1.Discuss the Bresenham's line generation algorithm with an example

Bresenham's line generation algorithm is a popular and efficient method for drawing straight lines on a pixel grid, such as a computer screen. The algorithm was developed by Jack E. Bresenham in 1965 and is widely used in computer graphics because of its simplicity and speed. It avoids the need for floating-point arithmetic, which can be computationally expensive, by working with integer calculations.

The basic idea behind Bresenham's line algorithm is to determine which pixel to color at each step of the line while minimizing the error. The algorithm starts with two endpoints, (x1, y1) and (x2, y2), and it calculates the coordinates of the pixels to color as it moves from one endpoint to the other, drawing a straight line. It maintains an error term to decide which pixel to color at each step. Bresenham's line generation algorithm is a popular and efficient method for drawing straight lines on a pixel grid, such as a computer screen. The algorithm was developed by Jack E. Bresenham in 1965 and is widely used in computer graphics because of its simplicity and speed. It avoids the need for floating-point arithmetic, which can be computationally expensive, by working with integer calculations.

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2.Discuss the Differential Digital Algorithm (DDA) with an example.

The Differential Digital Algorithm (DDA) is a simple and straightforward method for drawing a digital representation of a straight line segment between two specified endpoints in a 2D plane. It is commonly used in computer graphics for its ease of implementation and efficiency. DDA avoids the need for complex mathematical operations and works directly with integer values, making it suitable for applications where computational resources are limited.

Draw a line from (1,1) to (8,7) using DDA and BLA algorithms.
This case is for slope (m) less than 1. Slope (m) =(7-1)/(8-1) = 6/7 .

S-1: x1=1; y1=1; x2=8; y2=7.

S-2: m=(7-1)/(8-1) = 6/7 which is less than 1.

S-3: As m (6/7) is less than 1 therefore x is increased and y is calculated.

S-4 : The step will be x1=x1+1 and y1= y1+6/7

S-5 : The points genrated would be x1=1+1 and Y1=1+(5/7) => 1+0.9=>1.9=> approx 2. So X 1=2 and Y1= ~2

S.No.	X1	Y1	Pixel Plotted
1	2	2	2,2
2	3	2+6/7 = 2.9	3,3
3	4	2.9 + 6/7 = 3.8	4,4
4	5	3.8 + 6/7 = 4.7	5,5
5	6	4.7 + 6/7 = 5.6	6,6
6	7	5.6 + 6/7 = 7.0	7,7

The algorithm will stop here as the x value has reached 7.

3.Elucidate on any two types of compression techniques with their applications 8 marks

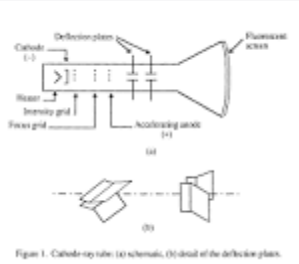
1. **Lossless Compression**:
    - **Description**: Lossless compression is a data compression technique that reduces the size of a file without losing any data. This means that when you compress a file using a lossless compression algorithm, you can decompress it to its original form with no loss of information. Lossless compression is commonly used for data that must be preserved exactly, such as text documents or executable programs.
    - **Applications**:
        - **Text Compression**: Lossless compression is often used for compressing text files. Popular algorithms for text compression include ZIP and GZIP. These algorithms are used to reduce the size of text documents, making them easier to store and transmit.
        - **Archiving and Backup**: Lossless compression is widely used in data archiving and backup solutions. It allows organizations to store large amounts of data efficiently, reducing storage costs and ensuring that data can be restored without any loss.
2. **Lossy Compression**:
    - **Description**: Lossy compression is a technique that reduces the size of a file by discarding some data, resulting in a loss of quality. This means that when you decompress a file compressed using a lossy compression algorithm, you may not get the exact original file. It's commonly used for multimedia data, such as images, audio, and video, where some loss of quality is acceptable to save space.

- **Applications**:
  - **Image Compression**: Lossy compression is widely used in image formats like JPEG (Joint Photographic Experts Group). JPEG is a lossy compression format suitable for photographs and images where some loss of detail is acceptable. It's used in digital cameras, web graphics, and image editing software.
  - **Audio and Video Compression**: Lossy compression is essential for audio and video formats like MP3, AAC, and MPEG. These formats are used for music, streaming video, and multimedia applications, where high compression ratios are needed, and a certain degree of quality loss can be tolerated.

4.What are cathode ray type? Draw its diagram and label it. Provide the advantages and disadvantages of CRT.

Cathode Ray Tube (CRT) is a technology that was commonly used in older computer monitors and television displays. It works by emitting a stream of electrons (cathode rays) that are focused and directed onto a phosphorescent screen to produce images. Here's a simplified diagram of a CRT and an explanation of its components:

Diagram of a Cathode Ray Tube (CRT):



Components and Labels:

1. **Electron Gun**: Emits a stream of electrons.
2. **Cathode**: The negative electrode, which emits the electrons.
3. **Anode**: The positive electrode, which accelerates and focuses the electron beam.
4. **Phosphorescent Screen**: The display surface that emits light when electrons strike it.

Advantages of CRT:

1. **Good Color Reproduction**: CRTs were known for their excellent color reproduction and contrast, making them suitable for tasks like graphic design and video editing.
2. **Fast Response Time**: CRTs have virtually no input lag and a fast response time, making them suitable for fast-moving content, such as gaming.
3. **Wide Viewing Angles**: CRTs had wide viewing angles with consistent image quality from different perspectives.
4. **Excellent Black Levels**: CRTs could display true black, as they emitted light only where electrons struck the screen, which was an advantage in dark scenes.

Disadvantages of CRT:

1. **Size and Weight**: CRTs were bulky and heavy, taking up a lot of space and making them less portable.
2. **Energy Inefficiency**: They consumed a significant amount of power, resulting in higher electricity bills.
3. **Screen Flicker**: Some CRTs exhibited screen flicker, which could cause eyestrain and discomfort.
4. **Susceptible to Screen Burn-In**: Prolonged display of static images could lead to screen burn-in, where ghost images of static content remained on the screen.
5. **Limited Resolution**: CRTs had limitations in terms of maximum resolution and pixel density, which restricted their use for high-definition content.