

Computer Graphics Lab Sheets

These lab sheets will guide you to prepare for programming and submission of lab reports. You have to submit lab report of previous lab into corresponding next lab. Your lab report to be submitted should include the following topics.

1. *Cover page*
2. *Title*
3. *Objective(s)*
4. *Related Theory*
5. *Algorithm*
6. *Source Code*
8. *Output/Snapshot*
9. *Discussion & Conclusion.*

NOTE: Lab report should be Hand-written (not printed form).

Lab Task 1

Objective: To be familiar with DDA Line drawing algorithm.

WAP to implement DDA algorithm to draw the following AB Lines:

- a) A (100,100) and B (200,250)
- b) A (300,100) and B (100,250)
- c) A (300,400) and B (100,250)

Lab Task 2

Objective: To be familiar with Bresenham's Line drawing algorithm.

WAP to implement Bresenham's algorithm to draw the following AB Lines:

- a) A (150,100) and B (250,250)
- b) A (300,150) and B (150,250)
- c) A (300,200) and B (100,50)

Lab Task 3

Objective: To be familiar with Mid-point Circle drawing algorithm.

WAP to implement Mid-point Circle drawing algorithm to draw circle and Make a Cone form the combination of circles.

- a) Radius=100 and Center (200,125)

Lab Task 4

Objective: To be familiar with Mid-point Ellipse drawing algorithm.

WAP to implement Mid-point Ellipse drawing algorithm to draw ellipse:

- a) Radius-x=100, Radius-y=75 and Center (200,125)
- b) Radius-x=160, Radius-y=250 and Center (300,300)

Lab Task 5

Objective: To be familiar with Basic Transformation.

WAP to implement Basic transformation of a triangle ABC with coordinates A (60,60), B (110,60) and (70,100):

- 1) Translation with translation vector $tx=40$ and $ty=-20$.
- 2) Scaling with scaling factor $sx=2$ and $sy=2$.
- 3) Rotation about y-axis by 45 degree in CC-direction.

Lab Task 6

Objective: To be familiar with Fixed point scaling and Pivot point rotation.

WAP to implement Fixed point scaling and Pivot point rotation of a triangle ABC with coordinates A (60,60), B (110,60) and (70,100):

- 1) Scale about the centroid with scaling factor $sx=2$ and $sy=2$.
- 2) Scale about the centroid with scaling factor $sx=1/2$ and $sy=1/2$.
- 3) Rotation about the centroid by 90 degree in CC-direction.
- 4) Rotation about the centroid by 180 degree in clockwise-direction.

Lab Task 7

Objective: To be familiar with Shear.

WAP to implement Shear of a square ABCD whose coordinates are A (0,0), B (0,100), C (100,100) and D (100,0).

- 1) Shear the square relative to the $X_{ref}=-10$ and $Shy = 2$. Calculate the final coordinates and draw it.
- 2) Shear the square relative to the $Y_{ref}=-10$ and $Shx = 1$. Calculate the final coordinates and draw it.

Lab Task 8, 9, and 10

Objective: To be familiar with OpenGL commands.

Students need to write the code to draw the 3D alphabet and digit as per roll number assigned. Perform the 3D rotations along X, Y and Z-axis respectively and Scaling with different scale factors.

<i>Roll Number</i>	<i>Alphabet</i>	<i>Roll Number</i>	<i>Alphabet</i>	<i>Roll Number</i>	<i>Alphabet</i>	<i>Roll Number</i>	<i>Alphabet</i>
1 & 2	A	17	I	29 & 30	Q	40 & 41	Y
3 & 4	B	18	J	29 & 30	R	42 & 43	Z
5 & 6	C	19 & 20	K	31 & 32	S	44 & 45	2
7 & 8	D	21	L	33	T	46 & 47	3
9 & 10	E	22 & 23	M	34 & 35	U	48	4
11 & 12	F	24	N	36	V		
13 & 14	G	25 & 26	O	37 & 38	W		
15 & 16	H	27 & 28	P	39	X		

*****THE END*****BEST OF LUCK*****

Go to this Link for Graphics in Dev C++:

https://www.youtube.com/watch?v=TEMhWt9WwTA&ab_channel=Reecry

Linker: -lbgi, -lgdi32, -lcomdlg32, -luuid, -loleaut32, -lole32

Install and Configure OpenGL GLUT / freeGLUT on Dev-C ++:

https://www.youtube.com/watch?v=q6ruR7pL_LA

Linker: -lopengl32, -lfreeglut, -lglu32