BOĞAZİÇİ UNIVERSITY — Department of Industrial Engineering

Course Code : IE 310
Course Title : Operations Research
Semester : Fall 2016
Lecturer : Asst. Prof. Dr. Hakan Yaşarcan
Teaching Assitants: Ahmet Çağrı Düzgün, B.Sc.; Elif Konyar (3rd year student)

Assignment 2
Due Date : 23 October 2016
Due Time : 23:59

In this assignment, you will write a JAVA code that accomplishes the following tasks:

1. Read the values given in a text file named "input.txt". Note that, the values will be given in the format of the following example:

```
n (# of all variables; # of columns in matrix A):
5

m (# of constraints excluding the sign restrictions; # of rows in matrix A):
3

vector c transpose (objective function coefficients):
1 4 0 0 0

matrix A (technological coefficients):
2 10 1 0 0
3 40 0 1 0
0.5 20 0 0 1

vector b (right-hand side coefficients):
100
200
80
```

2. Assume that the problem is given in its standard form. Thus, we only have equalities as the main constraints and all variables are non-negative. Further assume that our aim is to maximize the objective function value. Under these assumptions:

   2.1. Report the initial Simplex Tableau in a text file named "out ini.txt". Your output should look like the following:

```
Row   Z     x1    x2    x3    x4    x5    RHS
-----------------------------------------------
0     1     -1    -4    0     0     0     0
-----------------------------------------------
1     0     2     10    1     0     0     100
2     0     3     40    0     1     0     200
3     0     0.5   20    0     0     1     80
-----------------------------------------------
```

   2.2. Use the **Revised-Simplex Method** to obtain a solution report it in a text file named "out opt.txt". Output format is the same as the "out ini.txt".

Remarks:
* This assignment depends on the previous assignment. Thus, you can use the code that you submitted for the previous assignment in this assignment too.
* The next assignment will depend on this one. Therefore, we encourage you to do it perfectly.
* Do not code the Simplex Method!!! That's more difficult to do so. You need to code the Revised-Simplex Method.
* Note that, we will use different input files to test your code.
* Do not forget to format your output. The example output file is uploaded to the moodle page of the course.
* The example input file is also uploaded to the moodle page of the course.
* For the platform for your assignments, see the related announcement on the moodle page of the course.
* The Java project folder including your Java code must be uploaded to the moodle page of the course.
* Use only ".zip" format to archive your assignment files. Please do not use other compression methods such as ".rar".
* Example zip file names: Group 5 lacivert.zip; Group 12 oldies but goldies.zip; Group 7 EFI.zip
* Your zip file will include project folder and information.txt
* Project folder is the Eclipse project folder including your Java code.
* You need to write a text file as a part of your assignment. The ".txt" file should contain the following information:
  a. The number and name of the group.
  b. The names, surnames, student IDs, and the contribution percentages of the group members.