Automation / Telecommuting

Units 5 & 6

01

Why do companies use automation?

02

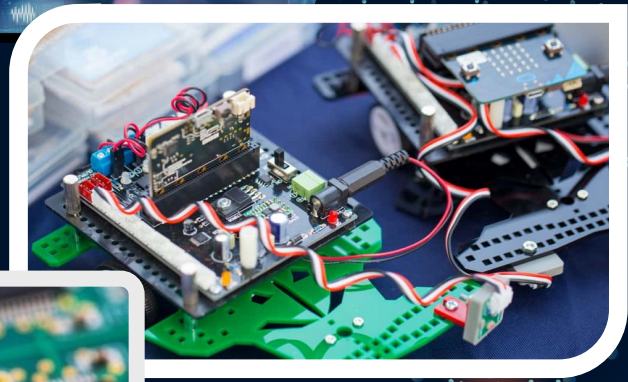
How has automation advanced recently?

Automation describes a wide range of technologies that reduce human intervention in processes.

An embedded system is a combination of computer hardware and software designed for a specific function.

An electronic circuit formed on a small piece of semiconducting material, which performs the same function as a larger circuit made from discrete components.



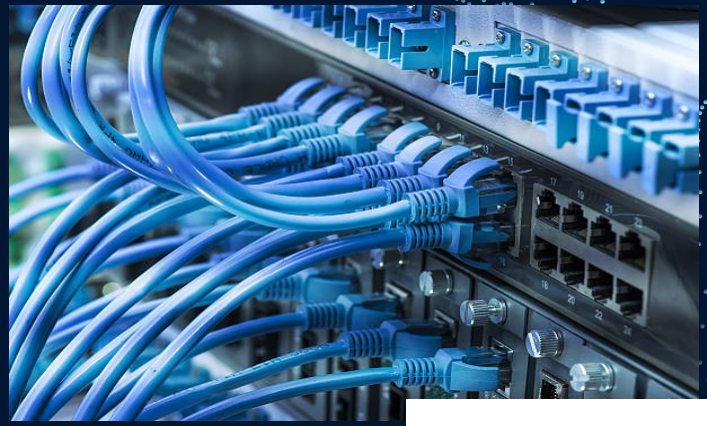


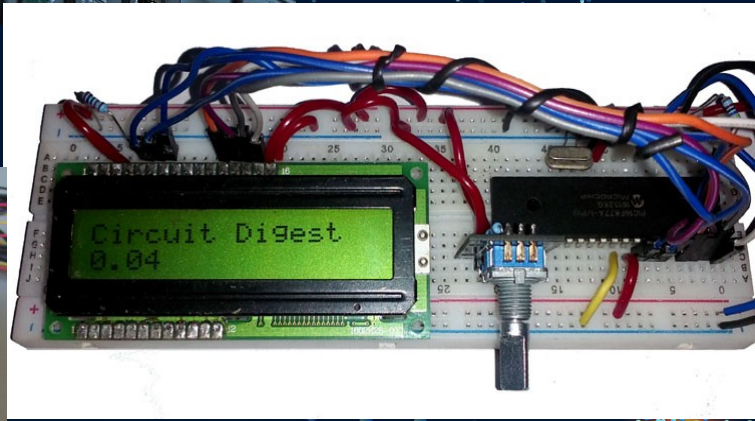


Ethernet protocol connects LANs, WANs, Internet, cloud, IoT devices, Wi-Fi systems into one seamless global communications network

An encoder (or "simple encoder") in digital electronics is a one-hot to binary converter.

Redundancy is a system design in which a component is duplicated so if it fails there will be a backup.





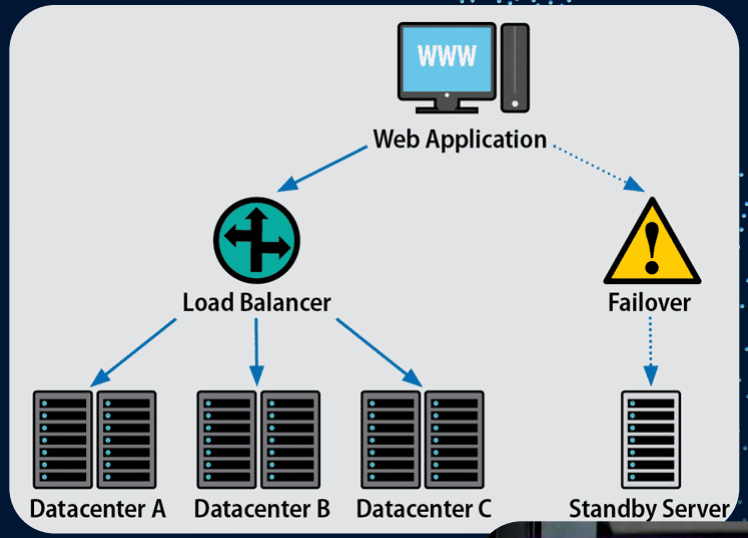


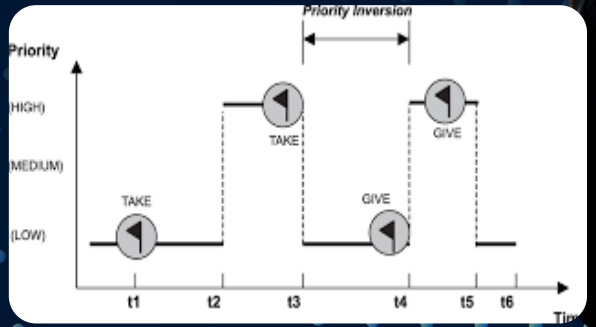
1. What types of encoder do you know?
2. Where do we use encoders?

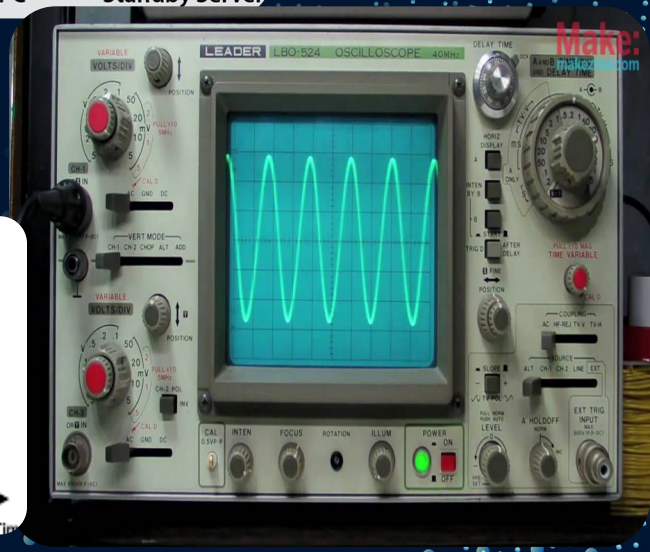
Fault tolerance refers to the ability of a system (computer, network, cloud cluster, etc.) to continue operating without interruption when one or more of its components fail.

Oscilloscope is a device for viewing oscillations by a display on the screen of a cathode ray tube.

In computer science, priority inversion is **a scenario in scheduling in which a high priority task is indirectly superseded by a lower priority task**







3 **Match the words (1-7) with the definitions (A-G).**

1 C Ethernet network
2 B fault tolerant
3 G priority inversion
4 A encoder
5 D automation
6 E open system
7 F computer aided manufacturing

A a device that relays mechanical data to a network
B the ability to continue functioning after an error
C this links computers together at high speeds
D the use of machines to perform tasks without human assistance
E a system that can use many different types of machines
F the use of programs to control machines that manufacture products
G a software problem that can lower production

Listening

6 Listen to the conversation about solving an automation problem. Check (✓) the items the engineers investigate.

1 ☑ priority inversions

2 ☑ Ethernet network connections

3 ☐ fault tolerant

4 ☐ latency

7 Listen again and complete the conversation.

Engineer 1: Let's **1** _____ _____ _____. Take a look at that conveyor belt moving the soda bottles forward. **2** _____ _____?

Engineer 2: Yeah, it looks a little jerky.

Engineer 1: Let's **3** _____ _____ _____ at the oscilloscope pattern.

Engineer 2: Yeah, something is definitely wrong.

Engineer 1: Very good. **4** _____ _____ on how to fix it?

Engineer 2: How about checking the **5** _____ _____. Maybe the computer can't communicate.

Engineer 1: Good idea. Let's check it out. Does this computer log look normal to you?

Engineer 2: Well, the Ethernet connection is fine, but **6** _____ _____ _____.

WORLD Industries

INVESTOR REPORT

In today's business world, investors are looking for companies that can compete. That's why World Industries is proud to announce an upgraded **automation** system that will increase production and efficiency. As you consider investing in our company, see what this new system will do.

World Industries' system uses **CAM** (Computer Aided Manufacturing) programs. Our integrated system of hardware and software allows for complete computer integrated manufacturing.

The new production line employs **embedded systems** and **integrated circuits**, allowing the hardware to work together. These devices are connected through a high-speed **Ethernet network**. **Encoders** in each device send mechanical information to the network through device drivers.

We have an **open system** that allows us to use any type of equipment. Our devices have a high **redundancy** for simple replacement.

Equipment at World Industries is designed to work fast and hard. All of our machines have the lowest possible **latency** time and a high **fault tolerant**. Our software is protected from **priority inversions** that could lower production. **Oscilloscopes** monitor all of our hardware to ensure that any problem will be repaired immediately by our trained engineers.

Our investments in automation have rewarded us with success. An investment in World Industries will do the same for you.

1 What is the main idea of the report?

A why World Industries has slowed production

B how World Industries has improved its automation

C why World Industries should invest in automation

D where World Industries is building a new automation system

2 What does NOT protect the efficiency of an automation system?

A low latency

B high redundancy

C high fault tolerant

D low network speeds

3 What can you infer about a machine with low redundancy?

A It is difficult to replace.

B It is in a closed system.

C Its oscilloscope is broken.

D Its latency time is too low.



4 Fill in the blanks with the correct words:

oscilloscope, integrated circuit, latency time, redundancy, embedded system.

1 Check the oscilloscope to see if this machine is working correctly.

2 A(n) integrated circuit is very small but has several devices attached to it.

3 If the latency time on the machine is too long, it might need a new processor.

4 This factory has low redundancy, so it doesn't replace machines quickly.

5 The embedded system has the newest software and hardware.

Automation [NOUN-UNCOUNT-U5] Automation is the use of programmed machines to perform tasks without human assistance.

Embedded system [N-COUNT-U5] An embedded system is a combination of hardware and software designed to perform a specific task.

integrated circuit [N-COUNT-U5] An integrated circuit is a small chip that has several electronic devices attached to it.

open system [NOUN-COUNT-U5] An open system is a system that can use many different types of machines.

Ethernet network [NOUN-COUNT-U5] An Ethernet network is a high-speed network that links computers together.

Encoder [NOUN-COUNT-U5] Encoders are devices that convert mechanical information into electronic signals.

redundancy [NOUN-UNCOUNT-U5] Redundancy is the inclusion of duplicate components in a system to maintain production when one component fails.

fault tolerant [NOUN-UNCOUNT-U5] Fault tolerant is the ability to continue functioning even though an error has occurred.

oscilloscope [NOUN-COUNT-U5] An oscilloscope is a device that allows the user to view the electrical voltage of a machine.

priority inversion [NOUN-COUNT-U5] A priority inversion is a delay that occurs in a computer system when a low-priority task is dealt with before a high-priority task.

Speaking

8 **With a partner, act out the roles below based on Task 7. Then, switch roles.**

USE LANGUAGE SUCH AS:

It looks a little jerky.

Do you have any ideas on how to fix it?

Does this computer log look normal to you?

Student A: You are an engineer. Help Student B identify a problem. Ask about:

- what the problem is
- possible solutions

Student B: You are an engineer. Answer Student A's questions.

Writing

9 **You are going to invest in a company that uses automation. Use the report and conversation from Task 8 to write a letter to a friend explaining why it is a good investment (120-150 words). Make up a name for your friend. Talk about:**

- *What automated systems the company has*
- *How automation improves the business*
- *How the company protects and repairs the system*

Telecommuting



Let’s discuss these questions!



What are the benefits of telecommuting?



What are the challenges of telecommuting , for workers and management?

Vocabulary

3 Match the words (1-6) with the definitions (A-F).

1 B toggle
2 C dashboard
3 A real time
4 D web-based
5 F telecommute
6 E message board

A being updated as new information arrives
B to switch from one file to another
C a display that shows recently used files
D available on the Internet
E a series of pages that offer information about a product
F to work away from an office using technology

4 Place the words from the word bank under the correct heading.

word BANK

Basecamp® centralize tour gallery
Skype™ color-code

Programs	Actions	Website Features
Skype Basecamp	centralize color-code	tour gallery


freephoneline.ca
DSL
Making phone calls
over the Internet
CAREER
PATHS

Mr. Tobin,

I'm writing to you today on behalf of several employees with a request to start a **telecommuting** program here at Zone Solutions. To do so will require changes, but they would ultimately benefit our company.

I suggest that we invest in **Basecamp®**. It's a **web-based** software package. Regardless of where we're working, it will increase productivity. Basically, we would **centralize** all projects, communication and updates.

Basecamp® opens in any browser, so employees can use it from home or the office. And it's easy to navigate, so there's no training required. **Color-coding** identifies different projects. The **dashboard** displays recently accessed files, so we can all see what is being worked on. The project **gallery** allows everyone to **toggle** quickly between files. And a **message board** is updated in **real time** to facilitate rapid exchanges.

In addition to Basecamp®, free **Skype™** software can be downloaded for any communications that require speaking person to person. We can have conference calls with clients around the world without even needing a phone. Should you require specific details, I would be happy to discuss the issue with you. Additionally, both Backpack® and Skype™ offer **tours** with detailed information about their products.

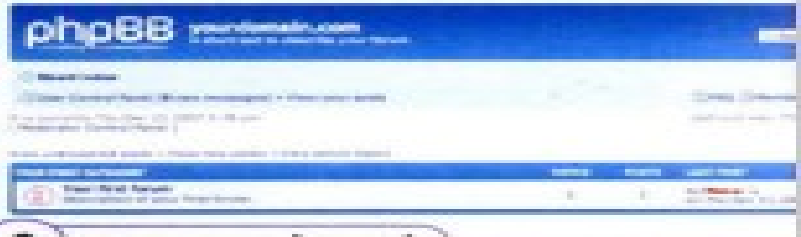
I look forward to your response.

Sincerely,

Erica Robin

Erica Robin





1 What is the employee doing in the letter?

A requesting that the company reorganize projects

B proposing an expansion of the telecommuting program

C suggesting that the company create web-based software

⇨ D explaining how employees could work from home

2 According to the letter, the dashboard...

A identifies projects by color.

B helps users toggle between files.

⇨ C shows what is being worked on.

D allows communication without a phone.

3 What can be inferred about Skype™?

A It is a part of the Basecamp® software package.

B It requires users to pay a monthly subscription.

C It provides better sound quality than phones.

⇨ D It allows users talk to each other on computers.

ning

6 **Listen to a conversation between an employee and manager. Mark the following statements as true (T) or false (F).**

1 T Basecamp® allows users to monitor production.

2 F The message board must be updated by users.

3 T Employees who telecommute will need high speed connections.

7 **Listen again and complete the conversation.**

O: Well, I can understand the employees' 1 _____ _____ _____. However, I have some questions.

E: I would expect so. Is there 2 _____ _____ _____?

O: Let's start with production. I'd need a way to check that people are getting work done at home.

E: Absolutely. The Basecamp® program would take care of that.

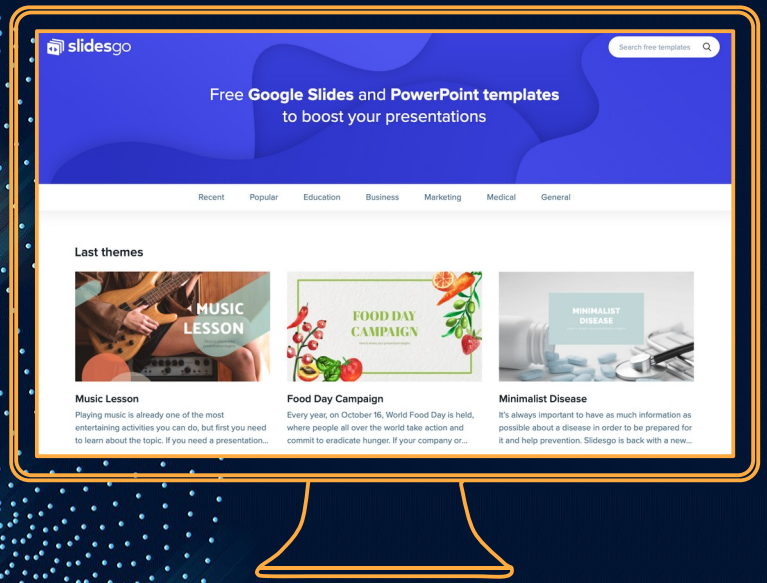
O: Really? I 3 _____ _____ the tour, but I didn't see anything about monitoring production.

E: It's on the dashboard. It shows all the files being worked on, and who's working on them.

O: Okay, 4 _____ _____ _____. Now, what about communication?

E: Well, there's the 5 _____ _____.

Home assignment



Writing

9 You are a manager and you are starting a telecommuting program. Use the letter and the conversation from Task 8 to explain the program in a memo to members of staff. (120-150 words). Talk about:

- *What programs you will use*
- *How projects will be organized*
- *Ways you will communicate*