Midterm CSC242 Name: Jessica Susanto

**This test is open book, use visual studio for problems below. Do not seek assistance, do not copy/paste code from the internet. ONLY use the concepts we have studied in class.**

**You have two hours to write the programs below and submit a hardcopy of the code and sample runs:**

1. Write a program that reads in( prompt user to enter) investment amount, annual interest rate, and the number of years and displays the future investment value using the following formula



#include <iostream>

#include <iomanip>

using namespace std;

int main()

{

// prompt user to enter investment amount, annual interest rate, and the number of years

cout << "Enter investment amount: \n";

double invest;

cin >> invest;

cout << "Enter annual interest rate: \n";

double interest;

cin >> interest;

cout << "Enter number of years: \n";

double year;

cin >> year;

// displays the future investment value

double future = invest \* pow((1 + (interest / 1200)), (year \* 12));

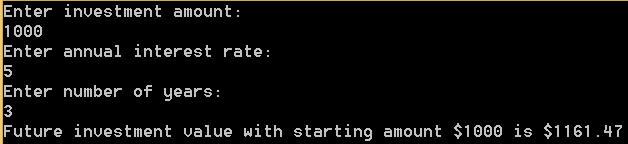
cout << "Future investment value with starting amount $" << invest

<< " is $" << fixed << setprecision(2) << future << endl;

system("pause");

return 0;

}



1. Prompt user to enter a sentence (at least two words), your program should read the sentence in a string type.
   1. Write code to display the string.
   2. Write code to show the length of the string
   3. Change the character at index 4 to an upper case and display the string.
   4. Use a function call to check if the 3rd character in the string is a digit. If so, then display the string ”third character is a digit” otherwise display “third character is not a digit”.
   5. Change the character at index 5 to character H and display the string again.

#include <iostream>

#include <string>

using namespace std;

int main()

{

// Prompt user to enter a sentence (at least two words)

string s;

cout << "Enter a sentence (minimum of two words): \n";

getline(cin, s);

// Write code to display the string

cout << "Your sentence is " << s << endl;

//Write code to show the length of the string

cout << "The length of your sentence is " << s.length() << endl;

// Change the character at index 4 to an upper case and display the string

s[4] = toupper(s[4]);

cout << "Your sentence is now " << s << endl;

// Use a function call to check if the 3rd character in the string is a digit.

// If so, then display the string ”third character is a digit”

// otherwise display “third character is not a digit”

if (isdigit(s[2]))

cout << "Third character is a digit\n";

else

cout << "Third character is not a digit\n";

// Change the character at index 5 to character H and display the string again

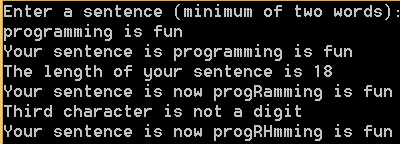
s[5] = 'H';

cout << "Your sentence is now " << s << endl;

system("pause");

return 0;

}



1. Write a program that prompts the user to enter a 3 digit integer. Your program will then separates out the digits and lists them. As an example, if the user enters 453, your program displays: 4 5 3 with a space in between digits.

#include <iostream>

#include <string>

using namespace std;

int main()

{

// prompts the user to enter a 3 digit integer

cout << "Enter a three-digit integer: \n";

string integer;

getline(cin, integer);

// separates out the digits and lists them

int d1, d2, d3;

d1 = integer[0] - 48;

d2 = integer[1] - 48;

d3 = integer[2] - 48;

if (!(isdigit(d1)) || !(isdigit(d2)) || !(isdigit(d1)))

cout << "Invalid input.\n";

else

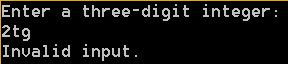
cout << d1 << " " << d2 << " " << d3 << endl;

system("pause");

return 0;

}



****

1. Write a program that plays the popular scissor, rock, paper game. (A scissor can cut a paper, a rock can knock a scissor, and a paper can wrap a rock). The program randomly generates a number 0, 1, 2, representing scissor, rock, or paper. The program prompts the user to enter a number 0, 1, 2 and displays a message indicating whether the user or the computer wins, losses, or draws. Here are sample runs:

**Scissor (0), rock (1), paper (2): 1**

**The computer is scissor, you are rock. You win**

**Scissor (0), rock (1), paper (2): 2**

**The computer is paper, you are paper too, it is a draw**

#include <iostream>

#include <ctime>

#include <cstdlib>

using namespace std;

int main()

{

// program randomly generates a number 0, 1, 2, representing scissor, rock, or paper

srand(time(0));

int comp = rand() % 3;

// prompts the user to enter a number 0, 1, 2

cout << "Enter 0 for scissor, 1 for rock, 2 for paper: \n";

int game;

cin >> game;

switch (comp)

{

case 0: cout << "The computer is scissors.\n"; break;

case 1: cout << "The computer is rock.\n"; break;

case 2: cout << "The computer is paper.\n"; break;

}

switch (game)

{

case 0: cout << "You are scissors.\n"; break;

case 1: cout << "You are rock.\n"; break;

case 2: cout << "You are paper.\n"; break;

default: cout << "Invalid input.\n";

}

// displays a message indicating whether the user or the computer wins, losses, or draws

if (comp == game)

cout << "It is a draw.\n";

else if ((comp == 0 && game == 1) || (comp == 1 && game == 2)

|| (comp == 2 && game == 0))

cout << "You win.\n";

else if ((game == 0 && comp == 1) || (game == 1 && comp == 2)

|| (game == 2 && comp == 0))

cout << "Computer wins.\n";

else

cout << "Unable to determine the winner.\n";

system("pause");

return 0;

}

