CS103-Lab 10

1) (Short Circuit Evaluation, De Morgan's law, returning Boolean type from a method) Write a java program that reads three sub grades for a student (midterm out of (30), final out of (50), project out of (20)) in a course. The student passes the course if he gets more than 50% in EACH sub grade. Write a methods isPass() to check if the student passes the course or not. The method shall return "true" ~~is~~ if student passes the course, otherwise it shall return "false".

   Now, use De Morgan's low and write another method isFail() to check if the student does not pass the course. Show your work to TA/instructor and explain how short circuit evaluation works in your code.

   The output of both methods is shown below:

```
//Example Run1:

Enter mid term grade:
12
Enter final grade:
18
Enter project grade:
32

Has the student passed the course?
No, the student failed!

Has the student failed the course?
Yes, the student failed!



//Example Run2:

Enter mid term grade:
20
Enter final grade:
30
Enter project grade:
15

Has the student passed the course?
Yes, the student passed!

Has the student failed the course?
No, the student passed!
```

2) (Returning Boolean type from a method) Write a java program that ask the user to enter a number (N) then the program checks if the number is perfect and divisible by 3. A perfect number is one that equals the sum of its positive divisors excluding itself. You should use two methods: first method named **isPerfect()** to check if the number is perfect or not, second method named **isDivisibleBy3()** to check that the number is divisible by 3. The four possible outputs of the program are as follows:

```
Please enter a number:
28
28 is a perfect number but not divisible by 3.

Please enter a number:
6
6 is a perfect number and divisible by 3.

Please enter a number:
12
12 is not perfect number but it is divisible by 3.

Please enter a number:
29
29 is not a perfect number and not divisible by 3.
```

3) (Reading a predefined amount of data from a file) Write a java program that reads grades of first 10 students from a file (grades.txt, although the file contains grades of 15 students in total, separated by whites space) and calculates the average grade for 10 students. (copy file grades.txt to the directory of your java project). Add throws clause to avoid exception when the file does not exit. Deletes file (grades.txt) from project folder and run the program what is the output?

4) (Reading an entire file) Modify you program in question 3 such that it reads all grades from the file "grades.txt" and calculates average grade of all students.

Add a couple of more grades in the text file and check if your program works for any number of students.