"Batman stats:"<<endl;
      cout<<"\tHP=125"<<endl;
      cout<<"\tMP=100"<<endl;
      cout<<"\tAttack=45"<<endl;
      cout<<"\tDefense=40"<<endl;
      cout<<"\tMagic Attack=40"<<endl;
      cout<<"\tMagic Defense=20"<<endl;
      cout<<"\tPotions=3\n\n"<<endl;
      break;
   case 3://Selection of Iron Man
      cout<<"Ironman stats:"<<endl;
      cout<<"\tHP=100"<<endl;
      cout<<"\tMP=100"<<endl;
      cout<<"\tAttack=25"<<endl;
      cout<<"\tDefense=20"<<endl;
      cout<<"\tMagic Attack=60"<<endl;
      cout<<"\tMagic Defense=27"<<endl;
      cout<<"\tPotions=2\n\n"<<endl;
```

```
        break;
    }
}

int fightINIT(short charas[], short enemy[], int STATS){
    srand(static_cast<unsigned int>(time(0)));

    bool result;
    int choiceP;
    int choiceE;
    int randATK = 1+rand()%2; //rand()%2 will give you a random number: either 0
or 1. 1+ : 1 or 2
    string chosenVillan = "";
    string chosenVillanAttack="";

    if(finalHero=="Superman"){
        chosenVillan = villans[0][0]; // Lex Luthor
        chosenVillanAttack = villans[randATK][0];
    }
    else if(finalHero=="Batman"){
        chosenVillan = villans[0][1]; // Joker
        chosenVillanAttack = villans[randATK][1];
    }
    else if(finalHero=="Ironman"){
        chosenVillan = villans[0][2]; // Ultron
        chosenVillanAttack = villans[randATK][2];
    }

    cout<<"Battle Begins!\n";

    cout<<"When the world seems to be lost, a great superhero suddenly appears!
Once in, you see a world like no other and that humanity is in the palm of your
hands!"<<endl;
    cout<<"Within the sudden flood of terror and destruction, you see civilians
running away from the horrible terror and seeking for safety!"<<endl;
    cout<<"The clouds are getting darker and you can hear the echoes of " <<
chosenVillan << " coming towards you!"<<endl;
    cout<<"His evil is all over the place and you can feel the shock flowing through
your body and veins!"<<endl;
    cout<<"What will you do now?!"<<endl<<endl;

    enemy[HP] = 200;
    while (charas[HP]>0&&enemy[HP]>0){
//Loop fight sequence as long as player HP and enemy HP are larger than 0
```

```
      cout<<"Your HP: "<<charas[HP]<<"/"<<charas[maxHP]<<"         " <<
chosenVillan << " HP: "<<enemy[HP]<<"/"<<enemy[maxHP]<<endl;
//Display Player and Enemy Health
      cout<<"Your MP: "<<charas[MP]<<"/"<<charas[maxMP]<<"         " <<
chosenVillan << " MP: "<<enemy[MP]<<"/"<<enemy[maxMP]<<endl;
//Display Player and Enemy Magic Points
      cout<<"Potions: "<<charas[pots]<<endl<<endl;
      cout << "**********************************************************\n" << endl;
      cout<<"What will you do? (Enter the Number for the chosen action)"<<endl;
//Display the menu of options for the player actions
      cout<<"1. Attack \t 3. Potion"<<endl;
      cout<<"2. Magic"<<endl;
      cout << "Your move: ";
      cin>>choiceP;
      cout<<endl;

      switch (choiceP){                                          //Read in player choice
        case 1:
            cout<<"You physically attack "<< chosenVillan << " for "<< (charas[AD]-
enemy[armor])<< " damage."<<endl;                          //Deal damage to enemy
            enemy[HP]-=(charas[AD]-enemy[armor]);
          break;
        case 2:
            cout<<"You use Ability Power to attack " << chosenVillan<<" for
"<<(charas[AP]-enemy[MR])<<" damage."<<endl;
            enemy[HP]-=(charas[AP]-enemy[MR]);
//If true:Deal damage to enemy
            charas[MP]-=25; //magic abilities cost 25MP
          break;
        case 3:                                                    //Player uses a potion
          if (charas[pots] >0){
//Check if potions are available
            cout<<"You use a potion to recover 30 Health Points."<<endl;
//Player recovers 40HP
            charas[HP]+=30;
            charas[pots]--;
//Remove one potion
          }else{
            cout<<"You have no more potions!"<<endl;
          }
          break;
      }

      if (enemy[HP]<=0){                  //Check if enemy is dead, stop fight if true
        break;
      }
```

```
      int villanAttack=rand()%10;
      if (villanAttack%2==0){
//20% chance of using magic
         if (enemy[MP]-25>0){
//Check if enemy has MP
            cout<< chosenVillan<<" uses " << chosenVillanAttack << " against you! It
does "<<(enemy[AP]-charas[MR])<<" damage."<<endl;              //Deal damage if
true, subtract MP from enemy
            charas[HP]-=(enemy[AP]-charas[MR]);
            enemy[MP]-=25;
         }else{
            cout<<"Attack misses you!"<<endl;                          //No damage dealt if
false
         }
      }else{                                                                  //Enemy attacks
         cout<< chosenVillan << " uses a basic attack and deals " <<(enemy[AD]-
charas[armor])<<" damage."<<endl;                  //Deal damage
         charas[HP]-=(enemy[AD]-charas[armor]);
      }

      //restores MP after each round
      if (charas[MP]+15>charas[maxMP]){ //note: charas[3] originally
//Check if MP recovery needed for both characters
         charas[MP]=charas[maxMP];
      }else{
         charas[MP]+=15;
//Recover up to 15 MP per turn for both characters
      }

      if (enemy[MP]+15>100){
         enemy[MP]=100;
      }else{
         enemy[MP]+=15;
      }

   //final results
   if (charas[0]<=0) result = false;
   else if (enemy[0]<=0) result = true;
   else cout << "An eror occured." << endl;

   return result;
}
```