

**MP-1 PRACTICAL-4**

1. Demonstrate a python program for special cases in Simplex method

**QUESTION:**

Maximize  $Z=3x_1 + 5x_2$

Subject To:

$$3x_1 + 2x_2 = 18$$

$$x_1 \leq 4$$

$$2x_2 \leq 12$$

$$x_1 \geq 0$$

$$x_2 \geq 0$$

Solve LP using simplex method using Python

**Code:**

```
import numpy as np
```

```
import scipy as sp
```

```
c = [-3, -5]
```

```
A = [[1, 0], [0, 2], [3, 2]]
```

```
b = [4, 12, 18]
```

```
x0_bounds = (0, None)
```

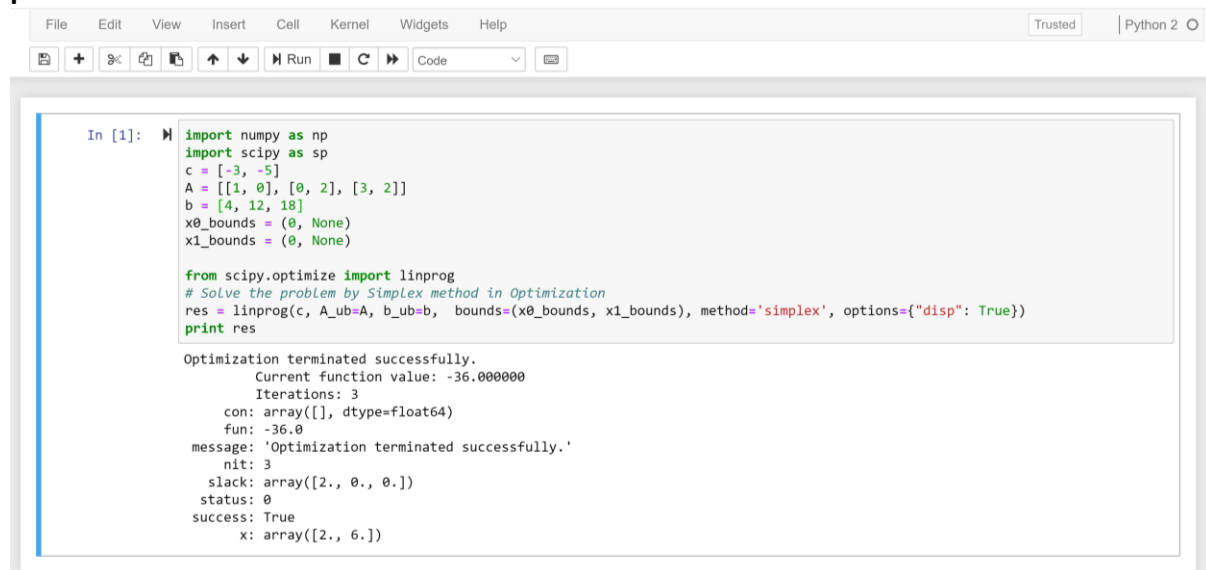
```
x1_bounds = (0, None)
```

```
from scipy.optimize import linprog
```

```
# Solve the problem by Simplex method in Optimization
```

```
res = linprog(c, A_ub=A, b_ub=b, bounds=(x0_bounds, x1_bounds), method='simplex',  
options={"disp": True})
```

```
print res
```



```
In [1]: import numpy as np
import scipy as sp
c = [-3, -5]
A = [[1, 0], [0, 2], [3, 2]]
b = [4, 12, 18]
x0_bounds = (0, None)
x1_bounds = (0, None)

from scipy.optimize import linprog
# Solve the problem by Simplex method in Optimization
res = linprog(c, A_ub=A, b_ub=b, bounds=(x0_bounds, x1_bounds), method='simplex', options={"disp": True})
print res

Optimization terminated successfully.
  Current function value: -36.000000
    Iterations: 3
   con: array([], dtype=float64)
   fun: -36.0
message: 'Optimization terminated successfully.'
   nit: 3
slack: array([2., 0., 0.])
status: 0
success: True
   x: array([2., 6.])
```