Hello everyone,today I'm going to discuss embedded systems. For computer science students .In the embedded system were are going to discuss Unit 1 introduction to embedded systems module name introduction to embedded systems. My name is Avani Anil Kharde .

So basically we're going to study the definition of a system. The definition of embedded system, and the various examples of embedded system.

At the end of the session, the students will be able to understand
what is system.
What is the embedded system
andthe various application areas where embedded systems are used?

So what are embedded systems?
Embedded system is one of the important subject because in our daily life we have seen so many electronic equipments in which this embedded systems are used that we have to know in our daily lives

we are using personal computer systems.But in personal computer system we are not using embedded system but we are using general purpose. Processor. There is, incase of a television microwave. We are using embedded system.

Before we start with the definition of embedded system,one should know what is the meaning of a system.

System is nothing but it is the arrangement in which all its units are assembled together according to the set of rules.They perform the particular operation according to the predefined set of rules.

For example, we will consider the wrist watch. It is a time displaying system, so watch is a system
which is showing its time. Its components follow some set of rules to show the time. Suppose one of its components or apart fades then watch will stop working. So therefore we can say that in a system, all its components depends on what other all units depend on each other.So system is something which works as per the predefined set of rules.

Now we go further for the definition of Embedded system

Embedded system consists of three main constraints. One it is a combination of a hardware and software. It's designed to perform a particular task and the task has to be completed in a given time.

Embedded systems are becoming the part of our daily life. Our daily activities are Using with a different applications examples, we can use the microwave oven which is the one of the example of a embedded system. Embedded system can be thought of as a computing device that is designed to serve a dedicated purpose.

The computing systemthat works on the various inputs. The inputs can be given by the user or the input can be taken from the various sensors and these inputs are processed by a different processors. Maybe you can use Raspberry Pi or a different microcontroller, and it gives a specified output.

We study now the different examples of the embedded systems.

The first will study the consumer applications.

In the consumer applications in a daily Life we are using the washing machine, remote control toys entertainment(Audio/Video) ,Clocks or wristwatch, games.

Other various electronic toys, now take example of a washing machine.

Washing machine is designed to perform a particular task of washing the clothes. There are different switches,sensors, buttons, displays our interface with their controlling device. These controlling device
will be working according to the predefined program as per their users requirement.

In this era,all objects are being automated from the industries. From the low end device, like aCalculator or a sensor to a very high end device like a robot or a missile guiding systems.

The second example in a communication applications where we can use a wireless (Pager,cell phone). In the examples, like a cell phones. Telephone answering machines,networking environment. We can use ATMs, credit card,Ethernet , can use in the Global positioning systems. These are the examples of the communication applications.

In the automotive applications we can use in the motor control,power, Windows ,safety(airbags), elevators.

We can also use the embedded systems for the military applications where we need to initially check
out the target recognition systems, in the path guidance, navigation andthe Aircrafts.

Further, though, in the initial areas where you can see a lot of industries use embedded system for a process control. This includes pharmaceutical cement, sugar, oil, explorations, nuclear energy, electricity
generation and transmissions.

In industrial applications the embedded system for industrial use are designed to carry out some specific tasks such as monitoring the temperature, pressure, humidity,voltage, current etc and then take appropriate action based on monitored levels to control the other devices or to send the information to centralized monitoring station.

In the medical application , the embedded systems are used in every medical equipments in the
Hospital. This equipment includes diagnostic aids such as ECG, EEG, blood pressure measuring Devices, X Ray scanners, equipment using a blood analysis, radiation,endoscopy, etc. Also, it can be used in the cardiac monitors, treatment,dialysis machines and many more.

In the office we can use embedded systems for office automation products such as fax machine, copy machine,smartphone systems, modern scanners, printers.etc

The examples of embedded systems in the computer networking products , such as bridges, routers, integrated services digital networks(ISDN) ,Asynchronous Transfer mode(ATM),X.25 and frame relay switches are embedded systems which implement the necessary data communication protocols. For example a router interconnects two networks.

In the field of the telecommunication, embedded systems can be categorized as a subscriber terminals and network equipment.

In a subscriber, terminals such as key telephones, ISDN, phones,terminal adapters, web cameras are embedded systems, whereas in case of a network equipment includes multiplexes, multiple access systems, packet assemblers, diassembers (PDAs),satellite modems, etc. IP phone IP gateways. IPgatekeepers are also comes under the network equipment.

The latest embedded systems that provide very low cost voice communication over the Internet.

The examples of the embedded systems in the security area, as the security plays important role, at the homes offices as well as in the airports for authentication and verifications We're using the embedded systems. The encryption devices are used to encrypt the data or voice being transmitted on a communication Links such as telephone lines.

In Biometric systems using fingerprints and face recognitions are now extremely used for user authentication. In a banking applications as well As for access control in a high security buildings.

In the financial sectors.

Embedded systems are used in a ATM machines where the cash and checks are now slowly paving away from the regular routine transactions, smart card of the size of a credit card has a small Microcontroller and a memory ,and interacts with a smart card reader or ATM machine and act as an electronic wallet.

To conclude about this, embedded systems are nothing but a core part of any technology.

And these are the references.

Thank you.