GOA COLLEGE OF ENGINEERING

Tutorial No: 1

1. What is multimedia? What are different characteristics of multimedia?

a. Multimedia is the presentation of text, pictures, audio, and video with links and tools that allow the user to navigate, engage, create, and communicate using a computer.

b. Multimedia refers to the computer-assisted integration of text, drawings, still and moving images(videos) graphics, audio, animation, and any other media in which any type of information can be expressed, stored, communicated, and processed digitally.

c. Major characteristics or features of a Multimedia System :

    i. Very High Processing Power : To deal with large amounts of data, very high processing power is

    used.

    ii. File System : File system must be efficient to meet the requirements of continuous media. These

    media files require very high-disk bandwidth rates. Disks usually have low transfer rates and high latency rates. To satisfy the requirements for multimedia data, disk schedulers must reduce the latency time to ensure high bandwidth.

d. File formats that support multimedia : Multimedia data consists of a variety of media formats or file representation including ,JPEG, MPEG, AVI, MID, WAV, DOC, GIF,PNG, etc. AVI files can contain both audio and video data in a file container that allows synchronous audio-with-video playback. Like the DVD video format, AVI files support multiple streaming audio and video. Because of restrictions on the conversion from one format to the other, the use of the data in a specific format has been limited as well.

e. Input/Output : In multimedia applications, the input and output should be continuous and fast. Real-time recording as well as playback of data are common in most of the multimedia applications which need efficient I/O.

f. Operating System : The operating system must provide a fast response time for interactive applications. High throughput for batch applications, and real-time scheduling,

g. Storage and Memory : Multimedia systems require storage for large capacity objects such as video, audio, animation and images. Depending on the compression scheme and reliability video and audio require a large amount of memory.

h. Network Support : It includes internet, intranet, LAN, WAN, ATM, Mobile telephony and others. In recent years, there has been a tremendous growth of multimedia applications on the internet like streaming video, IP telephony, interactive games, teleconferencing, virtual world, distance learning and so on. These multimedia networking applications are referred to

as continuous-media applications and require high communication latency. Communication Latency is the time it takes for a data packet to be received by the remote computer.

i. Software Tools : For the development of multimedia applications, the various software tools like programming languages, graphics software, multimedia editing software's scripting languages: authoring tools, design software's etc are required. In addition to these the device drivers are required for interfacing the multimedia peripherals.

2. What are software and hardware requirements for multimedia computers?

a. Multimedia Hardware Requirements :

- CPU : Central Processing Unit (CPU) is an essential part in any computer. It is considered as the brain of a computer, where processing and synchronization of all activities takes place. The efficiency of a computer is judged by the speed of the CPU in processing of data. For a multimedia computer a Pentium processor is preferred because of higher efficiency.

- Monitor : The monitor is used to see the computer output. Generally, it displays 25 rows and 80 columns of text. The text or graphics in a monitor is created as a result of an arrangement of tiny dots, called pixels. Resolution is the amount of details the monitor can render. Resolution is defined in terms of horizontal and vertical pixels (picture elements) displayed on the screen.

- Video Grabbing Card : We need to convert the analog video signal to digital signal for processing in a computer. Normal computer will not be able to do it alone. It requires special equipment called video grabbing cards and software for this conversion process. This card translates the analog signal it receives from conventional sources such as a VCR or a video camera, and converts them into digital format.

- Sound Card : Today's computers are capable of creating the professional multimedia needs. Not only can you use a computer to compose your own music, but it can also be used for recognition of speech and synthesis. It can even read back the entire document for you. But before all this happens, we need to convert the conventional sound signal to computer understandable digital signals. This is done using a special component added to the system called a sound card.

- CD-Rom : CD-ROM is a magnetic disk of 4.7 inches diameter and it can contain data up to 680 Megabytes. It has become a standard by itself basically for its massive storage capacity, faster data transfer rate. To access CD-ROM a very special drive is required and it is known as CD-ROM drive.

b. Multimedia Software Requirements :

- Adobe CS4 : Adobe CS4 is a collection of graphic design, video editing, and web development applications made by Adobe Systems many of which are the industry standard that includes

- Adobe Dreamweaver : Although a hybrid WYSIWYG and code-based web design and development application, Dreamweaver's WYSIWYG mode can hide the HTML code details of pages from the

user, making it possible for non-coders to create web pages and sites. WYSIWYG (What You See Is What You Get) web development software that allows users to create websites

without using Html, everything can be done visually.

- Adobe Fireworks : A graphics package that allows users to create a bitmap and vector graphics editor with features such as: slices, the ability to add hotspots etc.) for rapidly creating website prototypes and application interfaces.

- Google Sketchup : SketchUp is a 3D modeling program designed for architects, civil engineers, filmmakers, game developers, and related professions .

- Photoshop Pro : Adobe Photoshop, or simply Photoshop, is a graphics editing program

developed and published by Adobe Systems. It is the current market leader for commercial bitmap and image manipulation software, and is the flagship product of Adobe Systems. It has been described as "an industry standard for graphics professionals"

- Microsoft Powerpoint : Powerpoint Presentations are generally made up of slides that may contain text, graphics, movies, and other objects, which may be arranged freely on the slide.

- Adobe Flash Player : Adobe Flash (formerly Macromedia Flash) is a multimedia platform that is popular for adding animation and interactivity to web pages. Originally acquired by Macromedia, Flash was introduced in 1996, and is currently developed and distributed by Adobe Systems. Flash is commonly used to create animation, advertisements, and various web page Flash components, to integrate video into web pages, and more recently, to develop rich Internet applications.

- Adobe Shockwave : Adobe Shockwave (formerly Macromedia Shockwave) is a multimedia player program, first developed by Macromedia, acquired by Adobe Systems in 2005. It allows Adobe Director applications to be published on the Internet and viewed in a web browser on any computer which has the Shockwave plug-in installed.

3. Write the differences between the following :

a. **Image vs Graphics** : Difference Between Graphics and Images is that a graphic, or graphical image, is a

digital representation of nontext information such as a drawing, chart, or photo. While an image which can be also called as Still Image, Digital image is the binary representation of any type of visual information like drawings, individual video frames, logos, pictures, graphs etc.

b. **Video vs Animation** : A video is created using a camcorder, mobile, or a movie camera and no preparation is needed and one can just pick up the camera and start shooting any object, still or moving, with the camera. Animation is created by a cartoonist or an artist who draws a series of illustrations in different angles that are fed into a computer to convert them into a video mode adding music or voices. Making animation is more difficult than creating a video but once converted into a video; there is virtually no difference between the two.

4. What do you understand about interactive multimedia?

→ Interactive media is the name given to any method of communication that depends on a user's (or multiple users') input. This information can be transmitted a number of ways, from a streaming menu to a digital art installation. Basically, any form of media that responds to a user's actions will fall under the broad and innovative umbrella of interactive media.

5. How multimedia is used in engineering ?

→ Multimedia is frequently used by software engineers in computer simulations for military or industrial training. It's also used for software interfaces created by creative experts and software engineers in partnership. Only multimedia is used to perform all the minute calculations.

6. How is multimedia used in corporate communication ?

a. Multimedia is any content that uses a combination of different content forms such as text, audio, images, animations, video and interactive content. Multimedia can be recorded and played, displayed, interacted with or accessed by information content processing devices, such as computerized and electronic devices. Multimedia platforms are the spaces that you can use to make, share, or view this content. This means that multimedia platforms offer an array of communication and education applications to business audiences. Business presentations, blogs, wikis and podcasts are all excellent examples of how multimedia platforms can get the message across.

b. One of the most common uses of multimedia platforms today is to create and deliver effective business presentations. Although paper handouts, flip-charts, and props are still used, they can fall short in several respects.

c. Multimedia slides created by applications such as PowerPoint, Keynote, Adobe Presenter, or Prezi can provide the basis for effective presentations. These applications provide professional color, graphic and font capabilities, which help to better express the presenter's ideas. They can integrate video, audio and hyperlinks into the presentation, providing a great vehicle for a successful meeting.

d. Another multimedia platform to effectively communicate with business audiences is the blog. A blog is really a website with journal-style entries on topics designed to inform and invite comments. Blogs are used in business to communicate with customers and employees. For customers, blogs are a great vehicle for market research, public relations, customer outreach and solicitation of feedback.

e. A wiki is a web-based platform that usually serves as a knowledge base. Wikis are composed of combined knowledge from an online community of contributors. In a business

environment, private intranets are used to keep wikis within the company firewall as they are the repository of sensitive company procedures and processes.

f. In addition to presentations, blogs and wikis, podcasts are another multimedia tool used for effective business communication. Podcasts can take advantage of all the techniques we have discussed in this module so far but are primarily video and audio-based.

7. Explain data elements of multimedia and areas where multimedia elements are used?

→ Multimedia consists of the following 5 components:

a. Text : Characters are used to form words, phrases, and paragraphs in the text. Text appears in all multimedia creations of some kind. The text can be in a variety of fonts and sizes to match the multimedia software's professional presentation. Text in multimedia systems can communicate specific information or serve as a supplement to the information provided by the other media.

b. Graphics : Non-text information, such as a sketch, chart, or photograph, is represented digitally. Graphics add to the appeal of the multimedia application. In many circumstances, people dislike reading big amounts of material on computers. As a result, pictures are more frequently used than words to clarify concepts, offer background information, and so on. Graphics are at the heart of any multimedia presentation. The use of visuals in multimedia enhances the effectiveness and presentation of the Adobe Photoshop is a popular graphics editing program that allows you to effortlessly change graphics and make them more effective and appealing.

c. Animations : A sequence of still photographs is being flipped through. It's a set of visuals that give the impression of movement. Animation is the process of making a still image appear to move. A presentation can also be made lighter and more appealing by using animation. In multimedia applications, the animation is quite popular. The following are some of the most regularly used animation viewing programs: Fax Viewer, Internet Explorer, etc.

d. Video : Photographic images that appear to be in full motion and are played back at speeds of 15 to 30 frames per second. The term video refers to a moving image that is accompanied by sound, such as a television picture. Of course, text can be included in videos, either as captioning for spoken words or as text embedded in an image, as in a slide presentation. The following programs are widely used to view videos: Real Player, Window Media Player, etc.

e. Audio : Any sound, whether it's music, conversation, or something else. Sound is the most serious aspect of multimedia, delivering the joy of music, special effects, and other forms of entertainment. Decibels are a unit of measurement for volume and sound pressure level. Audio files are used as part of the application context as well as to enhance interaction. Audio files must occasionally be distributed using plug-in media players when they appear within online applications and web pages. MP3, WMA, Wave, MIDI, and RealAudio are examples of audio formats. The following programs are widely used to view videos: Real Player, Window Media Player, etc.

8. What are multimedia authoring tools?

→ Multimedia authoring is a process of assembling different types of media contents like text, audio, image, animations and video as a single stream of information with the help of various software tools available in the market. Multimedia authoring tools give an integrated environment for joining together the different elements of a multimedia production. It gives the framework for organizing and editing the components of a multimedia project. It enables the developer to create interactive presentations by combining text, audio, video, graphics and animation.

9. Explain 5 major applications of multimedia systems

→ Multimedia indicates that, in addition to text, graphics/drawings, and photographs, computer information can be represented using audio, video, and animation. Multimedia is used in:

a. Education : In the subject of education, multimedia is becoming increasingly popular. It is often used to produce study materials for pupils and to ensure that they have a thorough comprehension of various disciplines. Edutainment, which combines education and entertainment, has become highly popular in recent years. This system gives learning in the form of enjoyment to the user.

b. Entertainment : The usage of multimedia in films creates a unique auditory and video impression. Today, multimedia has completely transformed the art of filmmaking around the world. Multimedia is the only way to achieve difficult effects and actions. The entertainment sector makes extensive use of multimedia. It's particularly useful for creating special effects in films and video games. The most visible illustration of the emergence of multimedia in entertainment is music and video apps. Interactive games become possible thanks to the use of multimedia in the gaming business. Video games are more interesting because of the integrated audio and visual effects.

c. Business : Marketing, advertising, product demos, presentation, training, networked communication, etc. are applications of multimedia that are helpful in many businesses. The audience can quickly understand an idea when multimedia presentations are used. It gives a simple and effective technique to attract visitors' attention and effectively conveys information about numerous products. It's also utilized to encourage clients to buy things in business marketing.

d. Technology & Science : In the sphere of science and technology, multimedia has a wide range of applications. It can communicate audio, films, and other multimedia documents in a variety of formats. Only multimedia can make live broadcasting from one location to another possible. It is beneficial to surgeons because they can rehearse intricate procedures such as brain removal and reconstructive surgery using images made from imaging scans of the human body. Plans can be produced more efficiently to cut expenses and problems.

e. Fine Arts : Multimedia artists work in the fine arts, combining approaches employing many media and incorporating viewer involvement in some form. For example, a variety of digital mediums can be used to combine movies and operas. Digital artist is a new word for these types of artists. Digital painters make digital paintings, matte paintings, and vector graphics of many varieties using

computer applications.

f. Engineering : Multimedia is frequently used by software engineers in computer simulations for military or industrial training. It's also used for software interfaces created by creative experts and software engineers in partnership. Only multimedia is used to perform all the minute calculations.