**HOMEWORK 4: CS 102, SECTION 1**

**FALL 2024**

**DUE DATE: Monday, September 23 BY 11:59 PM**

NO EXTENSION OF THIS HOMEWORK WILL BE GIVEN BEYOND THIS TIME

Total Points: 25

1. Given the following string. You need to predict the output from each of the expression given below.

string str1 = “Programming is fun”;

1. cout << str1.length( ) << endl;

Ans: 18

1. cout << “x = “ << str1.find(“is”) << endl;
2. Ans: 12
3. cout << str1.substr(6, 3) << endl;

Ans: mmi

1. str1.insert(2, “sts”); cout << str1 << endl;

Ans: Prstsogramming is fun

1. str1.replace(6, 4, “PQRS”); cout << str1 << endl;

Ans: PrstsoPQRSming is fun

1. Write a program that prints a big letter H as shown below.

H H

H H

HHHH

H H

H H

[Hints: You can do this easily if you declare and initialize two strings: string1 and string2 (or can call them by using any other variable name, such as pattern1 and pattern2) and initialize them to the two H’s with two spaces in between in one of the string and other HHHH in another string. Because if you observe these patterns are repeated. Then you can use display statement to display these two string variables as per requirement.]

For example:

If I need to display the following

\*

\*\*

\*\*\*

\*\*

\*

I could use the following

const string str1 = “\*”;

const string str2 = “\*\*”;

const string str3 = “\*\*\*”;

cout << str1 << endl;

cout << str2 << endl;

cout << str3 << endl;

cout << str2 << endl

cout << str1 << end;

Ans:

#include <iostream>

using namespace std;

int main()

{

const string str1 ="H H";

const string str2 ="H H";

const string str3 ="HHHH";

cout << str1 << endl;

cout << str2 << endl;

cout << str3 << endl;

cout << str2 << endl;

cout << str1 << endl;

}

1. Consider the following C++ program in which the statements are in the incorrect order. Rearrange the statements so that it prompts the user to input the radius of a circle and outputs the area and circumference of the circle

#include <iostream>

{

int main( )

cout << “Enter the radius: “;

cin >> radius;

cout << endl;

double radius;

double area;

using namespace std;

return 0;

cout << “Area = “ << area << endl;

area = PI \*radius \* radius;

circumference = 2 \* PI \* radius;

cout << “Circumference = “ << circumference << endl;

const double PI = 3.14;

double circumference;

}

# Correct Format

#include <iostream>

using namespace std;

int main()

{

double radius;

double area;

double circumference;

const double PI = 3.14;

cout << “Enter the radius: ”;

cin >> radius;

area = PI \*radius \* radius;

circumference = 2 \* PI \* radius;

cout << “Circumference = “ << circumference << endl;

cout << “Area = “ << area << endl;

return 0;

}

1. Write a program that will take any amount of money as input (it can be a decimal number). Then find out how many minimum number of coins will be needed, and how many quarters, how many dimes, how many nickels and how many pennies will be required to add up to that money. The following algorithm can be followed.

* Get the value of money (as user input)
* Convert to cents, using the formula: cents = money \* 100 (declare cents as integer)
* numberOfQuarters = cents/25
* cents = cents – 25 \*numberOfQuarters
* numberOfDimes = cents/10
* cents = cents – 10 \* numberOfDimes
* numberOfNickels = cents/5
* numberOfPennies = cents – 5 \* numberOfNickels
* totalNoOfCoins = numberOfQuarters + numberOfDimes + numberOfNickels + numberOfPennies
* Display number of Quarters, Dimes, Nickels, Pennies and the total number of Coins with proper title.

Do not fix the value of money, you need to write an input statement for money.

1. Using if –elseif –else statement, write a program to calculate your grade from the overall score. The overall score is computed from the scores of Homeworks, Tests, Midterm, Final, Labs and Attendance. The overall score is computed from these scores by taking 20% from Homeworks, 10% on Tests, 20% on Midterm, 10% on Labs, 30% on Finals and 10% on attendance.

The mathematical relation is:

Overall Score = 0.20 \* Homeworks + 0.10 \* Tests + 0.20 \* Midterm + 0.10\* Labs + 0.3 \* Finals + 0.10 \* Attendance

The letter Grade (use a character variable for this) is calculated as:

Overall Score Grade

More or equal to 100 A

80 – 89 B

70 – 79 C

60 – 69 D

< 60 F

The inputs are the scores for Homeworks, Tests, Labs, Midterm, Final, and Attendance. All the scores should be in a scale of 0 to 100.