BITS, Pilani – KK Birla Goa Campus
Department of CS&IS

CS/IS F213 Object Oriented Programming
CS/IS C313 Object Oriented Programming and Design

Lab-3 *Dt.20.08.2014*

The pre-lab work for the lab is as follows.

1. Read **Ch13, 15, 19** from *The Java Programming Language, Ken Arnold, James Gosling and David Holmes, 4th Edition / 3rd Edition*.
2. Read the regular expressions summary uploaded onto the course site.

The in-lab work for first lab is as follows.

Question-1

Part-A

You are an eminent Physicist who is on the verge of proving the existence of wormholes. The only bottleneck in the process is that you have to add very very big numbers.
These numbers exceed the traditional limits of long or double.
You know that all the huge numbers are definitely non-negative (>=0).
To solve this problem you consult your college professor and he suggest you to store the numbers as strings and then add them.
You are required to create an object HugeInt which stores the huge number as string and allows its addition to another HugeInt.
The first line of input contains N>=1 followed by N lines. Each line contains two string representations of numbers separated by space. You need to output the sum of the two numbers in each line.

SAMPLE INPUT:

```
3
1235 78954
0 9568
497987965 13544
```

SAMPLE OUTPUT:

```
80189
9568
498001509
```

Part-B

Having done this, now add the functionality to compare two HugeInt. The result of comparison can be one of the following:

- num1.compare(num2) -> -1 if num1<num2
- num1.compare(num2) -> 1 if num2<num1
- num1.compare(num2) -> 0 if num1=num2

Question-2

Define a class **Agency** with the following parameters:
Agency Name, Agency Address, Agency Phone Number, Agency TIN Number(Tax-Payer Identification Number) and Agency PAN Number(Personal Account Number)

The parameters are restricted to have only certain possible values:
Agency Name: String

Agency Address: String

Phone Number: Format of the phone number is : <Country Code><STD Code><Phone Number>

Country code has to begin with '+' followed by 2 digits.
Eg: +91 STD Code: 4 Digits Phone Number: 8 digits

TIN Number: Format of TIN number is: <2 letters a-z A-Z><space><7 digits>

PAN Number: Format of PAN number is : <4 letters a-z A-Z><5 digits><2 letters a-z A-Z>

Define two constructors for this class: one that accepts Name and Address as the parameters and assigns other parameters to any constant non-null value and the other that accepts all the parameters.
Define the following methods:

a) A method that accepts name and address as the parameters from the keyboard and checks whether an agency of that object exists or not. If yes then print *True*, else create an agency object with that parameters.

b) A method that accepts a number with 5 digits and checks whether an agency with PAN number having that 5 digit exists or not.

Create javadoc for this program.

The post-lab work for first lab is given below. (to be check in next lab)

Question-3

There has been an alien invasion from the residents of Planet Avaj. They have planted multiple Antimatter bombs and they will all detonate unless any one of them is defused using a password.

You as a super awesome hacker have been able to extract some hints about the password and a huge list of passwords. Due to some strange coincidence, you see that the alien languages contain all the standard ASCII characters. You have to shortlist the probable passwords based on the following rules and check if it fits.

You are need to implement the main and any other method body you consider necessary in the provided **AlienInvasion.java** file. The final computed password must be passed to defuse(String) method to check the result.

PASSWORD RULES:

1. The password must be at least 20 character long
2. the password must contain a digit (0-9)
3. the digit must be preceded by some non-numeric character
4. the end of the password must be a date of format
   DD/MM/YYYY HH:MM

yes there is a space in between and all the digits must be present. Digits occurring in this part of the password are not considered as satisfiability condition of rule 2.

5. If there is a $ sign before the first numeric digit occurs, the password is invalid

You need to redirect the provided input file into the program and then check if you can save the world.
The passwords are given in the file **password.txt**.

References:
Immutable arbitrary precision integer class is available in Java as BigInteger
http://docs.oracle.com/javase/7/docs/api/java/math/BigInteger.html

Reading input into a Java program through **Scanner** class
http://docs.oracle.com/javase/7/docs/api/java/util/Scanner.html
http://stackoverflow.com/questions/11871520/how-could-i-read-input-from-the-console-using-the-scanner-class

Java Regular Expressions Package
http://docs.oracle.com/javase/7/docs/api/java/util/regex/package-summary.html

Summary of Regular Expressions Patterns
http://docs.oracle.com/javase/7/docs/api/java/util/regex/Pattern.html

A tutorial on RegEx
http://www.vogella.com/tutorials/JavaRegularExpressions/article.html