**CSC 1100 – Problem Solving and Programming**

**Homework 4 – rory lange**

**25 points – Due March 11, 11am**

**Late deadline is March 13, 11:59pm, but 20% off**

**a)** Save this document with your name and the homework number somewhere in the file name.

**b)** Type/paste your answers into the document.

**c)** Submit this document to the Canvas item where you downloaded this document.

**1) [2 points]** Describe two techniques for solving an application logic error.

► commenting out cout statements, humayra output comments

► commenting out working code and focus on not working code

**2) [3 points]** Write a validation loop to prompt for and get from the user an integer whose square root is greater than 10.5. If an invalid integer is entered, print an error message and prompt the user again. After the loop, print the integer and its square root.

int input;

cout << "enter an integer whose sqrt is greater than 10.5: ";

cin >> input;

while((double)sqrt(input) <= 10.5) {

cout << "Error: input out of range" << endl;

cout << "Enter a value that's sqrt is greater than 10.5:";

cin >> input;

}

cout << "input: " << input << endl << "sqrt: " << (double)sqrt(input) << endl;

**3) [3 points]** Rewrite the validation loop from Question 2 using a **do-while statement**.

int input;

cout << "enter an integer whose sqrt is greater than 10.5: ";

cin >> input;

if ((double)sqrt(input) <= 10.5) {

do {

cout << "Error: input out of range" << endl;

cout << "Enter a value that's sqrt is greater than 10.5:";

cin >> input;

} while ((double)sqrt(input) <= 10.5);

}

cout << "input: " << input << endl << "sqrt: " << (double)sqrt(input) << endl;

**4) [5 points]** Write a sentinel loop to prompt for and get from the user a series of angles. Continue to prompt for an angle until the sentinel value of your choice is entered. Within the loop, print the sine, cosine, and tangent of the angle. After the loop, print the number of angles processed.

int input = 0;

const int sentinel = 45;

while (input != sentinel) {

cout << "Enter an angle measure: ";

cin >> input;

cout << endl << "Sine: " << sin(input) << endl;

cout << "Cosine: " << cos(input) << endl;

cout << "Tangent: " << tan(input) << endl;

}

**5) [8 points]** Write the number of **for statement** loops that will be performed for each of the following:

|  | Initialization | Condition | Update | Loops? |
| --- | --- | --- | --- | --- |
| a) | i = 7 | i < 11 | i++ | 4 |
| b) | i = 14 | i > 11 | i-- | 3 |
| c) | i = 2020 | i <= 2050 | i = i + 3 | 11 |
| d) | i = 8 | i < 400 | i = i \* 2 | 6 |
| e) | i = 17 | i < 7 | i++ | 0 |
| f) | i = 2 | i < 6 | i = i – 6 | Infinite |
| g) | i = 5 | i != 2 | i = i – 4 | infinite |
| h) | i = 5 | i != 9 | i = i + 2 | 2 |

**6) [2 points]** Why do we use a while statement instead of a for loop to read data from a file?

You have to initialize the value of i when using a for loop. In a while loop you do not have to have a starting value for i.

**7) [2 points]** What is the primary difference between a void function and a value function?

Value functions have to return a value based on the data type that the function is defined.