Unit V

Image and Graphics

5.1 Making still images : Bitmaps, Vector drawing :-

Still images:-

- Still images means a photograph, drawing, painting, shapes and freehand drawing, and single static images.
- In multimedia project, we can require large amount of memory for images like text, symbols, photograph etc.
- Still images divided into two parts in the computers.

1. Bitmap
2. Vector Drawn Graphics

1. Bitmap :-

- A bitmap is a type of memory organization or image file format used to store digital images.
- Images can store in pixel format.
- Bitmap image describes the characteristics of dots(.) individually called as pixel.
- Bitmap implies one bit per pixel.
- Every pixel is either black (0) or white(1).
- Each pixel may store more than two colors.
- Many Graphical User Interfaces use bitmaps in their built-in graphics subsystems.
- Most other images file formats such as JPEG, TIFF, PNG and GIF also store bitmap images.
- Bitmap images are used for simple or complex drawing.
- Bitmap images provide different colors supported by computer, these resolution and color depths are –

Color Depths	Colors
1 bit-map	2 colors
4 bit-maps	16 colors
8 bit-maps	256 colors
16 bit-maps	65536 colors
24 bit-maps	Above 16 million colors

By using bitmap image, we can provide different colors, pixels and we can also provide the resolution.

We can easily create, copy, edit of bitmap image.

A bitmap image provides no. of ways such as –

1) **Clipart :-**
   On the internet and no. of software, we can used cliparts images. These clipart images, we can easily editing.

2) **Bitmap Software :-**
   In windows and MAC O.S we can create or easily editing the bitmap images. These operating systems provide no. of S/W's such as adobe Photoshop, macromedia, window pen etc.

3) **Scanning Images :-**
   Scanning the bitmap images, we can use different scanners.
   Sanners are used to convert text file into digital images.
   For Ex- Flatbed Scanner, 3D Scanners etc.

2. **Vector Drawn Graphics :-**
   - Vector drawn graphics are used for lines, circles, polygons, and graphical shapes that can be mathematically expressed in angles, coordinates and distances.
   - It also filled with colors and pattern.
   - The appearance of both types of images depends upon display resolution your computer.

- There are some software's are provided to designs (CAD - Computer Added Designs) are used for creating highly complex and geometrics images.
- It can be mostly used by engineers.
- Graphic artist (Designer) can be also used for vectors drawn objects. i. e. used for 3D animation to make changes in position, rotation and applying shadow effects.

Vector Images:-

- Vector images are collections of circle, lines, rectangles such type of images is called as Vector Images.
- A vector is a representation of both a quality and direction at the same time.
- It is most commonly used for creating logos, graphics, illustrations and print layouts.
- Such type of images is called as vector images.

- In the above diagram contains circles and some shapes.
- So that we can create an image by using radius, center, width, height and applying different colors by using color tool.

5.2 Colors :-

- Color is important component in multimedia.
- We can apply different colors to the images in project which should be suitable and looks attractive.
- Computer and no. of software's provides different colors for the images.

- The primary color combination is used to provide a new color.
- This primary color combination is known as RGB combination. These are as following –

RGB combination	Display color
Red only	Red
Blue only	Blue
Green only	Green
Red + Green	Yellow
Red + Blue	Magenta
Green + Blue	Cyan White
Red+ Green + Blue	White
None	Black

Color palette :-

- Palette is an mathematical table that define color pixel to display on the screen.
- The following table shows color depths and colors in the palette.

Color Depths	Colors
1 bit-map	2 colors (black & white)
4 bit-maps	16 colors
8 bit-maps	256 colors (enough for color image)
16 bit-maps	65536 colors (excellent)
24 bit-maps	Above 16 million colors (totally photo realistic)

5.3 Image Formats :-

- There are two image formats such as :

1) **Captured Image Format**
2) **Stored Image Format**

1) Captured Image Format :-

- The image format is specified by two parameter's such as :
- **Special resolution** : which specified by as pixel by pixel that is independent pixels.
- **Color encoding:** which is specified by bits per pixel.
- These two parameters depend on hardware and software for input and output of the image.
- For ex - in 320 / 240 of pixels of the color encodes with 1 bit.
- This type of image is known as Binary Image Format.
- Capture an image by using digital camera.

2) Stored Image Format :-

- Images are created by some softwares , are called as Stored Image Format.
- For Ex- Adobe Photoshop, Paint, Corel Draw etc.
- We can store an image, we are storing two dimensional arrays of values each value represent the data about pixels and pixels can contain information about colors, resolution and brightness in the image.

5.4 Graphics Image Format (GIF) :-

- GIF stands for Graphics Image Format.
- It is also bitmap image format.
- We can send GIF file in slow connection because it having very less size.
- It is 8 bit file format.
- It supports only 256 color codes.
- It is used for line drawing, text, logo in simple image.
- Graphics image format are specified by two important parts.
- **Primitives** - The categories of primitives are specified the different shapes such as, circles, lines, rectangles, eclipse and text strings on 2D or 3D object of image.
- **Attributes** - Attributes are specified as, line style line width and color effects on a graphical image.
- This primitives and attributes provide higher levels of an image representation.
- The advantage of high level primitive's reduction of data to be stored of a graphical image and easier manipulation of a graphical image.
- This type of conversion supports the raster graphics.
- A raster graphics package includes bitmap or pixmap.

- A bitmap is an array of pixels on the screen.
- This information as stored in one bit that is binary image format.
- A pixmap is describing multiple bits per pixels.
- Low end color system have 8 bits provides allowing with 256 colors.
- More expensive color systems have 24 bits allowing with above 60 million colors.
- 32 bits per pixels and the screen resolution 1280 * 1024 pixels are available on personal computers.

Advantages :-

1) Small File Size :-

- One of the main advantages of using animated gifs is the size which can be relatively smaller compared with other file formats.
- Moreover, this can be advantageous when loading images online as they can load quicker without losing its quality.

2) **Professional Looking Images :-**

- Aside from the small file sizes when using animated gifs, these types can also support transparent backgrounds.
- This will likewise help in providing a more professional look to a particular website having animation over a varied background.

3. Convey Messages Better :-

- Another pro for animated gifs is that it can show any thought in a much better way than it would normally do.
- It can show movements and emotions that a regular image can't possibly do. More so, this can be perfect when making tutorial animations that can enhance the experience.
- Take note that younger audiences can easily be amused with animations, so it can really make them want to pay attention to details.

Disadvantages :-

1. **Limited Color Pattern:-**
   - The fact that it only uses a color palette of 256 colors, the animated images created can sometimes look poorer in comparison to other image files.
   - For some instances, images can look slightly pixelated or images that can look blocky.

2. **Editing Is Not Possible :-**

- Another con when it comes to using animate gifs is that it can't be edited once the animation has already been coded into the actual gif file. So you need to make sure that you have the final image set before getting it in action right away.
- If you fail to do so, you may have to do the same thing again from the very beginning just to make a minor adjustment to an existing gif file.

3. **Internet Connection Matters :-**

- Despite the fact that gif files are small in size and should run smoothly once the sequence of still images have been finally coded, some of these animated images can be dependent on Internet speed.
- So when the connection lags a bit, the images will not load right away and will end up displaying a less desirable version of that file.
- Take note that animated gifs could be very helpful or could be a liability depending on how they are utilized on the website. So before you desire to use a particular animated gif, try to make sure that you have evaluated the pros and cons as they can work to give your site a boost or otherwise.

5.5 Image File Formats :-

- Image file formats are used to store digital images. Following are some image formats –
  1) JPEG 2) PNG 3) BMP 4) TIFF

1) JPEG :-

- JPEG stands for Joint Photographic Experts Group.
- JPEG file format was developed compress the large bitmap images.
- JPEG files are smaller because less information will be displayed to the images.
- Since, JPEG file is compressed, then lot of loss of pixels but they could not be noticed in photography or real world images.
- JPEG images are always rectangular and have straight edges.
- JPEG files are transported for the internet download too the web browsers. JPEG images use glossy compression method.
- JPEG supports to 26 bits per pixel.
- It produce above 16 lacs colors.
- JPEG format provide high colors, brightness, resolution and quality of a image.

Advantages :-

- JPEG is used or stored digital images on the web.
- JPEG is useful in photographic images.

2) PNG :-

- PNG stands for Portable Network Graphics.
- PNG is also a raster graphics format.
- PNG can support lossless data compression technique.
- PNG can support lossless images compression on the web.
- PNG can support pallet based images of 24 bit or 32 bits.
- PNG is also used to 8 bit color like GIF and 24 bit color like JPEG.
- PNG was designed for transferring the image on the internet, not for professional printing graphics.
- PNG can supported by graphics programs including Adobe Photoshop or Corel Draw.
- If you want to use transparent images then you can use PNG format.

3) BMP :-

- BMP stands for Bitmap Image Format.
- A bitmap is a type of memory organization or image file format used to store digital images.
- Images can store in pixel format.
- Bitmap image describes the characteristics of dots(.) individually called as pixel.
- Bitmap implies one bit per pixel.
- Every pixel is either black (0) or white(1).
- Each pixel may store more than two colors.
- Many Graphical User Interfaces use bitmaps in their built-in graphics subsystems.
- Most other images file formats such as JPEG, TIFF, PNG and GIF also store bitmap images.
- Bitmap images are used for simple or complex drawing.
- It is commonly used for raster graphics formats for saving image files.
- It was introduced on the windows platformbut now because of many other software programs BMP supports both MAC's and PC's.
- It is outdated image format.
- It was developed by Microsoft for storing bitmap files.
- It is uncompressed file format.

4) TIFF :-

- TIFF is stands for Tagged Image File Format.
- TIFF is bitmapped file format developed by Aldos in 1986.
- It is used for professional photography.
- It is lossless data compression because after compression it will maintain the quality and brightness of image as it is.
- TIFF file format size is larger than JPEG.
- It is very common for transporting color or gray-scale images into page layout applications.
- TIFF files can be saved in a variety of color formats and in various forms of compression.

- It use lossless compression to maintain image integrity and clarity used for professional photography.
- TIFF specification defines support for multiple images, so multipage documents can be stored in a single TIFF file at any resolution.
- It also used for publishing and printing.

Question Bank

Q.1 Explain Making Still Images. 5M
Q.2 Explain Image format in detail. 5M
Q.3 Explain Graphics formats in details. 5M
Q.4 Explain the Concept of Colors. 5M

Q.5 Write Short Notes on:
1) JPEG 3 M
2) BMP 3 M
3) TIFF 3 M
4) PNG 3 M