COMPUTER GRAPHICS & MULTIMEDIA

ETCS-211

TUTORIAL FILE

Computer Science and Engineering

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Tutorial sheet 1

1. Give the use of the following functions:

   initgraph()

   getpixel()

   getmaxcolor()

   getmodename(

)

2. What is the difference between a point and a pixel in graphics?
3. What is the basic block diagram of a computer graphic system? Explain
4. List various compilers that are used for computer graphics.
5. List various languages which are used to make programs in computer graphics.
6. Give the use of the following functions:

   delay()

   line()

Tutorial sheet 2

Q1: Consider a raster system with resolution of 640*480. What size frame buffer is needed to store 12 bits per pixel? How much storage is required if 24 bits per pixel are to be used?

Q2: Compute the size of a 640*480 image at 240 pixels per inch.

Q3: Compute the resolution of a 2"*2" image that has 512*512 pixels.

Q4: If we use direct coding of RGB values per primary colour, how many possible colours do we have?

Q5: Using direct coding of RGB value with 10 bits per primary colour, how many possible colours do we have for each pixel?

Q6: Using 5 bits for red and green each and 6 bits for blue, how many possible colours can be produced?

Q7: If we use 12-bit pixel values in a look up table representation, how many entries does the lookup table have?

Q8: If 2-byte pixel values are used in a 24 bit lookup table representation, how many bytes the look up table occupy?

Q9: Find decision variable and other parameters as found in Bresenham's line drawing algorithm when the line is having slope greater than 1.

Tutorial sheet 3

1. What is the use of DDA line algorithm?
2. Why is bresenham's line algorithm better than DDA line Algorithm?
3. Consider the line from (20,10) to (30,18). Use the bresenham's line algorithm to draw this line.
4. What is scan conversion?
5. Define the following terms:
    i) Bitmap
    ii) Pixmap
    iii) Raster scan
    iv) JPEG
    v) Resolution
    vi) Aspect Ratio

Tutorial sheet 4

Q1: The end points of a line are (0,0)and(6,18).Compute values of pixels in between end points using DDA .

Q2: A line has end points at (3,8) and(7,11) . Determine successive pixels using DDA and Bresenham's line drawing algorithm.

Q3: A line has end points at (9,9) and (14,12).Determine successive pixels using Bresenham's line drawing algorithm.

Q4: A line has end points at (20,9) and (25,13).Determine successive pixels using Bresenham's line drawing algorithm.

Q5: What are the three major adverse side effects of scan conversion?

Q6: For a circle with radius =10 and centre at (0,0),find the pixels on the circle using midpoint circle algorithm.

Q7: For a circle with radius r=5, determine position of pixels along the circle in first quadrant from x=0 to x=y.

Tutorial sheet 5

1. Explain bresenham's circle drawing algorithm.
2. Explain Circle drawing function.
3. Develop bresenham's circle drawing algorithm for drawing a circular arc lying between 00 to 900?
4. Use bresenham's circle drawing algorithm to generate the points for the circle with the centre (10,8) and radius 8.
5. Define the following terms in computer graphics:
    a. Ellipse
    b. Circle
    c. setpixel() function

Tutorial sheet 6

1. Explain the homogenous coordinate system.
2. Translate a polygon with coordinate A(2,5), B(7,10) and C(10,2) by 3 units in x-direction and 4 units in y-direction.
3. Scale the polygon with coordinate A(2,5), B(7,10) and C(10,2) by two units in x-direction and two units in y-direction.
4. Find the transformation matrix for reflection about line y=x.
5. Define the following terms in computer Graphics:
    i) Parallel Projection
    ii) View Plane
    iii) Perspective projection
    iv) Shearing

Tutorial sheet 7

1. Clip the polygon having vertices A(-10,-10), B(-12,-4), C(-8,13), D(12,20), E(7,-7) against rectangle having corner vertices (10,15) and (-9,-3).
2. Explain Cohen-Sutherland clipping algorithm.
3. Differentiate between window and view port.
4. What is reflection?
5. Define the following terms in computer Graphics:
    a. Animation
    b. Bezier Curve
    c. B-spline curve
    d. Clipping

Tutorial sheet 8

Q1: What is a window?

Q2: What is a viewport?

Q3: Coordinates of window are knows as .....

i) Screen coordinates ii) World coordinates iii) Device coordinates iv) Cartesian coordinates

Q4: Coordinates of viewport are known as .....

i) World coordinates ii)Polar coordinates iii) Screen coordinates iv)Cartesian coordinates

Q5: The region against which an object is clipped is called a .....

i) Clip window ii) Boundary iii) Enclosing rectangle iv) Clip square Q6:

What is clipping? Give some applications of clipping.

Q7: What are the advantages of Cohen-Sutherland line clipping algorithm?

Q8: In Cohen-Sutherland line clipping, the region codes of two endpoints of line are1001 and 0101. The line will be

i) totally visible

ii)partially visible iii) trivially invisible

iv) can not be determined

Q9: The diagonal end points of a rectangular clipping window are at (-3,1) & (2,6).Clip the lines

i) AB with end points A(-4,2)&B(-1,7) ii)
CD with end points C(1,-2)&D(3,3) iii)
EF with end points E(-2,2)&F(1,2)