Optimization

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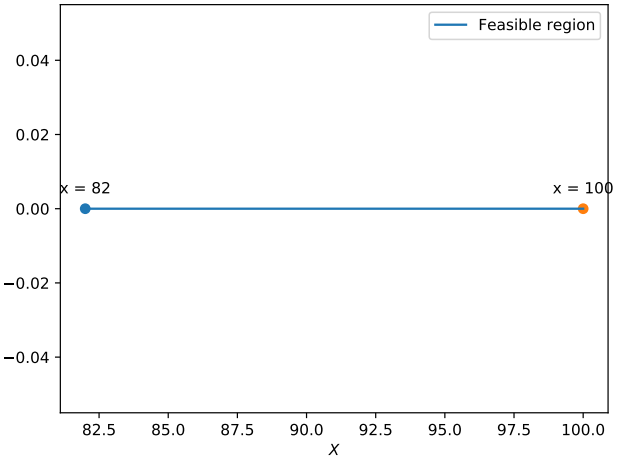
Problem Statement **- To receive Grade 'A' in a course,one must obtain an average of 90 marks or more in 5 examinations. If sunita's marks in first four tests are 87,92,94and 95. find the minimum marks that sunita must obtain to get grade A in the course.**

Solution

Let x be the marks need to be scored by sunita in the fifth test.



$$P = \min_{x} x \tag{1}$$

$$x + 368 \geq 450 \tag{2}$$

$$100 - x \geq 0 \tag{3}$$

$$\tag{4}$$

which can be expressed in vector form as

$$P = \min_{\mathbf{x}} \mathbf{x} \tag{5}$$

$$\begin{pmatrix} 1 \\ -1 \end{pmatrix} \mathbf{x} + \begin{pmatrix} 368 \\ 100 \end{pmatrix} \succeq \begin{pmatrix} 0 \\ 0 \end{pmatrix} \tag{6}$$

Solving using cvxpy, we get

$$P_{min} = 82 \tag{7}$$

$$\mathbf{x} = 82 \tag{8}$$

$$\tag{9}$$