



Northern University Bangladesh



Clearance for Assessment

Student ID.: 04180301281

Semester: Fall 2021

Student Name: Raiyan Bin Noor

Enrolled Semester: 10

Program: Bachelor of Science in Computer Science and Engineering (CSE)

Course Code	Course Title	Credit Hour	Section	Remarks
CSE 3124	Microprocessor and Assembly Language Programming	3.0	A	
CSE 3171	Microprocessor and Assembly Language Programming Lab Work	1.0	A	
CSE 4278	Computer Graphics and Multimedia System Design	3.0	B	
CSE 4288	Computer Graphics Lab work	1.0	C	
CSE 4351	Image Processing and Computer Vision	3.0	A	
CSE 4355	Artificial Intelligence and Expert System	3.0	B	
CSE 4383	Image Processing and Computer Vision Lab Work	1.0	A	
CSE 4385	Artificial Intelligence and Expert System Lab Work	1.0	B	

Valid for Mid Term Assessment, Fall 2021

Ans. to the ques no. 1 a)

- i) False. C.A: 10 to 60 ms
- ii) True. stored in frame buffer which is also called bitmap
- iii) True. adjusting pixel intensities along the line path leads to remedy
- iv) True.
- v) False. Circle has 8-symmetry, but ellipse has symmetry between quadrants.
- vi) False. They are non-commutative.
- vii) False. They are non-commutative, as the resultant point won't be same.
- viii) Computationally same though mid point line is based on $|m| < 1$
- ix) True
- x) Agreed. True. It will become circle.

Ans. to the ques. no. 2

Here, $n = n_2 - n_1 = (40 - 10) = 30$

$y = y_2 - y_1 = (45 - 15) = 30$

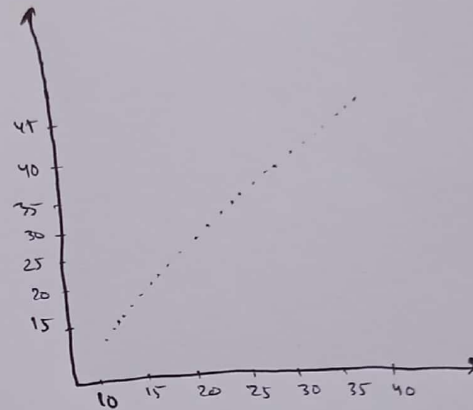
$\therefore m = \frac{\Delta y}{\Delta n} = \frac{30}{30} = 1$

$\therefore y = mx + c$

$\therefore c = 5$

x	y
10	15
11	16
12	17
13	18
14	19
15	20
16	21
17	22
18	23
19	24
20	25
21	26
22	27
23	28
24	29
25	30
26	31
27	32
28	33
29	34
30	35
31	36
32	37
33	38
34	39
35	40
36	41
37	42
38	43
39	44
40	45

$$y = 10 + 5 = 15$$



Ellipse:

$$r_u = 7$$

$$r_y = 5$$

$$2r_y^2 u = 0$$

$$[2r_y^2 = 50]$$

$$2r_u^v y = 2r_u^v r_y$$

$$[2r_u^v = 0.8]$$

Region 1:

$$(u_0, y_0) = (0, 5)$$

$$p_0 = r_y^2 - r_u^v r_y + \frac{1}{4} r_u^v = 25 - 24.5 + 12.25 = -207.75$$

i	p_i	u_{i+1}, y_{i+1}	$2r_y^2 u_{i+1}$	$2r_u^v y_{i+1}$
0	-207.75	1 5	50	490
1	-132.75	2 5	100	490
2	-7.75	3 5	150	490
3	$\frac{-322.75}{167.25}$	4 4	200	392
4	-207.75 0.25	5 3	250	294
5 5	-18.75	6 3	300	294

Region 2

$$(u_0, y_0) = (6, 3)$$

$$p_{20} = f_u \left(6 + \frac{1}{2} \cdot 2 \right) = 25(6 + \frac{1}{2})^2 + 49(3 - 1)^2 - 1225$$

$$= 1056.25 + 196 - 1225$$

$$= 27.25$$

i	p_i	u_{i+1}, y_{i+1}	$2r_y^2 u_{i+1}$	$2r_u^v y_{i+1}$
0	-272.5 $\frac{-2047}{4}$	7 2	350	196
1	$\frac{-1235}{4}$ 254.25 $\frac{156.25}{4}$	8 1	400	98
2	$\frac{169}{4}$ 303.25	9 0	450	0

b) Raster graphics means pixel based graphics that we see in digital screen.

c) Perspective projection:

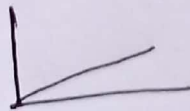
- human visual system
- smaller view of the object for
- angles remain unchanged

parallel projection:

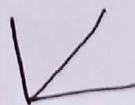
- less realistic
- object shown bigger, ~~into~~
- if the object is moved to some angle.

Ans to the Ques. no 4

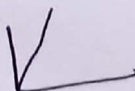
$m = 0$, this tangent has intersection with line
 $m > 1$ algorithm. when $|m| < 1$
 $m < 1$ we find line as



for $m = 1$



for $m > 1$



en1802028)

when $m=1$, the line created without any issue. but when $m < 1$ the line increase by unit in x , but not in y .

Also for $m > 1$, line increase in y by unit but not in x .

so when we get a mid point between two pixel, we have to choose which pixel to burn.

so the condition get changed.

b) For $m=1$, if a midline is drawn, anti aliasing is need because there are

~~jagged~~ jagged staircase visible. this is called raster effect.

then anti aliasing is needed if the intensity of the pixel of the line is I then we set the intensity of the neighbour pixel of the line $I/2$. It will smoothen the line