**WEEK 7 – Review Questions and**

**Programming Challenges Handout**

**Chapter: 4**

**Review Questions:**

1. Assume the variables x = 5, y = 6, and z = 8.

**Indicate if each of the following conditions is true or false:**

A) (x >= 0) || (x <= y) true

B) (z - y) > y false

C) !((z - y) > x) false

**Find the Errors**

1. **Each of the following program segments has errors. Find as many as you can.**

**A)**

#include <iostream>

using namespace std;

int main() {

cout << "Enter your 3 test scores and I will ";

cout << "average them:";

int score1, score2, score3,

cin >> score1 >> score2 >> score3;

double average;

average = (score1 + score2 + score3) / 3.0;

bool perfectScore = false;

if (average = 100){

perfectScore = true; // Set the flag variable

}

cout << "Your average is " << average << endl;

if (perfectScore == true){

cout << "Congratulations!\n";

cout << "That's a perfect score.\n";

cout << "You deserve a pat on the back!\n";

}

}

**B)**

#include <iostream>

using namespace std;

int main() {

double num1, num2, quotient;

cout << "Enter a number: ";

cin >> num1;

cout << "Enter another number: ";

cin >> num2;

if (num2 == 0){

cout << "Division by zero is not possible.\n";

cout << "Please run the program again ";

cout << "and enter a number besides zero.\n";

} else {

quotient = num1 / num2;

cout << "The quotient of " << num1 << " divided by " << num2 << " is " << quotient << endl;

}

}

**C)**

#include <iostream>

using namespace std;

int main() {

int testScore;

cout << "Enter your test score and I will tell you\n";

cout << "the letter grade you earned: ";

cin >> testScore;

if (testScore < 60){

cout << "Your grade is F.\n";

} else if (testScore < 70) {

cout << "Your grade is D.\n";

} else if (testScore < 80) {

cout << "Your grade is C.\n";

} else if (testScore < 90) {

cout << "Your grade is B.\n";

} else if (testScore <= 100) {

cout << "Your grade is A.\n";

} else {

cout << "That is not a valid score.\n";

}

}

**D)**

#include <iostream>

using namespace std;

int main() {

double testScore;

cout << "Enter your test score and I will tell you\n";

cout << "the letter grade you earned: ";

cin >> testScore;

if(testScore < 60.0){

cout << "Your grade is F.\n";

} else if(testScore < 70.0){

cout << "Your grade is D.\n";

} else if(testScore < 80.0){

cout << "Your grade is C.\n";

} else if(testScore < 90.0){

cout << "Your grade is B.\n";

} else if(testScore <= 100.0){

cout << "Your grade is A.\n";

} else {

cout << "That score isn't valid\n";

}

}

**Programming Challenges:**

1. **Geometry Calculator**

Write a program that displays the following menu:

**Geometry Calculator**

1. Calculate the Area of a Circle

2. Calculate the Area of a Rectangle

3. Calculate the Area of a Triangle

4. Quit

Enter your choice (1-4):

If the user enters 1, the program should ask for the radius of the circle and then display its area. Use 3.14159 for π. If the user enters 2, the program should ask for the length and width of the rectangle, and then display the rectangle’s area. If the user enters 3, the program should ask for the length of the triangle’s base and its height, and then display its area. If the user enters 4, the program should end.

***Input Validation:*** *Decide how the program should handle an illegal input for the menu choice or a negative value for any of the other inputs.*

1. **Freezing and Boiling Points**

The following table lists the freezing and boiling points of several substances. Write a program that asks the user to enter a temperature, and then shows all the substances that will freeze at that temperature and all that will boil at that temperature. For example, if the user enters –20 the program should report that water will freeze and oxygen will boil at that temperature.

**Substance Freezing Point (°F) Boiling Point (°F)**

Ethyl alcohol –173 172

Mercury –38 676

Oxygen –362 –306

Water 32 212

**In-Class Lab: Complex if’s**

You will be working for this week – it has its own link.