Assignment-6

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Download all python codes from

```
https://github.com/mirhasidheek7213/
    InternshipIITH/blob/main/Assignment−6/codes
```

and latex-tikz codes from

```
https://github.com/mirhasidheek7213/
    InternshipIITH/blob/main/Assignment−6/
    Assignment6.tex
```

1 OPTIMIZATION 2.11

Maximise $Z = x + y$, subject to the constraints: $x - y \leq -1$, $-x + y \leq 0$, $x, y \geq 0$.

2 SOLUTION

This can be solved in Python which generates the result as shown in the Figure.

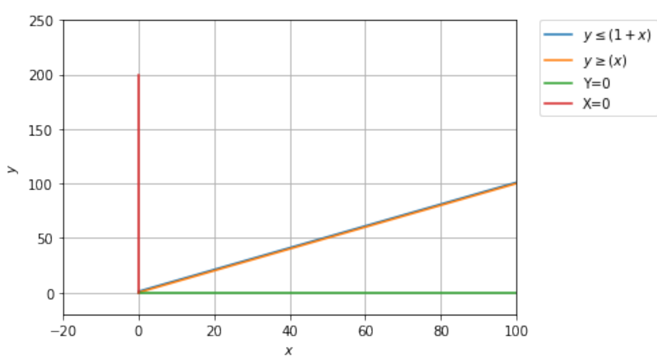

Fig. 1: Plot from python code

The given problem can be expressed in general as matrix inequality as:

$$\max_{\{x\}} \mathbf{c}^T \mathbf{x} \tag{2.0.1}$$

$$s.t \quad \mathbf{A}\mathbf{x} \leq \mathbf{b} \tag{2.0.2}$$

$$\mathbf{x} \geq 0 \tag{2.0.3}$$

$$\mathbf{y} \geq 0 \tag{2.0.4}$$

where,

$$\mathbf{c} = \begin{pmatrix} 1 \\ 1 \end{pmatrix} \tag{2.0.5}$$

$$\mathbf{A} = \begin{pmatrix} 1 & -1 \\ -1 & 1 \end{pmatrix} \tag{2.0.6}$$

$$\mathbf{b} = \begin{pmatrix} -1 \\ 0 \end{pmatrix} \tag{2.0.7}$$

Solving for Z by this reduction method we get

$$MaxZ = None \tag{2.0.8}$$

There is no optimal maximum solution for this.