Langara College

# Department of Computing Science & Information Systems

# CPSC1150 – Program Design

###### **Lab4: *switch* Statements and Characters**

**Objectives:**

* Solving problems
* Writing algorithms
* Processing characters
* Implementing algorithms with *switch* statements

**Problems [35 marks]**

**Instructions:**

1. Create a folder named **Lab4** to store all the files from this lab
2. Create an external documentation file (filename: **Lab4Ext.docx**) to store the summary, algorithm(s), and sample input and output for each problem.
3. All your programs must have good internal and external documentations.

**Problem 1: [5 marks] Display the day of a week (**filename: **DisplayDayOfWeek.java)**

Design an algorithm and then write a program that gets an integer between 0 and 6 from the user. Display the corresponding day of the week on the console (0 – Sunday, 1 – Monday, and so on). If the user enters an invalid integer, display an error message. Use a **switch** statement.

**Problem 2: [10 marks] Phone key pads** (filename: **PhoneKeyPads.java**)

The international standard letter/number mapping found on the telephone is show below



Design an algorithm and then write a program that prompts the user to enter a letter (uppercase or lowercase) and displays its corresponding number on the console. When the character is not a letter, display an error message and use System.exit(0) to terminate the program. Use a **switch** statement.

Below are some sample runs:

Enter a letter (uppercase or lowercase): A

A is on the number key 2

Enter a letter (uppercase or lowercase): a

a is on the number key 2

Enter a letter (uppercase or lowercase): +

+ is an invalid input

***Hint***: To read a letter, use the next() method of the Scanner class as follows:

// Assume the Scanner object name is input

String letterString = input.next();

char ch = letterString.charAt(0);

**Problem 3: [20 marks] Find the number of days in a month** (filename: **DaysInMonth.java**)

Design an algorithm and then write a program that prompts the user to enter a month in number and a year, and displays the number of days in that month on the console. If the month is 2, your program should check if it is a leap year. In a leap year there are 29 days in February. Assume that the user will enter all the input correctly.

For example, if the user entered month 2 and year 2016, the program should display that February 2016 has 29 days. If the user entered month 3 and year 2019, the program should display that March 2019 has 31 days.

Use ***switch*** statement to check the month number. To check whether it is a leap year should be performed under the case of month 2 only.

**What to hand in**

Zip the folder **Lab4** which contains all the Java source files and the external documentation file from this lab and upload the zip file to BrightSpace.

**When to hand in**

By 10:29 am, Monday, Feb 8, 2021