

# Assignment #3

CPSC 121: Computer Science I

Due: Friday October 5th, 2018 [Blackboard Upload Only]

## Problem 1

Find the errors:

### 1.1

// This program uses a loop to raise a number to a power.

```
#include <iostream>
using namespace std;
int main() {
    int num, bigNum, power, count;
    cout << "Enter an integer: ";
    cin >> num;
    cout << "What power do you want it raised to? ";
    cin >> power;
    bigNum = num;
    while (count++ < power);
        bigNum *= num;
    cout << "The result is << bigNum << endl;
    return 0;
}
```

### 1.2

// Find the error in this program.

```
#include <iostream>
using namespace std;
int main()
{
    int num1 = 0, num2 = 10, result;
    num1++;
    result = ++(num1 + num2);
    cout << num1 << " " << num2 << " " << result;
    return 0;
}
```

## 1.3

// This program averages a set of numbers.

```
#include <iostream>
using namespace std;
int main()
{
    int numCount, total;
    double average;
    cout << "How many numbers do you want to average? ";
    cin >> numCount;
    for (int count = 0; count < numCount; count++)
    {
        int num;
        cout << "Enter a number: ";
        cin >> num;
        total += num;
        count++;
    }
    average = total / numCount;
    cout << "The average is << average << endl;
    return 0;
}
```

## Problem 2

### 2.1

Convert the following while loop to a do-while loop:

```
int x = 1;
while (x > 0) {
    cout << "enter a number: ";
    cin >> x;
}
```

### 2.2

Convert the following do-while loop to a while loop:

```
char sure;
do
{
    cout << "Are you sure you want to quit? ";
    cin >> sure;
} while (sure != 'Y' && sure != 'N');
```

## 2.3

Convert the following for loop to a while loop:

```
for (int x = 50; x > 0; x- -)
{
    cout << x << " seconds to go.\n";
}
```

## Problem 3

The distance a vehicle travels can be calculated as follows:

distance = speed \* time

For example, if a train travels 40 miles per hour for 3 hours, the distance traveled is 120 miles.

Write a program that asks the user for the speed of a vehicle (in miles per hour) and how many hours it has traveled. The program should then use a loop to display the distance the vehicle has traveled for each hour of that time period. Here is an example of the output:

What is the speed of the vehicle in mph? 40 How many hours has it traveled? 3

Hour Distance Traveled

```
-----
1         40
2         80
3        120
```

*Input Validation: Do not accept a negative number for speed and do not accept any value less than 1 for time traveled.*

## Problem 4

Running on a particular treadmill you burn 3.6 calories per minute. Write a program that uses a loop to display the number of calories burned after 5, 10, 15, 20, 25, and 30 minutes.

## Problem 5

Write a program with a loop that lets the user enter a series of integers. The user should enter 99 to signal the end of the series. After all the numbers have been entered, the program should display the largest and smallest numbers entered.

## Problem 6

Write a program that asks the user for a positive integer no greater than 15. The program should then display a square on the screen using the character X. The number entered by the user will be the length of each side of the square. For example, if the user enters 5, the program should display the following:

```
XXXXX
XXXXX
XXXXX
```

XXXXX

XXXXX

If the user enters 8, the program should display the following:

XXXXXXXXXX

XXXXXXXXXX

XXXXXXXXXX

XXXXXXXXXX

XXXXXXXXXX

XXXXXXXXXX

XXXXXXXXXX

XXXXXXXXXX

## Problem 7

Write code that does the following: Opens an output file with the filename Numbers.txt, uses a loop to write the numbers 1 through 100 to the file, and then closes the file.