OR LAB Assignment 3

Nikita 18AE30029

Problem 1)

```
The Simplex tableau:
0 4 -1 -2 1 0 0 0 -3
0 5 3 1 0 1 0 0 4
0 6 1 0 0 0 1 0 2.5
0 7 0 1 0 0 0 1 1.5
Beginning Simplex method!!
Deviations: 7 3 0 0 0 0
leaving_var_row_index: 1, entering_var_col_index: 2
Deviations: 0 0.666667 0 -2.33333 0 0
leaving_var_row_index: 3, entering_var_col_index: 3


Iteration: 2
The Tableau:
0 4 0 0 1 0.333333 0 1.66667 0.833333
7 2 1 0 0 0.333333 0 -0.333333 0.833333
0 6 0 0 0 -0.333333 1 0.333333 1.66667
3 3 0 1 0 0 0 1 1.5
Deviations: 0 0 0 -2.33333 0 -0.666667
Reached the termination state since all deviations are non positive
Number of Iterations to solve the Problem: 2

The Optimisation function is optimised at the point : x3 = 0.833333, x1 = 0.833333, x5 = 1.66667, x2 = 1
.5, Rest all xis=0
The value of the objective function at this point is : 10.3333
```

Problem 2)

```
The Simplex tableau:
0 5 -1 -1 0 1 0 -2
0 6 2 0 1 0 1 5
Beginning Simplex method!!
Deviations: -4 -8 -3 0 0
Reached the termination state since all deviations are non positive
Number of Iterations to solve the Problem: 0

The Optimisation function is optimised at the point : x4 = -2, x5 = 5, Rest all xis=0
The value of the objective function at this point is : 0
```

Problem 3)

```
The Simplex tableau:
0 5 -2 -2 1 1 0 0 -2
0 6 3 -4 0 0 1 0 3
0 7 0 1 3 0 0 1 3
Beginning Simplex method!!
Deviations: 5 -2 3 0 0 0
leaving_var_row_index: 1, entering_var_col_index: 2
Deviations: 0 4.66667 3 0 -1.66667 0
leaving_var_row_index: 2, entering_var_col_index: 3


Iteration: 2
The Tableau:
0 5 0 0 15 1 0.666667 4.66667 14
5 2 1 0 4 0 0.333333 1.33333 5
-2 3 0 1 3 0 0 1 3
Deviations: 0 0 -11 0 -1.66667 -4.66667
Reached the termination state since all deviations are non positive
Number of Iterations to solve the Problem: 2

The Optimisation function is optimised at the point : x4 = 14, x1 = 5, x2 = 3, Rest all xis=0
The value of the objective function at this point is : 19
```

Problem 4)

```
Enter the Iteration:
3
The Simplex tableau:
0 5 5 7 4 1 0 0 7
0 6 4 -7 -5 0 1 0 2
0 7 -3 -4 6 0 0 1 -3
Beginning Simplex method!!
Deviations: 3 2 2 0 0 0
leaving_var_row_index: 1, entering_var_col_index: 2
Deviations: 0 7.25 5.75 0 -0.75 0
leaving_var_row_index: 0, entering_var_col_index: 3
Deviations: 0 0 1.03175 -0.460317 -0.174603 0
leaving_var_row_index: 2, entering_var_col_index: 4


Iteration: 3
The Tableau:
2 3 0 1 0 0.0172745 -0.0806142 -0.0786948 0.195777
3 2 1 0 0 0.119002 0.111324 0.0134357 1.01536
2 4 0 0 1 0.0710173 0.00191939 0.120921 0.138196
Deviations: 0 0 0 -0.533589 -0.176583 -0.12476
Reached the termination state since all deviations are non positive
Number of Iterations to solve the Problem: 3

The Optimisation function is optimised at the point : x2 = 0.195777, x1 = 1.01536, x3 = 0.138196, Rest a
ll xis=0
The value of the objective function at this point is : 3.71401
```

Problem 5)

```
Enter the Iteration:
3
The Simplex tableau:
0 5 -1 1 1 1 0 0 -4
0 6 1 1 2 0 1 0 8
0 7 -1 0 -1 0 0 1 -2
Beginning Simplex method!!
Deviations: 1 2 3 0 0 0
leaving_var_row_index: 0, entering_var_col_index: 4
Deviations: 4 -1 0 -3 0 0
leaving_var_row_index: 1, entering_var_col_index: 2
Deviations: 0 0.333333 0 -0.333333 -1.33333 0
leaving_var_row_index: 0, entering_var_col_index: 3


Iteration: 3
The Tableau:
2 3 0 1 1.5 0.5 0.5 0 2
1 2 1 0 0.5 -0.5 0.5 0 6
0 7 0 0 -0.5 -0.5 0.5 1 4
Deviations: 0 0 -0.5 -0.5 -1.5 0
Reached the termination state since all deviations are non positive
Number of Iterations to solve the Problem: 3

The Optimisation function is optimised at the point : x2 = 2, x1 = 6, x6 = 4, Rest all xis=0
The value of the objective function at this point is : 10
```