# Assignment 3
Linear Programming

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I. PROBLEM

Minimise and Maximise $Z = x + 2y$ subject to $x + 2y \geq 100$; $2x - y \leq 0$; $2x + y \leq 200$; $x, y \leq 0$.

II. SOLUTION

In order to obtain the maximum and minimum value we need to solve the system of inequalities. By plotting the graph of the equations, the common area is obtained. The corners that define the region are A(0,50) ; B(20,40) ; C(50,100) and D(0,200).

```
Minimum =   175.0
Maximum =   400.0
<matplotlib.legend.Legend at 0x7fded4ce9b70>
```
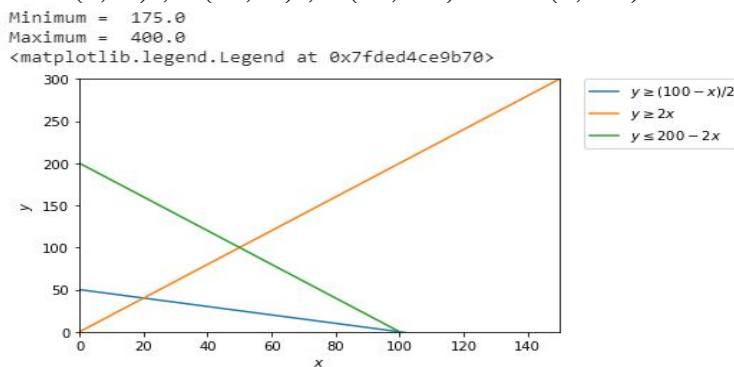

Solving for Z a these points we get

$$Z = x + 2y \quad (1)$$

$$Maximum Z = 400; Minimum Z = 100 \quad (2)$$

The above set of linear programming can be solved by using PulP in python which is a Linear Programming modeler. This optimization module returns the same values of maximum and minimum as obtained from the classical computation. The following python code generates the equation of circle

Link : https://github.com/Swati-Mohanty/EE5600/tree/master/Assignment