



# Assignment - Vector

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## III. CODE LINK

<https://github.com/sssurajit/fwc/blob/main/vector/codes/vector.py>

Execute the code by using the command  
**python3 vector.py**

## IV. FIGURE

### I. PROBLEM

Find the distance between the point(0,0) and (36,15). Can you now find the distance between the two towns A and B discussed in Section 7.2

### II. SOLUTION

The distance between the points A and B is given

$$\mathbf{A} = \begin{pmatrix} 0 & 0 \end{pmatrix}$$

$$\mathbf{B} = \begin{pmatrix} 36 & 15 \end{pmatrix}$$

$$\|\mathbf{A} - \mathbf{B}\|$$

where

$$\mathbf{A} - \mathbf{B} = \begin{pmatrix} -36 \\ -15 \end{pmatrix}$$

$$d = \sqrt{(\mathbf{A} - \mathbf{B})^T (\mathbf{A} - \mathbf{B})}$$

$$d = \sqrt{\begin{pmatrix} -36 \\ -15 \end{pmatrix} \begin{pmatrix} -36 & -15 \end{pmatrix}}$$

$$d = \sqrt{1296 + 225}$$

$$d = \sqrt{1521}$$

$$d = 39$$

