Subject: Computer Graphics

Topic: Geometrical Transformation

Basic Transformation

- **Transformation** means changing some **graphics** into something else by applying rules.
- We can have various types of **transformations** such as translation, scaling up or down, rotation, shearing, etc. When a **transformation** takes place on a 2D plane, it is called 2D **transformation**.
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Basic Transformation

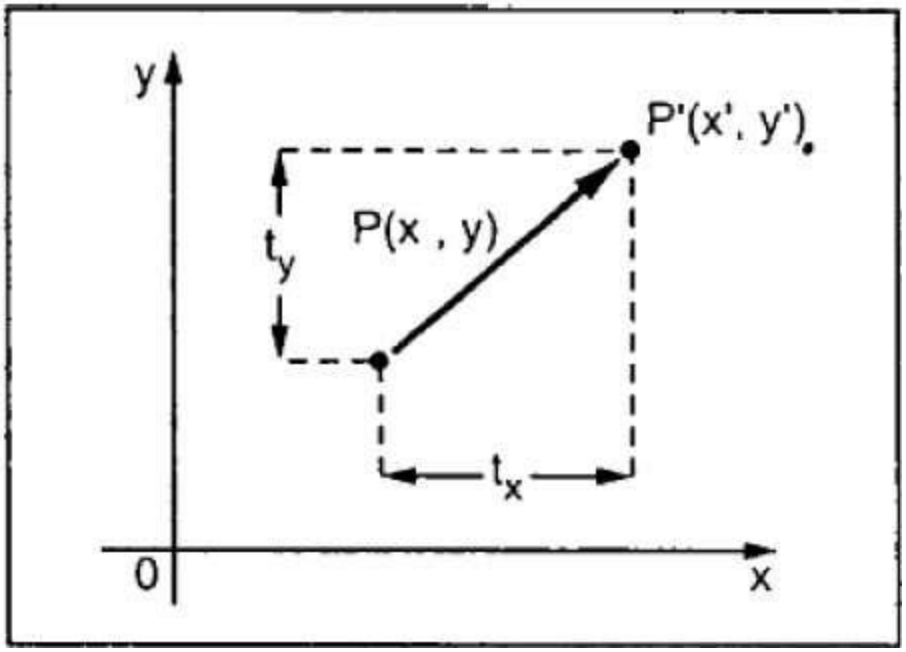
- In **Computer graphics**, **Transformation** is a process of modifying and re-positioning the existing **graphics**.
- 2D **Transformations** take place in a two dimensional plane. **Transformations** are helpful in changing the position, size, orientation, shape etc of the object.

2D Translation

- In **Computer graphics**, **2D Translation** is a process of moving an object from one position to another in a two dimensional plane. Consider a point object O has to be moved from one position to another in a **2D** plane.
- A translation moves an object to a different position on the screen.

Translation

- You can translate a point in 2D by adding translation coordinate (t_x, t_y) to the original coordinate X,YX,Y to get the new coordinate X′,Y′



Translation

- From the above figure, you can write that −
- **$X' = X + t_x$**
- **$Y' = Y + t_y$**
- The pair (t_x, t_y) is called the translation vector or shift vector. The above equations can also be represented using the column vectors.

- P=[X]/[Y]P
- p' = [X′]/[Y′]
- T = [tx]/[ty]
- **$P' = P + T$**
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