RAMA UNIVERSITY

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FACULTY OF ENGINEERING & TECHNOLOGY

BCS -504 Computer Graphics & Multimedia

Lecture-10

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OUTLINE

- Scaling

Scaling

It is used to alter or change the size of objects. The change is done using scaling factors. There are two scaling factors, i.e. S_x in x direction S_y in y-direction. If the original position is x and y. Scaling factors are S_x and S_y then the value of coordinates after scaling will be x^1 and y_1.

If the picture to be enlarged to twice its original size then $S_x = S_y = 2$. If $S_x$and S_y are not equal then scaling will occur but it will elongate or distort the picture.

If scaling factors are less than one, then the size of the object will be reduced. If scaling factors are higher than one, then the size of the object will be enlarged.

Scaling

If S_x and S_y are equal it is also called as Uniform Scaling. If not equal then called as Differential Scaling.

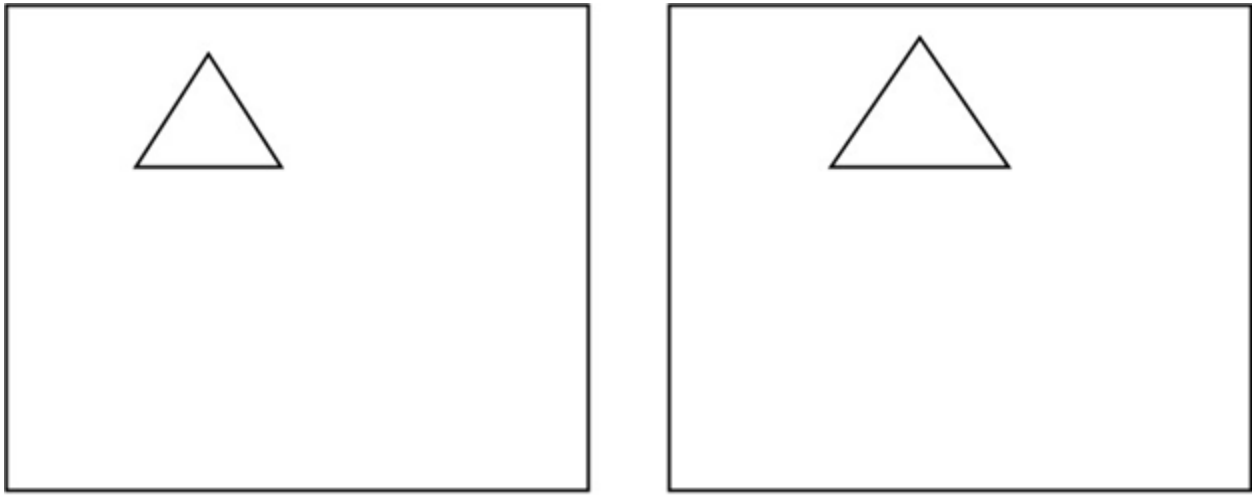
If scaling factors with values less than one will move the object closer to coordinate origin, while a value higher than one will move coordinate position farther from origin.

Enlargement: If T_1=,If (x_1 y_1)is original position and $T_1$is translation vector then (x_2 y_2) are coordinated after scaling

$$[x_2 y_2] = [\ x_1 y_1] \begin{bmatrix} 2 & 0 \\ 0 & 2 \end{bmatrix} = [2x_1 2y_1]$$

Scaling

The image will be enlarged two times



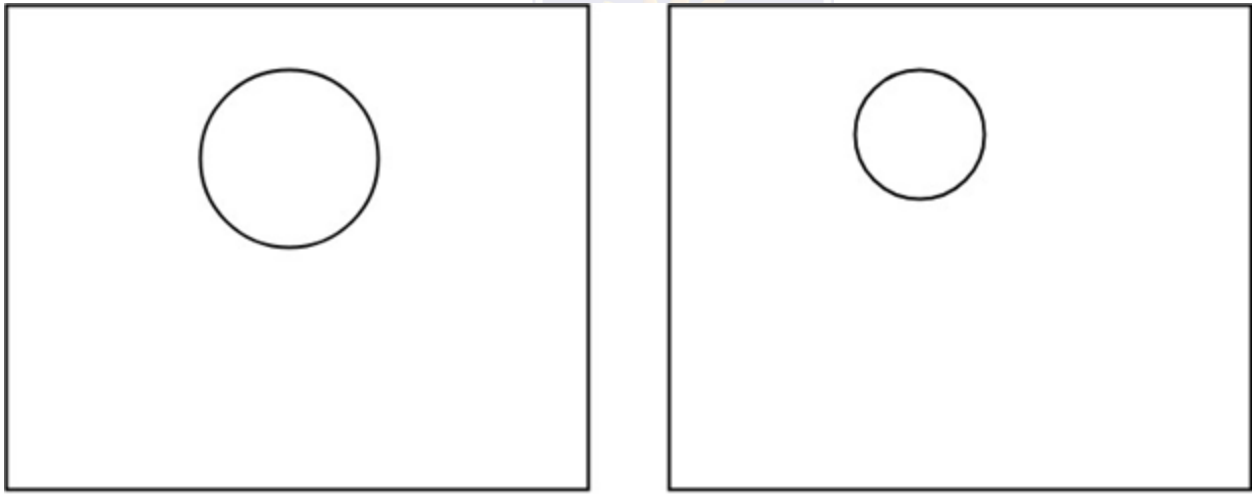
Original Image

Enlarged Image

Scaling

Reduction: If T_1=. If (x_1 y_1) is original position and T_1 is translation vector, then (x_2 y_2) are coordinates after scaling

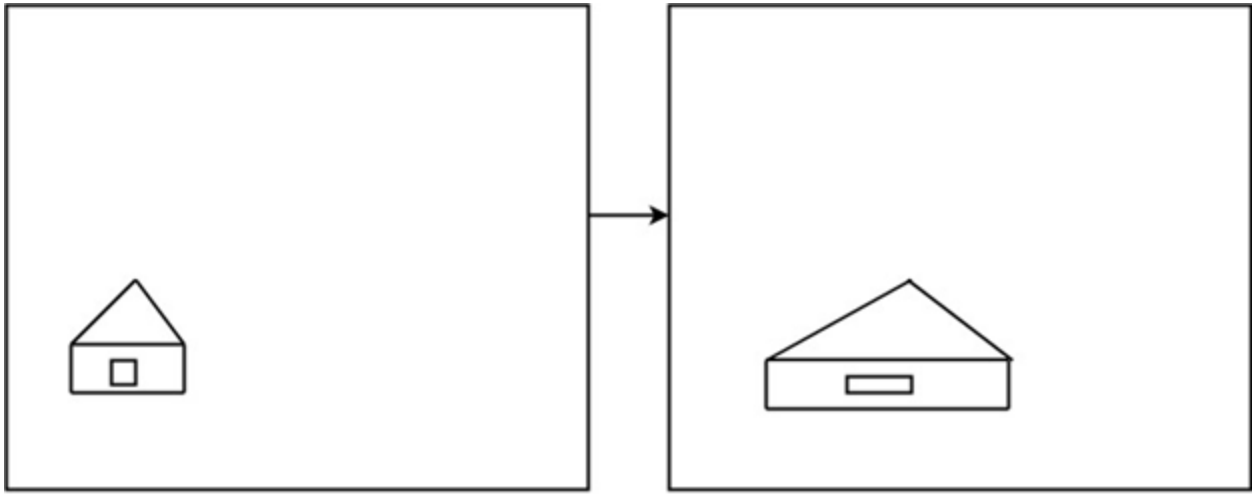
$$[x_2 y_2] = [\ x_1 y_1] \begin{bmatrix} 0.5 & 0 \\ 0 & 0.5 \end{bmatrix} = [.5x_1 . 5y_1]$$



Original Image

Reduction Image

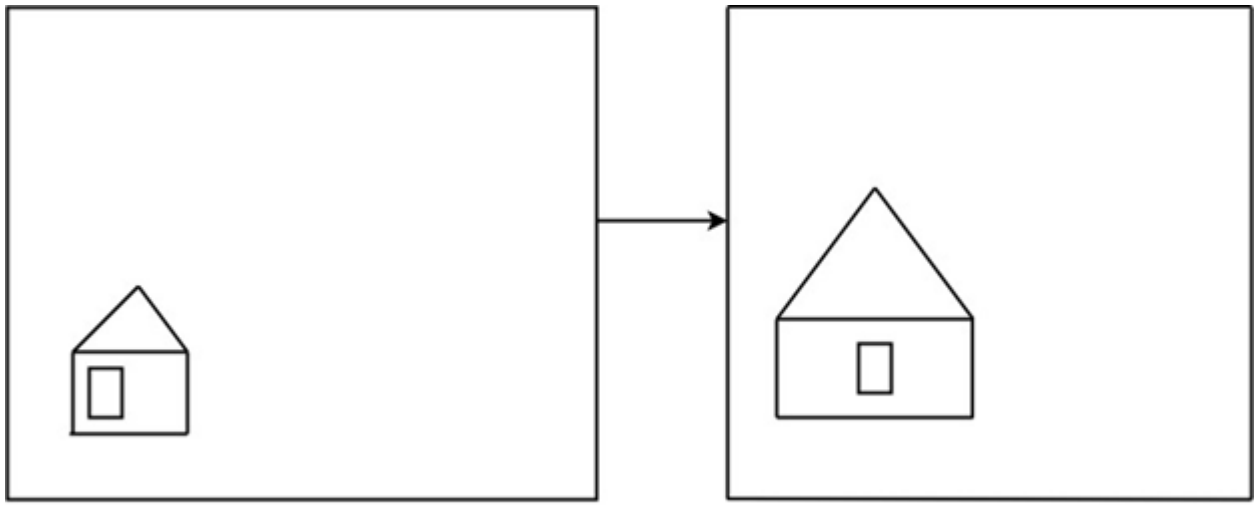
Scaling



Original Object

Object after scaling in X direction

Scaling



Original Object

Object after scaling in Y direction

Multiple Choice Question

MUTIPLE CHOICE QUESTIONS:

Sr no	Question	Option A	Option B	OptionC	OptionD
1	In display a matrix of multi-color light emitting diode is arranged to form the……... position in the display	pixel	point	pivot	lines
2	Which technique is used with random scan monitors?	shadow mask technique	Beam-penetration technique	The beam acceleration	none
3	The beam acceleration voltage controls the …….. and hence color of pixel.	speed of the transistor	speed of the electrons	both	speed of the emmitter
4	Who is a low cost technique to produce color in random scan monitors?	shadow mask technique	morphing	The beam acceleration	None
5	How many display color of beam acceleration can display only four colors.	5	4	3	2

REFERENCES

- http://www.engppt.com/search/label/Computer%20Graphics