Assignment: 1 (Unit One)

1. Consider three different raster systems with resolutions of 640 by 400, 1280 by 1024, and 2560 by 2048. What size frame buffer (in bytes) is needed for each of these systems to store 12 bits per pixel? How much storage is required for each system if 24 bits per pixel are to be stored?

2. How long would it take to load a 640 by 480 frame buffer with 12 bits per pixel, if 10^5 bits can be transferred per second? How long would it take to load a 24-bit per pixel frame buffer with a resolution of 1280 by 1024 using this same transfer rate?

3. Consider two raster systems with resolutions of 640 by 480 and 1280 by 1024. How many pixels could be accessed per second in each of these systems by a display controller that refreshes the screen at a rate of 60 frames per second? What is the access time per pixel in each system?

4. Digitize the line with endpoints (2,2) and (10,5) using Bresenham's line drawing algorithm.

5. Digitize the line with endpoints (2,8) and (10,5) using Bresenham's line drawing algorithm.

6. Find the points on a circle of its octants with the circle centered at (5, 5) and has a radius of 8 units.

7. Calculate the required points to plot the following line using Bresenham's algorithm (10,20) and (20,25).

8. Calculate the required points to plot the following line using Bresenham's algorithm (10,20) and (17,30).

9. Calculate the required points to plot the following line using Bresenham's algorithm (20,20) and (10,25).

10. Calculate the required points to plot the following line using Bresenham's algorithm (17,20) and (10,30).

11. Given input ellipse parameters $r_x = 8$ and $r_y = 6$, illustrate the steps in the midpoint ellipse algorithm by determining raster positions along the ellipse path in the first quadrant when the center point (5,5) is given.

Deadline: 28th Mangsir 2080

Note: Students must have to submit assignment report within the deadline.