CSE 1321L: Programming and Problem Solving I Lab

Assignment 3 – 100 points

Selection Statements

What students will learn:

1) Logic using selection structures (if/else and switch statements)
2) Review of I/O (input and output)
3) Review of reading input from the user and storing it into variables
4) Review of doing basic calculations with variables to generate a solution

Overview: For this problem set, you're going to focus on how to use selection statements. These make your program much more interesting because now your program can change behavior based on the state of variables. Again, start early, practice, and ask a lot of questions.

Similar to the last assignment, you're going to start by writing pseudocode to solve the problem (see Module 2 of the Pseudocode Guide on the CCSE FYE Website for more information); this will be submitted as a single, separate assignment. Later (and very similar to the labs), you'll take that pseudocode to generate source code (in Java, C# or C++) and build an actual program. For this part of the assignment, you will submit source files.

As a reminder, naming of your source code assignments is highly important. As such, you must name the file the name of the assignment (e.g. Assignment3A.java, Assignment3A.cpp, Assignment3A.cs). If you're writing in Java or C#, the name of the class must also be that name. For the Java folks, don't include any "package" statements for simplicity.

When submitting source code, we'll also continue to award an extra +5 points if all autograder tests work perfectly (max 65/60).

If you paste your pseudocode into your source code for comments, we recommend not using Word because it inserts "special" characters or "hidden" characters (like the quotes around the word special just now) that aren't UTF-8 (which means "standard"). For example, look at the difference between "," and ". All three quote marks are different and only one of them compiles! Use TextEdit or Notepad for your pseudocode and then copy/paste from there.

Finally, you've heard us say it before, but don't cheat. They say knowledge is power. In programming, knowledge is also money.

Assignment 3A: *We, are never, ever, ever, ever.* A girl named Taylor (who is in no way related to pop phenom Taylor® Swift ©) will not be caught dead in a room with someone she used to date named Fernando. However, you are hosting a party and both of them might attend. At your party, you plan on pairing people together, but you would never pair Taylor and Fernando together, because your party would be ruined.

Your job is to write a program that asks the user to enter the name of a guest, enter the name of a second guest, and then determine whether the guests could be paired together. Note: all pairs are allowable except for Taylor and Fernando.

Extra nerdy points: Can you solve this using only an if/else statement?

```
Sample Output #1:
Enter guest 1: Taylor
Enter guest 2: Fernando
Your party is ruined and another bad pop song will be written.

Sample Output #2:
Enter guest 1: Fernando
Enter guest 2: Taylor
Your party is ruined and another bad pop song will be written.

Sample Output #3:
Enter guest 1: Taylor
Enter guest 2: Jorge
Your party was a hit!

Sample Output #4:
Enter guest 1: Neha
Enter guest 2: Fernando
Your party was a hit!
```

Assignment3B: *Worst. Calculator. Ever.* If you've ever used a Reverse-Polish Notation (RPN) calculator, you recognize that it takes a little getting used to. The basic idea is that you first enter two numbers, then you enter the operator for those two numbers. For example, if you wanted to multiple 5 * 7, you would enter a 5, a 7, and then the * operator.

For this part of the assignment, you are going to ask the user to input two integers (not floats) followed by one of five characters (+, -, *, /, or %). The program should then print out the correct answer. Because the program only accepts integers, division will be integer division (so that may look a little weird). Most importantly, you cannot use an if/else statement in your program (you will receive no credit). You must think of other ways…

Note: See the Appendix for how to read a single character from the console (do not use strings).

```
Sample Output #1:
Enter the first number: 10
Enter the second number: 3
Enter the operator to apply: *
30

Sample Output #2:
Enter the first number: 10
Enter the second number: 3
Enter the operator to apply: /
3

Sample Output #3:
Enter the first number: 10
Enter the second number: 3
Enter the operator to apply: %
1
```

Assignment3C: *Party of 6?* Have you ever noticed that if you're dining in a restaurant and your group size is 6 or more people, they often add an extra 18% gratuity to the bill? Of course, they do this to protect the wait staff so they don't get stuck with a group that leaves no tip (and sadly, that happens!)

Write a program that asks the user to input the number of people in a party as well as the total cost of the bill. If the party is 6 or greater, the program will automatically add 18% to the bill and then ask the user if they want to leave an additional tip. If yes, the user can enter an additional tip and then the program prints the total bill. If the user answers no, then it just prints the total bill. If the party is less than 6, it will ask how much for a tip, then calculate the total bill. You should use the float data type for your variables.

```
Sample Output #1:
How many people in your party? 6
What is the total cost of your bill? 200
Your bill is $236
Would you like to include an additional tip (Y/N)? Y
How much? 25
Total bill is: $261

Sample Output #2:
How many people in your party? 4
What is the total cost of your bill? 300
Your bill is $300
How much for the tip? 25
Total bill is: $325
```

Submission:

1. For the first week, you will submit a single pseudocode document that contains all three sub-assignments.
2. For the second week, you will submit 3 separate files – one for each of the assignments above.
3. Upload your files to the correct assignment submission folder in Gradescope. Do NOT submit homework in D2L.
4. You will receive two parts of a grade. Your pseudocode will be graded for the first 40%. The autograder will assign the remaining 60% of the grade. Remember, the output of your program must match exactly for the autograder to work.
5. We'll work with you on this assignment if something messes up, so long as you submit by the due date.

APPENDIX – Examples of reading in characters in C++, Java and C#

```
//========= C++ ============
#include <iostream>
#include <string>
using namespace std;

int main() {
  int j;
  char c;
  // read an integer
  cin >> j;
  // this is needed because when the user presses
  // the enter/return key, it stays in the system.
  // So, ignore it and move on to the next thing.
  cin.ignore();
  // read a character
  cin.get(c);
  cout << j << " " << c << endl;
}
```

```
//========= Java ===========
import java.util.*;

class Main {
  public static void main(String[] args) {
    Scanner scan = new Scanner (System.in);
    // read an integer
    int j = scan.nextInt();
```

```
    // read a character
    char c = scan.next().charAt(0);
    System.out.println (j+" "+c);
  }
}
```

```
//========= C# ==============
using System;

class Example {
  public static void Main (string[] args) {
    int j;
    char c;
    // read an integer
    j = Int32.Parse(Console.ReadLine());
    // read a character
    c = Console.ReadLine()[0];
    Console.WriteLine(j + " " + c);
  }
}
```