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of

MULTIMEDIA COMPUTING

For

BCA Semester V (CBCS)-UNIT-III

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Unit III

Multimedia Graphics

1. Graphics in Multimedia

Graphics is a term that includes almost everything that exists on the computer and is not sound and text. We can define computer graphics as an art of drawing pictures, lines, charts, figures, etc. using computers with the help of programming languages.

Especially relevant, computer graphics are made up of a number of pixels. As we know that pixels are the smallest graphical picture or unit represented on the computer screen. Furthermore, we can classify computer graphics into two types which are as follows:

Figure 1. Graphics

1.1 Interactive Computer Graphics:

In interactive computer graphics, users have some control over the picture i.e. user can make any changes or alterations in the produced image. One example of it is the ping pong game. At the hardware level, a computer receives input from interaction devices and outputs images to a display device.

The software has three components. The first is the application program, it creates, stores into, and retrieves from the second component, the application model, which represents the graphic primitive to be shown on the screen. The application program also handles user input. It produces views by sending to the third component, the graphics system, a series of graphics output commands that contain both a detailed geometric description of what is to be viewed and the attributes describing how the objects should appear.

1.2 Passive computer Graphics:

Passive computer graphics is an operation on computer graphics that transfers automatically and without operator intervention. Non-interactive computer graphics or passive computer graphics involves one-way communication between the computer and the user. The picture is produced on the monitor and the user does not have any control over the produced picture.

2. Importance of graphics in Multimedia

Graphic design is the most powerful art that has breathed fresh life into digital marketing. Graphics are visual elements often used to point readers and viewers to particular information. They are also used to supplement text in an effort to aid readers in their understanding of a particular concept or make the concept more clear or interesting. In computing, they are used to create a graphical interface for the user; and graphics are one of the five key elements of multimedia technology. Graphics are among the primary ways of advertising the sale of goods or services.

2.1 Business

Graphics are commonly used in business and economics to create financial charts and tables.

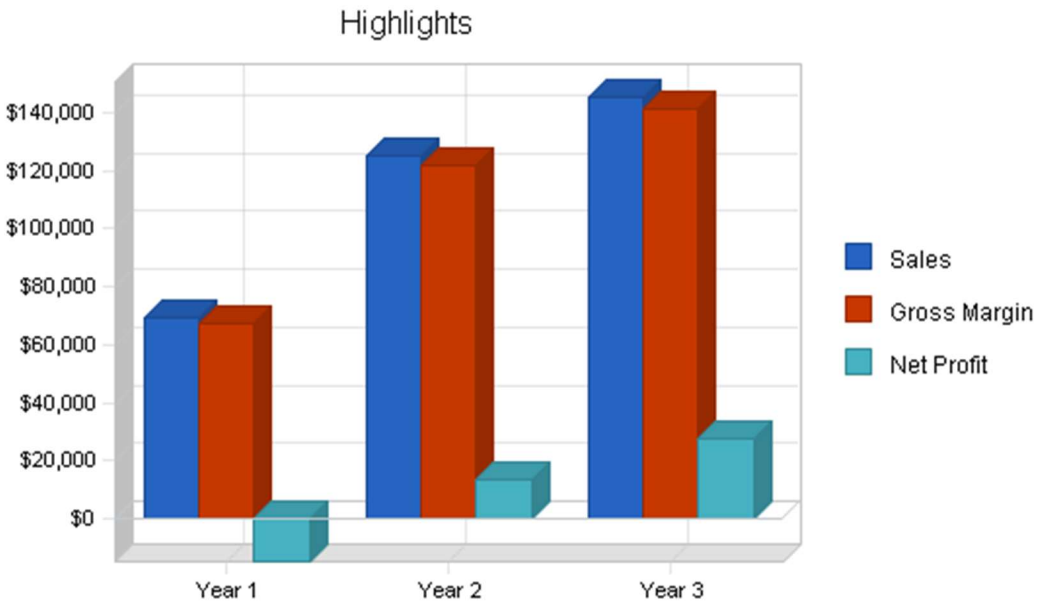

Figure 2

2.2 Advertising

Advertising is one of the most profitable uses of graphics; artists often do advertising work or take advertising potential into account when creating art, to increase the chances of selling the artwork. Most importantly, graphics give a good look to artwork whenever it is applied.

Figure 3

2.3 Political

The use of graphics for overtly political purposes—cartoons, graffiti, poster art, flag design, etc.

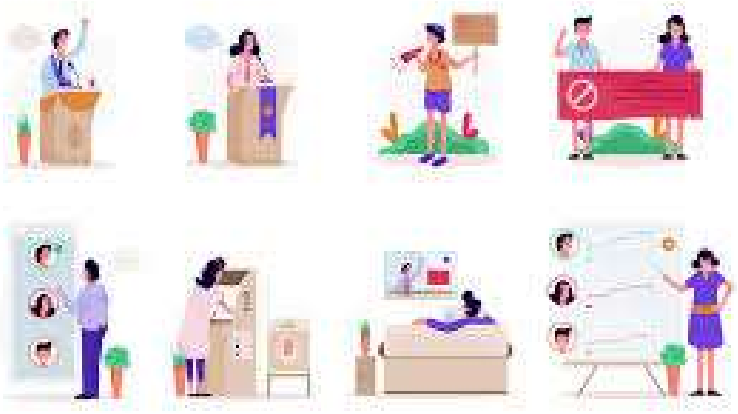

Figure 4

2.4 Education

Graphics are heavily used in textbooks, especially those concerning subjects such as geography, science, and mathematics, in order to illustrate theories and concepts.

Figure 5

2.5 Film and animation

Computer graphics are often used in the majority of new feature films, especially those with a large budget.

Figure 6

3. Various attributes of Images

Computers know nothing about images, or tone, color, truth, beauty, or art, all kinds of nifty stuff, but at its heart, it pretty much all comes down to pixels. Image has different attributes like Size, Color, Bit Depth and Resolution.

3.1 Image Size:

Image Size is the term given to describe the height and width of an image in pixels. Maximum Image Size is determined by the megapixels of a given camera - for example, a 10-megapixel camera will give a maximum image size of 2592 by 3872 pixels. The size of a graphics file is also measured in bytes.

3.2 Image Color:

A (digital) color image is a digital image that includes color information for each pixel. A color image has three values (or channels) per pixel and they measure the

intensity and chrominance of light. The actual information stored in the digital image data is the brightness information in each spectral band.

3.3 Image Bit Depth:

Bit depth is the attribute that dictates how many shades or colors the image can contain. Because each pixel's tone or color is defined by one or more numbers, the range in which those numbers can fall dictates the range of possible values for each pixel, and hence the total number of colors (or shades of gray) that the image can contain. For example, in a 1-bit image (one in which each pixel is represented by one bit of information—either a one or a zero) each pixel is either on or off, which usually means black and white. (Of course, if you printed with red ink on blue paper, the pixels would be either red or blue.) With two bits per pixel, there are four possible combinations (00, 01, 10, and 11), hence four possible values, and four possible colors or gray levels. Eight bits of information give you 256 possible values.

3.4 Image Resolution:

Resolution refers to the number of pixels in an image. Resolution is sometimes identified by the width and height of the image as well as the total number of pixels in the image. For example, an image that is 2048 pixels wide and 1536 pixels high (2048 x 1536) contains (multiply) 3,145,728 pixels (or 3.1 Megapixels).

4. Various Image file formats features and limitations

Image file formats are standardized means of organizing and storing digital images. An image file format may store data in an uncompressed format, a compressed format (which may be lossless or lossy), or a vector format. Image files are composed of digital data in one of these formats so that the data can be rasterized for use on a computer display or printer. There are different file formats like BMP, DIB, EPS, PIC and TIFF.

4.1 BMP file format (Windows bitmap) handles graphic files within the Microsoft Windows OS. Typically, BMP files are uncompressed, and therefore large and lossless; their advantage is their simple structure and wide acceptance in Windows programs.

4.2 A Device-Independent bitmap (DIB) is a raster image file that is similar in structure to the standard Bitmap files (BMP/image/bmp/)). It contains a color table

that describes the mapping of RGB colors to the pixel values. This enables DIB to represent image on any device.

4.3 EPS (short for Encapsulated PostScript) is a vector format designed for printing to PostScript printers and image setters. It is considered the best choice of graphics format for high resolution printing of illustrations. EPS files are created and edited in illustration programs such as Adobe Illustrator.

4.4 The PIC format is a device-independent raster image format; the file header stores information about the display hardware (screen resolution, color depth and palette information, bit planes and so on) separately from the actual image information, allowing the image to be properly transferred and displayed on computer systems with different hardware

4.5 The TIFF (Tagged Image File Format) format is a flexible format usually using either the TIFF or TIF filename extension. The tagged structure was designed to be easily extendible, and many vendors have introduced proprietary special-purpose tags – with the result that no one reader handles every flavor of TIFF file. TIFFs can be lossy or lossless, depending on the technique chosen for storing the pixel data.

Multiple Choice Questions

Q1. The smallest addressable screen element. Is called?

A. Pixel
B. Graph
C. Voltage level
D. Color information

Q2. Pixel on the graphics display represents?

A. Mathematical point
B. A region which theoretically can contain an infinite number of points
C. Voltage values
D. Picture

Q3. How many types of computer graphics are there?

A. One
B. Two
C. Three
D. Five

Q4. Which is not the attribute of image?

A. Size
B. Color
C. Weight
D. Resolution

Q5. Image Resolution means

A. The number of pixels in an image
B. The number of lines in an image
C. The color quality
D. Ratio of number of line to the number of pixel

Q6. EPS stands for

A. Encapsulated PostScript
B. Encapsulated PreStart
C. Encapsulated PreScript
D. Encapsulated PastScript

Short Answer type questions

Q1. Define Graphics in Multimedia?

Q2. What are the types of Graphics?

Q3. What is the importance of Graphics in multimedia?

Q4. Discuss the Various attributes of Image!

Q5. What are Various Image file formats features?

Long Answer Type Question

Q1. What is multimedia graphics? Discuss its importance

Q2. Discuss in detail the different file formats!