BTEC Level 3 AAQ in IT

Unit 1 – Information Technology Systems

Part A1 – Functions and Use of Digital Devices

A1.1

Features of digital devices that form part or all of IT systems.

Personal Computers

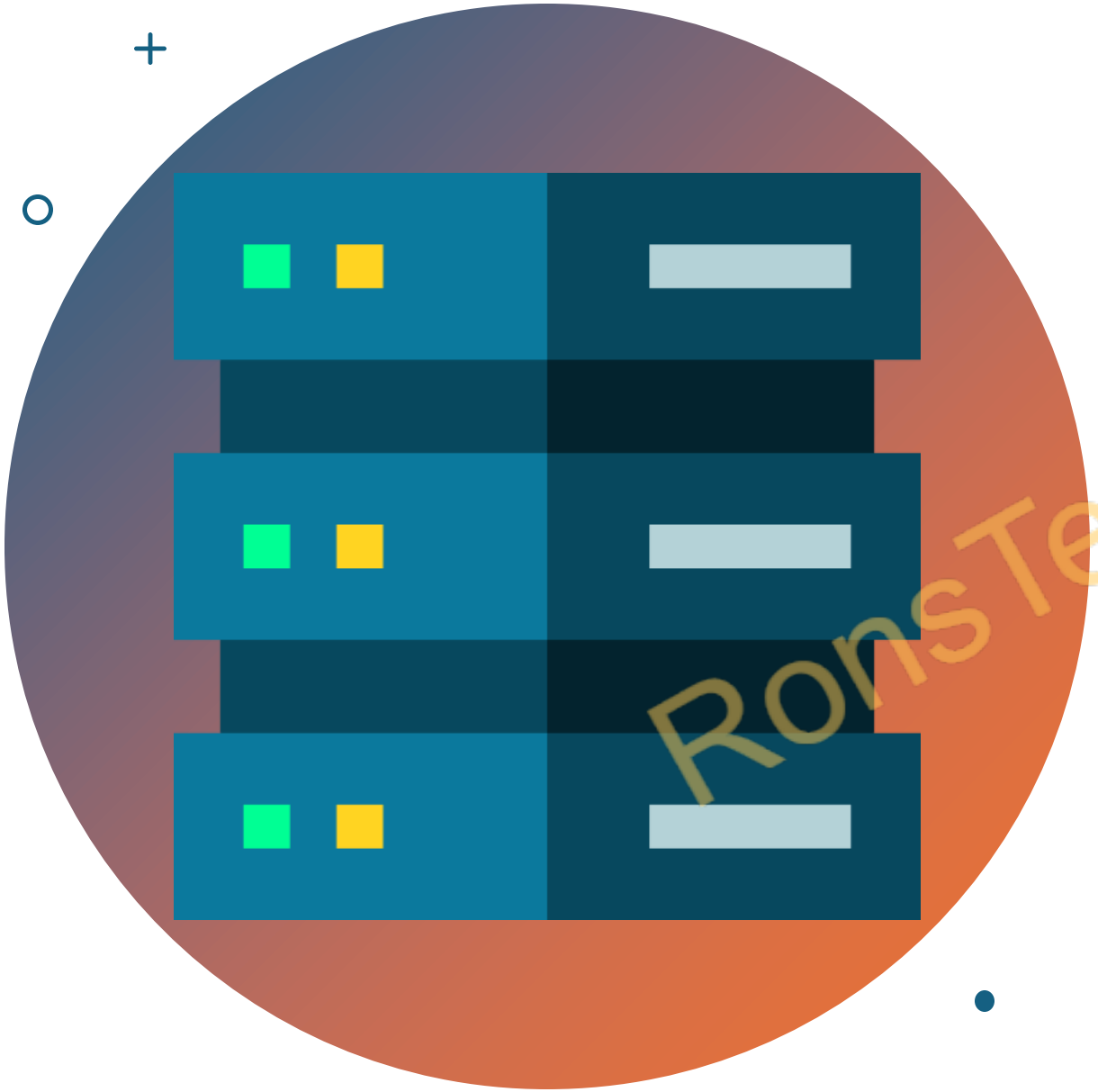
- Desktop and laptop computers.
- Used for general tasks.
- Communication, entertainment etc.
- Connect to networks and peripherals.

Multifunctional Devices/MFD

- Combine printing, scanning, copying.
- Support document management.
- Often network-connected.
- My example: Smart phone.

Mobile Devices

- Smartphones, tablets.
- Portable and wireless.
- Access apps and web services.



Servers

- File servers. Store files and are connected over a network. I use OpenMediaVault for my personal file server.
- Application servers. Run one or more applications, online games run on application servers (GTA 5, Rainbow 6).
- Web servers. Websites like www.RonsTechHub.com.

Entertainment Systems

- Video game consoles. Xbox Series S and X. PlayStation 5. Nintendo Switch 2.
- Streaming devices. Disney Plus, Amazon Prime Video. Netflix.
- Media players. Fire TV STicks, Google Chromes, Androdi Boxes, Apple TV Boxes.

Digital Cameras

- Capture still images.
- Record video.
- Can connect to computers or cloud.
- Most popular and compressed: JPG or JPEG.
- Raw files are DNG, NEF, CR2, ARW.

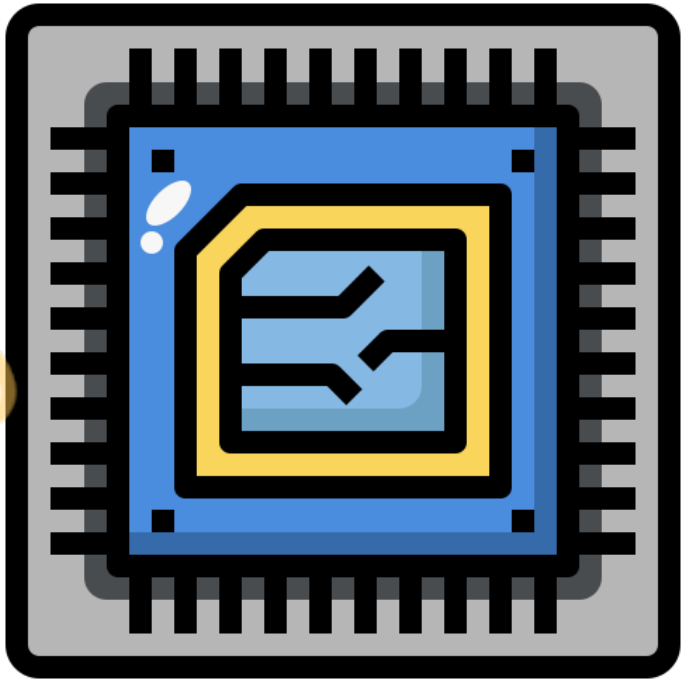
Navigation Systems

- GPS – Global Positioning System devices.
- Help with directions.
- Often integrated into vehicles.
- Uses satellites in orbit to work out locaton.

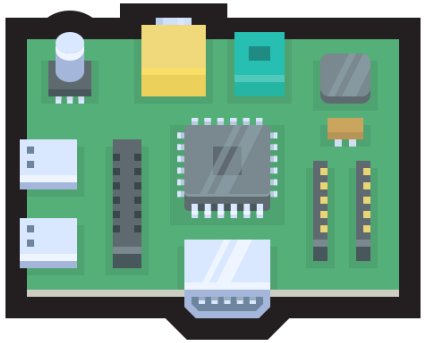
Communication Devices & Systems

- Phones and VoIP (Voice over IP)
- Email systems.
- Messaging apps.

Embedded Systems



- Built into machines.
- Use sensors.
- Part of IoT devices.
- Raspberry Pi Pico and Arduino devices are popular off the shelf MIcrocontrollers.
- IoT uses Embedded Systems connected to a network.



A1.2

Function and use of the above digital devices.

Personal Use

Communication and entertainment.

Organise schedules.

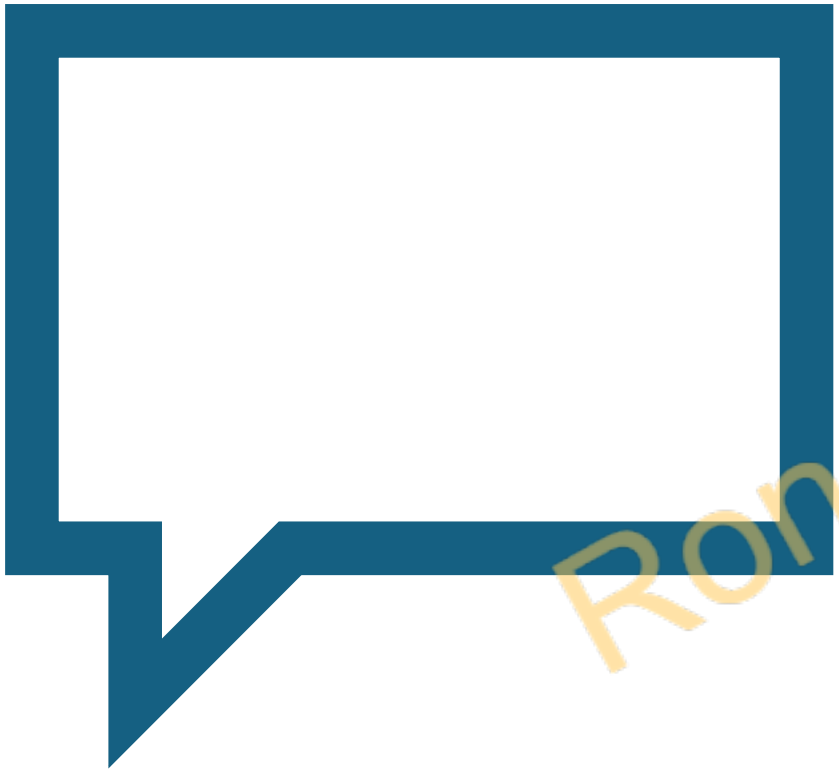
Access information.

All of the above: Smart phones, tablets, laptops, desktops, embedded systems, emails, messaging apps, GPS navigation, servers and printers.

Education & Training

- Online learning.
- Research and resources.
- Virtual classrooms.
- I use a laptop to make these PowerPoints. You might use a mobile phone, tablet or laptop to watch them.
- Interactive boards etc.

Social Use



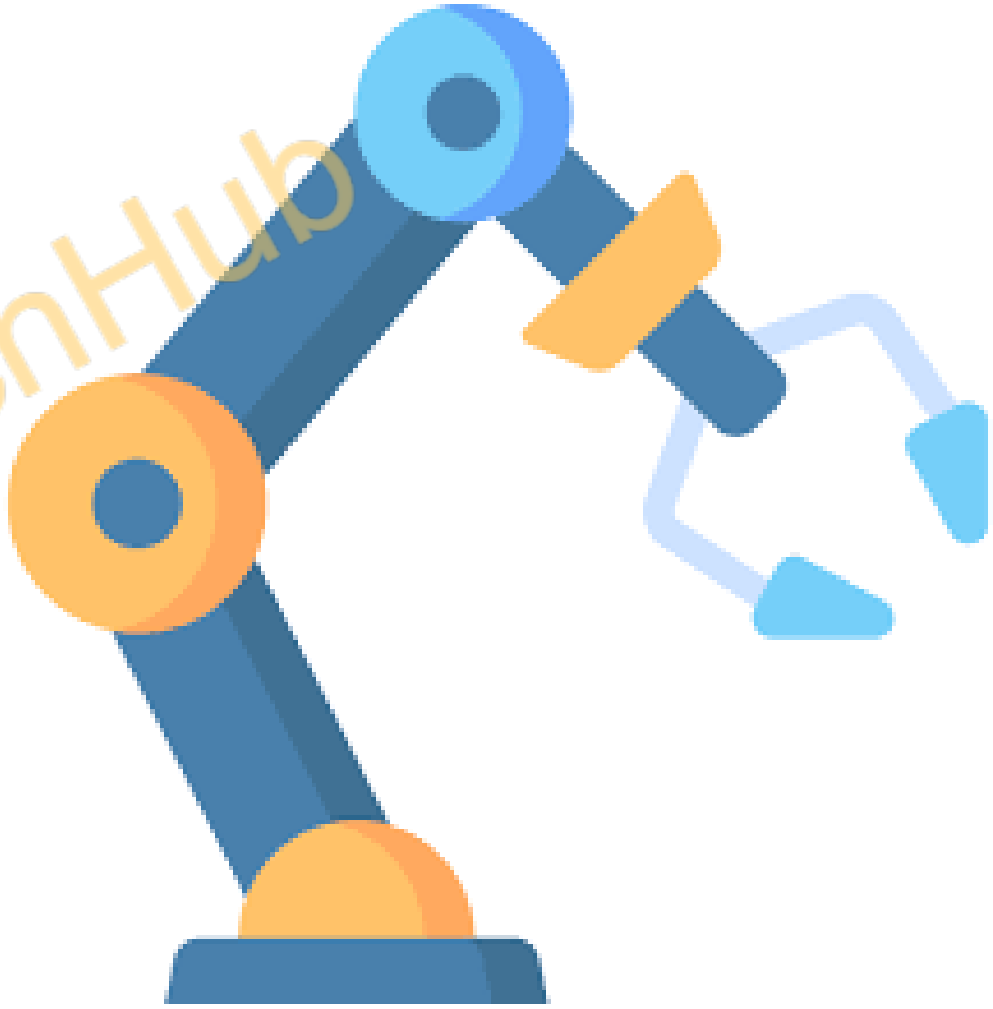
- Social media.
- Messaging apps.
- Video calls.
- Any device with an internet connection and the ability to use an internet browser or have apps installed.

Retail

- Used for managing sales, stock, and payments.
- Enable online shopping, barcode scanning, and self-checkouts.
- Examples include point-of-sale systems and tablets.

Manufacturing

- Control machinery and monitor production processes.
- Improve efficiency and quality control.
- Examples include industrial computers and sensors.

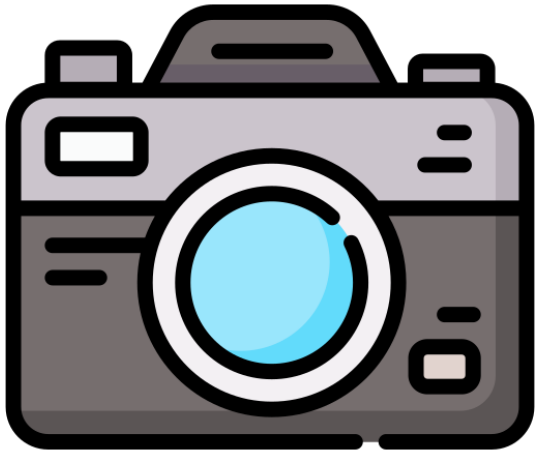


Healthcare

- Assist in patient monitoring and diagnosis.
- Store and share medical records securely.
- Examples include MRI machines, tablets, and health trackers.

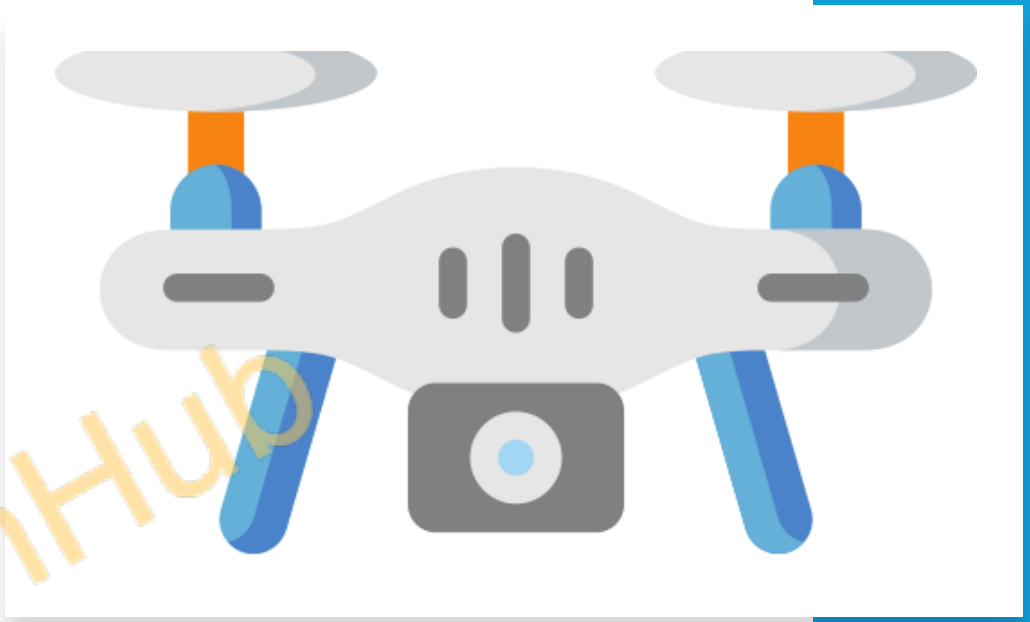
Creative

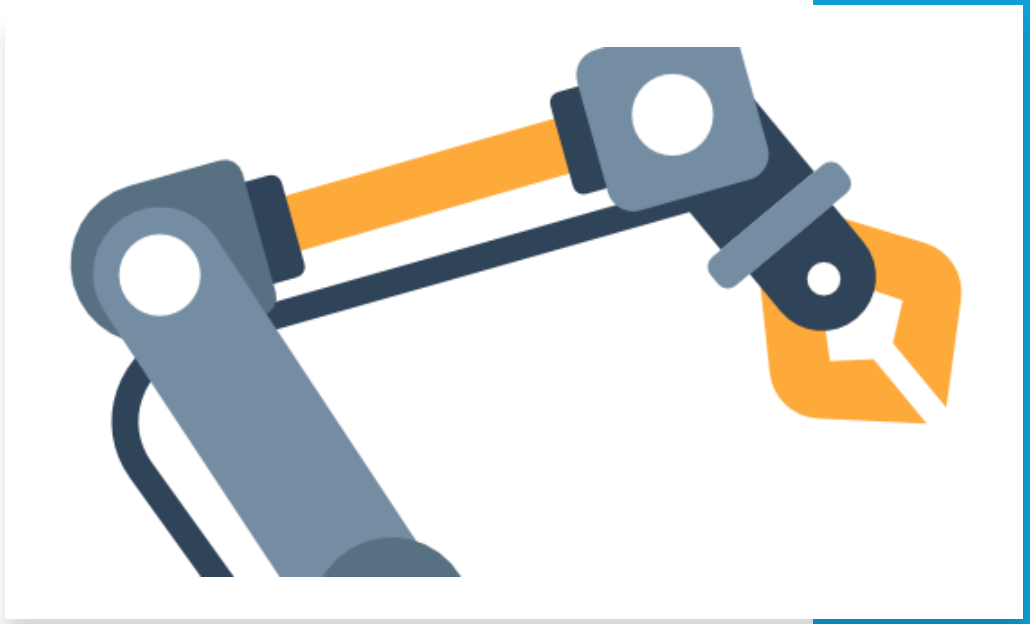
- Used for designing, editing, and producing creative work.
- Support photography, video editing, and graphic design.
- Examples include drawing tablets, editing software, and cameras.



Automation and Robotics

- Control automated systems and robots.
- Improve productivity, safety, and accuracy.
- Examples include robotic arms and programmable controllers.





A1.3

Forms of notation used to design IT systems.

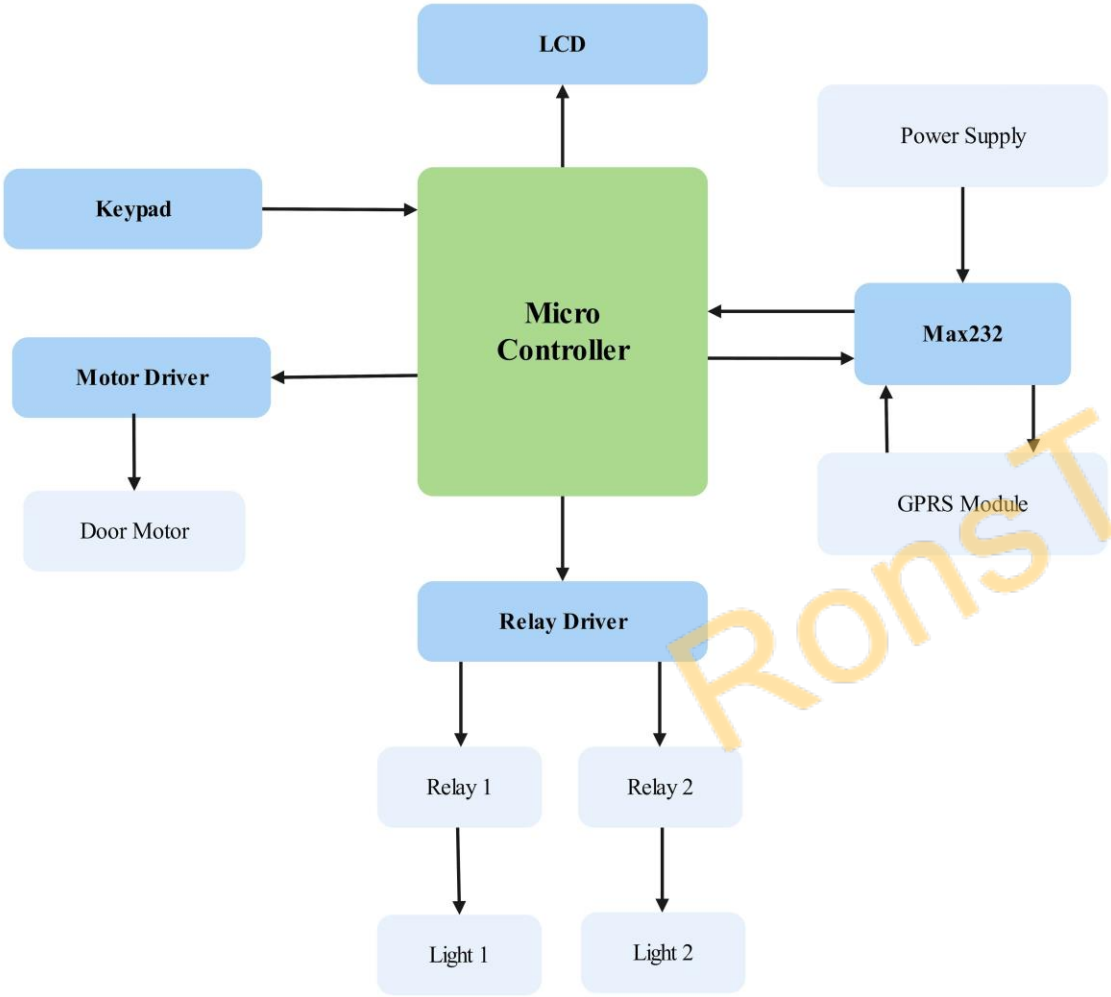
System Diagrams

A system diagram is a visual representation that shows the components of a system and how they are connected.

Block Diagrams, most common for IT at this level. Uses simple blocks to show the main parts of a system and how they connect

Network Diagram, shows how devices in a computer network are connected.

Data Flow Diagram, shows the movement of data through a system.



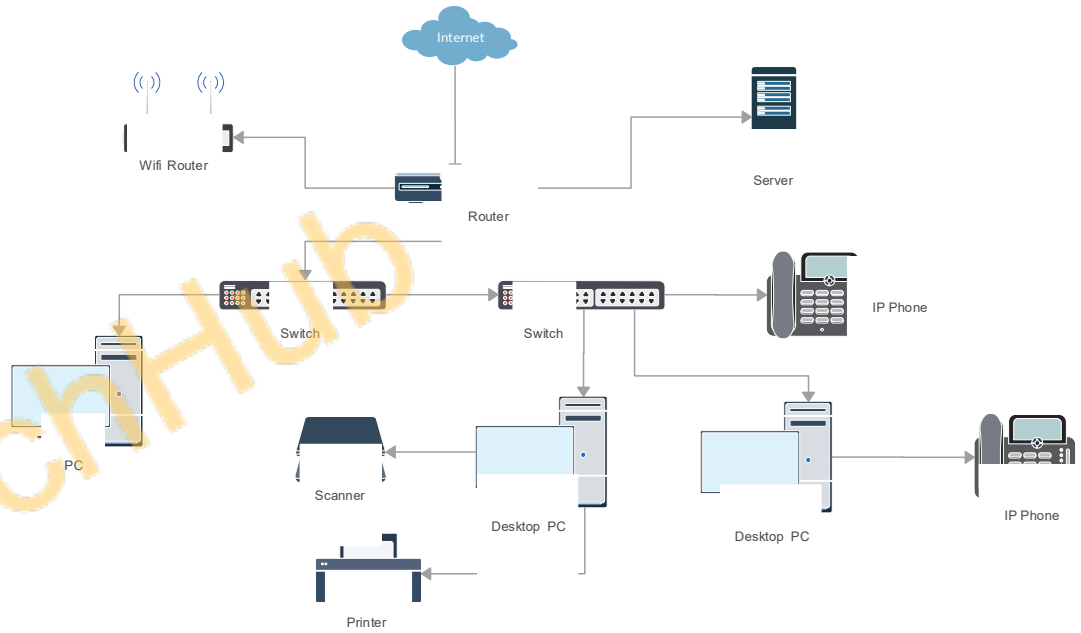
Block Diagram Example

- https://images.wondershare.com/edrawmax/article2023/block-diagram/microcontroller-block-diagram.jpg

Network Diagram Example

Usage Guide

1. - Select an object to view the quick toolbar. You can use it to edit text, customize colors, create links etc.
2. - Use the (+) icon on **left bottom** to browse templates, shape libraries, icons and more
3. - You can add/remove libraries by clicking "Browse More Shapes" in shapes section. There are over 130 libraries to choose from.
4. - Use the toolbar appearing on the **top right** to add comments, notes, change shape properties, add custom fields etc.
5. - hover over the small icon on the bottom right on this sticky for more detailed instructions.!



- https://svg.template.creately.com/jo83qjn51

Data Flow Diagram Example

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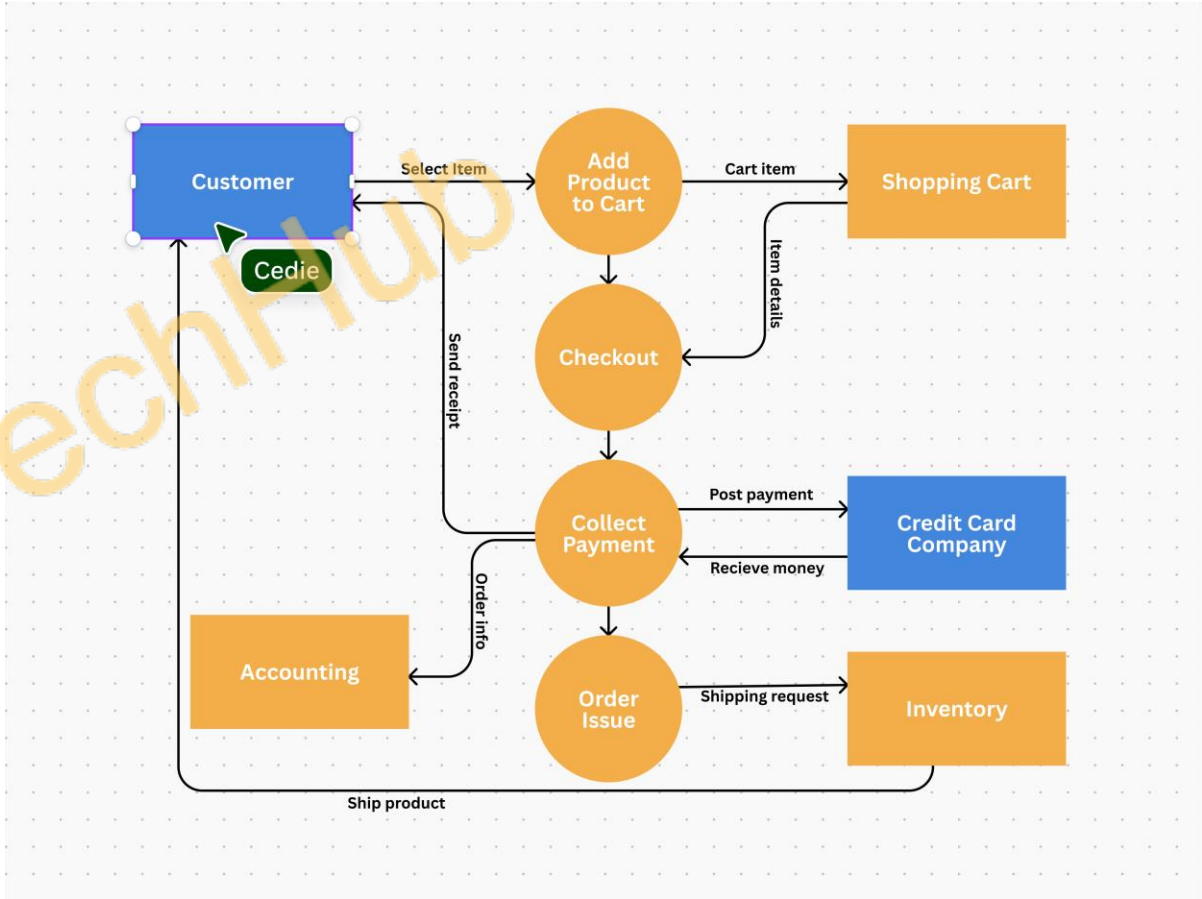


What is a Flowchart?

Visual diagram: It uses shapes and arrows to show the steps in a process.

Shows the flow: The arrows connect the shapes and show the order in which things happen.

Uses shapes for different things:

Ovals: Start and end of the process.

Rectangles: Actions or steps in the process.

Diamonds: Decisions that need to be made (yes/no questions).

Benefits of Flowchart

- Making complex processes easy to understand visually.
- Improving communication and collaboration.
- Finding bottlenecks and inefficiencies.
- Documenting processes clearly.
- Increasing efficiency and reducing errors.
- More or less the same for all forms of algorithm design.

Flowcharts Use Shapes

Oval: Represents the start or end of a process.

Rectangle: Represents a process, task, or action.

Diamond: Represents a decision point, where the flow can go in different directions depending on the answer.

Parallelogram: Represents input or output of data or information.

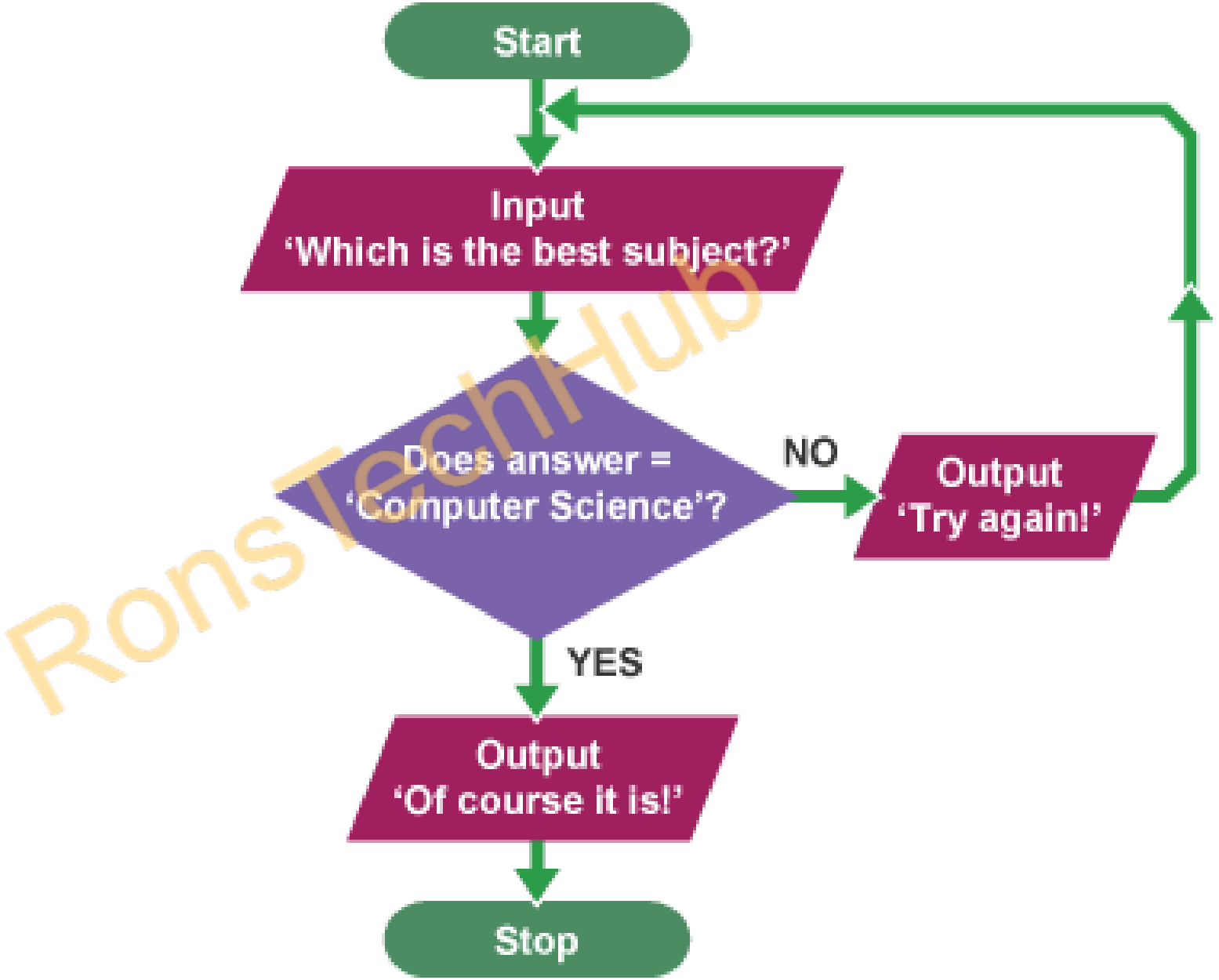
Arrows: Connect the shapes and show the direction of the flow.

Flowchart Shapes

BBC Bitesize

Symbol	Name	Function
	Start / End	An oval shape represents or end of a process
	Input / Output	A parallelogram represe output
	Decision	A diamond represents a
	Process	A rectangle represents a
	Arrow	An arrow is a connector relationships between th shapes and what they re

Flowchart Example



Flowchart To Code Example – Python 3

```
1  while True:
2      answer = input("What is the best subject?")
3      print(answer)
4      if answer == "Computer Science":
5          print("Of course it is... well done")
6          break
7
8      elif answer != "Computer Science":
9          print ("Error detected, please try again")
```