CS 5000 – Summer 2023
Assignment #5, 50 Points

Methods – Chapter 6

Develop a complete Java program for each of the following problems. Please name the methods and programs as indicated below and add proper program headers and output labels as specified. Each program includes a *main* method and other method(s) as specified in the problem statement. Notice that the *main* method is used mainly to test the other specified method(s). ***Please use only concepts and programming constructs/syntax we discuss to date.***

Make sure you **include a header for each program (see previous assignments).**

Program #1 (25 points): Write a Java program, named ***`Password`***. In the program, design and implement a **method** (named **`CheckPassword`**) that takes a **string** password as a parameter, determines whether the password is valid or invalid using the following rules. The method then returns the outcome as a boolean value (true or false).

The rules are:

- Password must include at least 9 characters
- Password contains only letters and digits
- Password must include at least 3 digits
- Password must include at least 3 lower-case letters
- Password must include at least 3 upper-case letters

Develop five additional boolean methods, one for each stated rule above, to check if that rule is met or not. A password is valid if all five methods return true values, otherwise the password is invalid. Design the program main method such that it allows the user to re-run the program with different inputs (as we did in the previous assignment using a sentinel loop structure). Document your code and organize the outputs properly using escape characters. In the main method, ask the user to enter a password and then display the judgement "Valid Password" or "Invalid Password". Sample test data below show both input prompts and output labels. Make sure your code displays the outputs following the test data format.

First test:
```
Enter a password: CS5000/01
Entered password:   CS5000/01
Judgment:           Invalid Password
```

Second test:
```
Enter a password: CS5000Section01
Entered password:   CS5000Section01
Judgment:           Valid Password
```

Third test:
```
Enter a password: MyOldK9Dog
Entered password:   MyOldK9Dog
Judgment:           Invalid Password
```

Fourth test:
```
Enter a password: ABCabc123
Entered password:   ABCabc123
Judgment:           Valid Password
```

Program #2 (25 points): The international standard letter/number mapping for telephones is as follows:

number 2 maps to letters a,b,c	number 3 maps to letters d,e,f
number 4 maps to letters g,h,i	number 5 maps to letters j,k,l
number 6 maps to letters m,n,o	number 7 maps to letters p,q,r,s
number 8 maps to letters t,u,v	number 9 maps to letters w,x,y,z

Design and implement a Java program, named ***KeyPad***, that defines the following method:

Method `getNumber(…)` takes one uppercase letter as a parameter and returns the corresponding integer number according to the above mapping (**`int getNumber (char uppercaseLetter`**)).

Hint: To reduce coding, use either uppercase or lowercase letters by converting user input to either case before processing the input.

The main method askes the user to enter a phone number (**as a string value**) with letters, uses method `getNumber()` to convert the letters into digits, and finally prints out the phone number in digits. Design the main method such that it allows the user to re-run the program with different inputs (as we did in the previous assignments using a sentinel loop structure). Document your code and organize the outputs properly using escape characters as shown below. Sample tests below show both input prompts and outputs. Make sure your code displays the outputs following the test data format.

First test:

```
Enter phone number: 1-800-GMCARS7
You entered:      1-800-GMCARS7
Phone Number:     1-800-4622777
```

Second test:

```
Enter phone number: 770-KSU-CCSE
You entered:      770-KSU-CCSE
Phone Number:     770-578-2273
```

Third test:

```
Enter phone number: 770-ksuccse
You entered:      770-ksuccse
Phone Number:     770-5782273
```

Fourth test:

```
Enter phone number: (770) KSU-CCSE
You entered:      (770) KSU-CCSE
Phone Number:     (770) 578-2273
```

Submission:

1. Before submitting your programs, make sure you review the assignment submission requirements and grading guidelines posted in D2L. The grading guidelines explain some of the common errors found in programming assignments.
2. The assignment due date is posted in D2L.
3. Please run and compile your java files (only the .java files) right before you upload to the assignment submission folder in D2L.