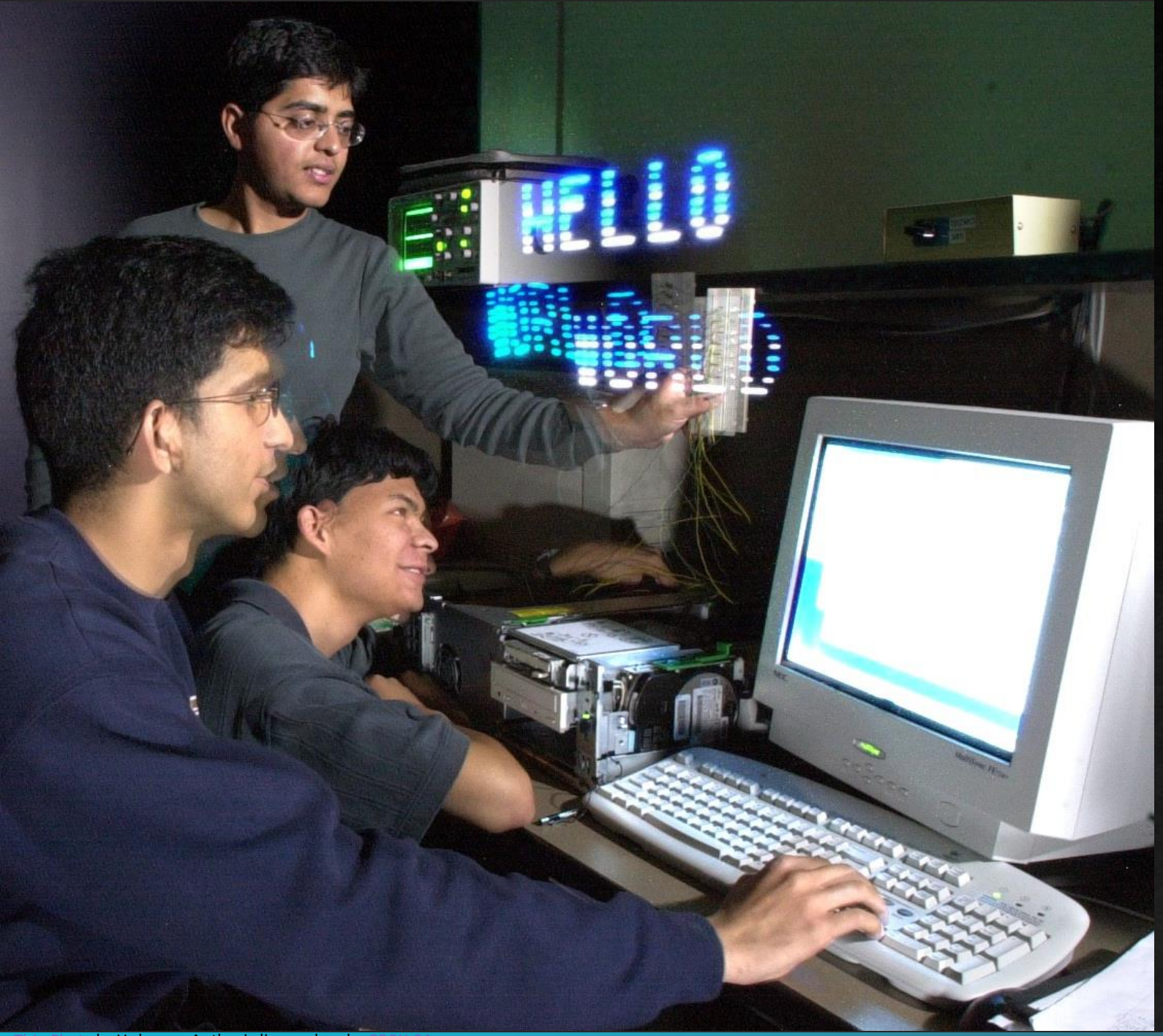


Introduction to Computer Programming

AnipSharma

Module Outcomes

After completing this module, you will be able to answer:

What is Computer Programming?

Why is it important?

What are its applications?

What are the opportunities in this field?

Computers!

- Computer is derived from the word “compute” which means to calculate.
- A computer
  - is used for general purpose
  - Is an electronic device
  - can perform arithmetic and logical operations automatically.
  - consists of a central processing unit and some form of memory.

Timeline of Computers

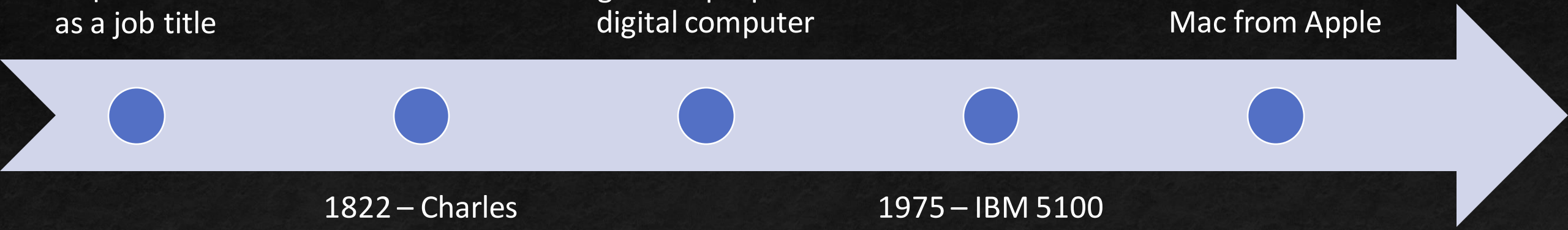
1613 – Word ‘computer’ used as a job title

1822 – Charles Babbage’s first Difference Engine

1945 – ENIAC – The first electronic general-purpose digital computer

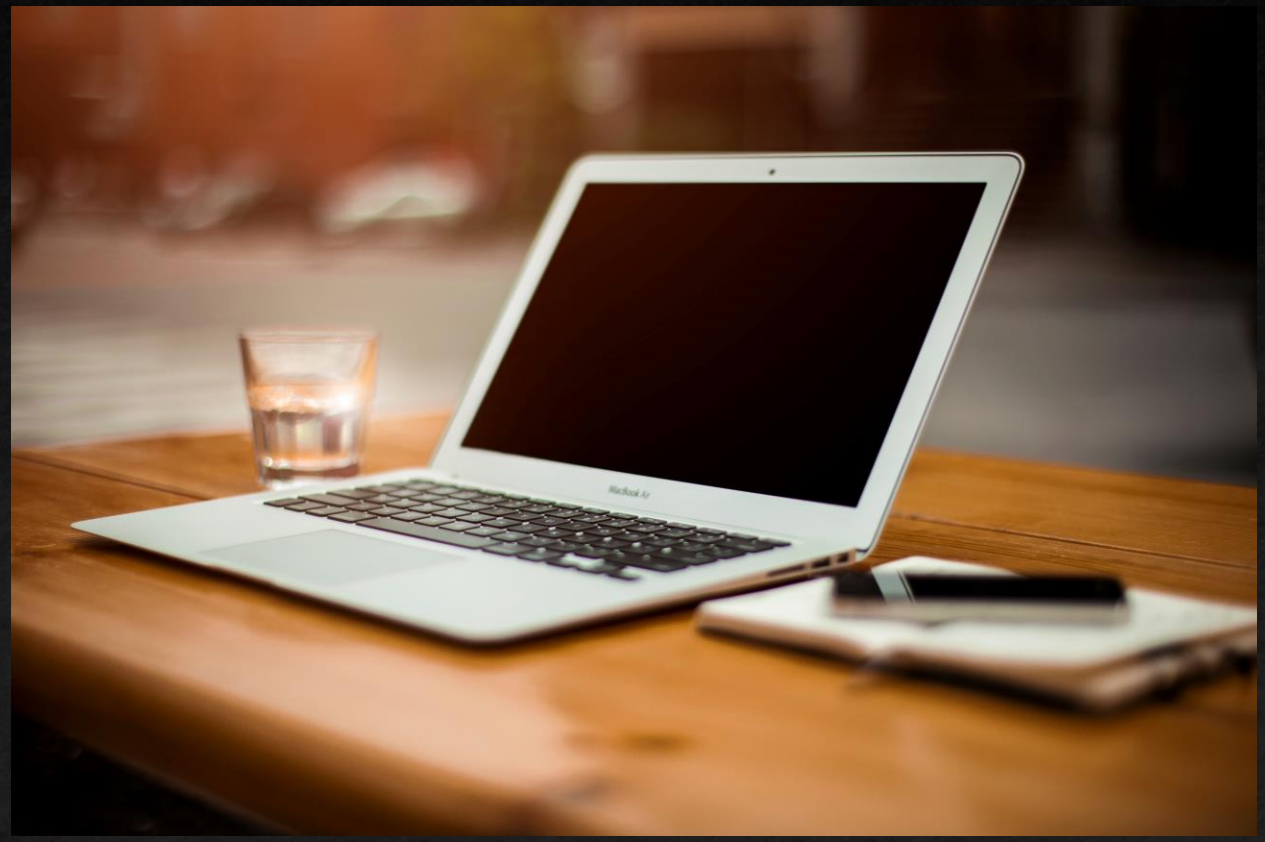
1975 – IBM 5100 first portable computer

1984 – The first Mac from Apple



Glossary of a Modern Computer

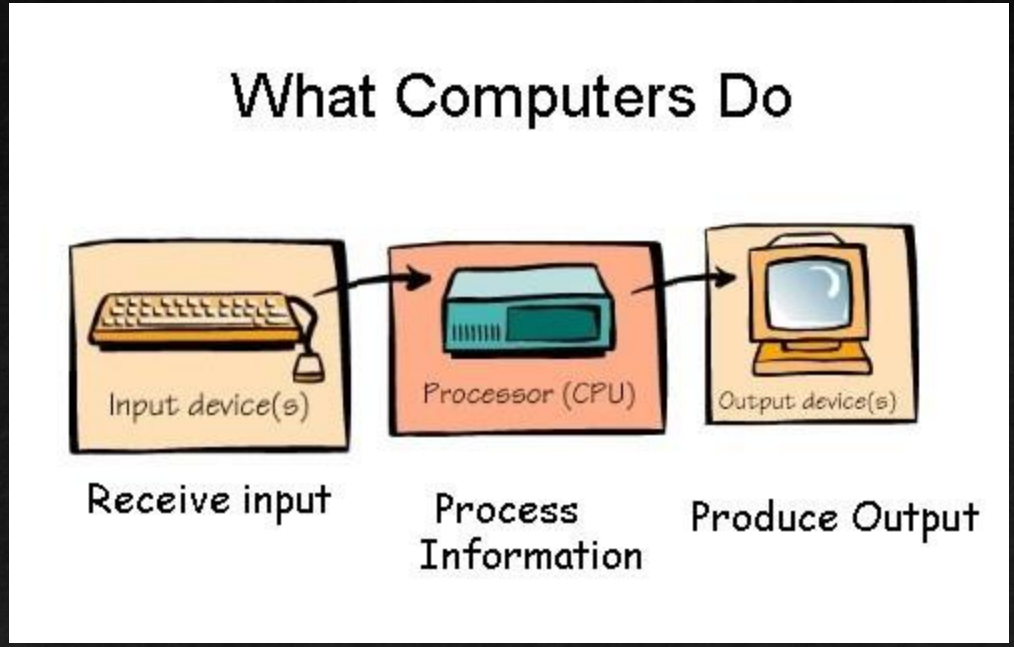
- Hardware
- Input Devices
- CPU
- Memory
- Output Devices
- Software
- Storage
- Speed
- Classification
- Data



How does a Computer work?

- Any digital computer carries out four functions in gross terms:

- Takes input
- Stores the input and instructions
- Processes the input
- Generates the output



Computer Instructions

- An instruction is an order given to a computer containing the steps to be executed.
- For a computer to know how to do anything, it must be provided instructions.
- A computer is given instructions by a human using a keyboard or another input device.
- Computers only understand machine code – a language made up of 0s & 1s.

Computer Program

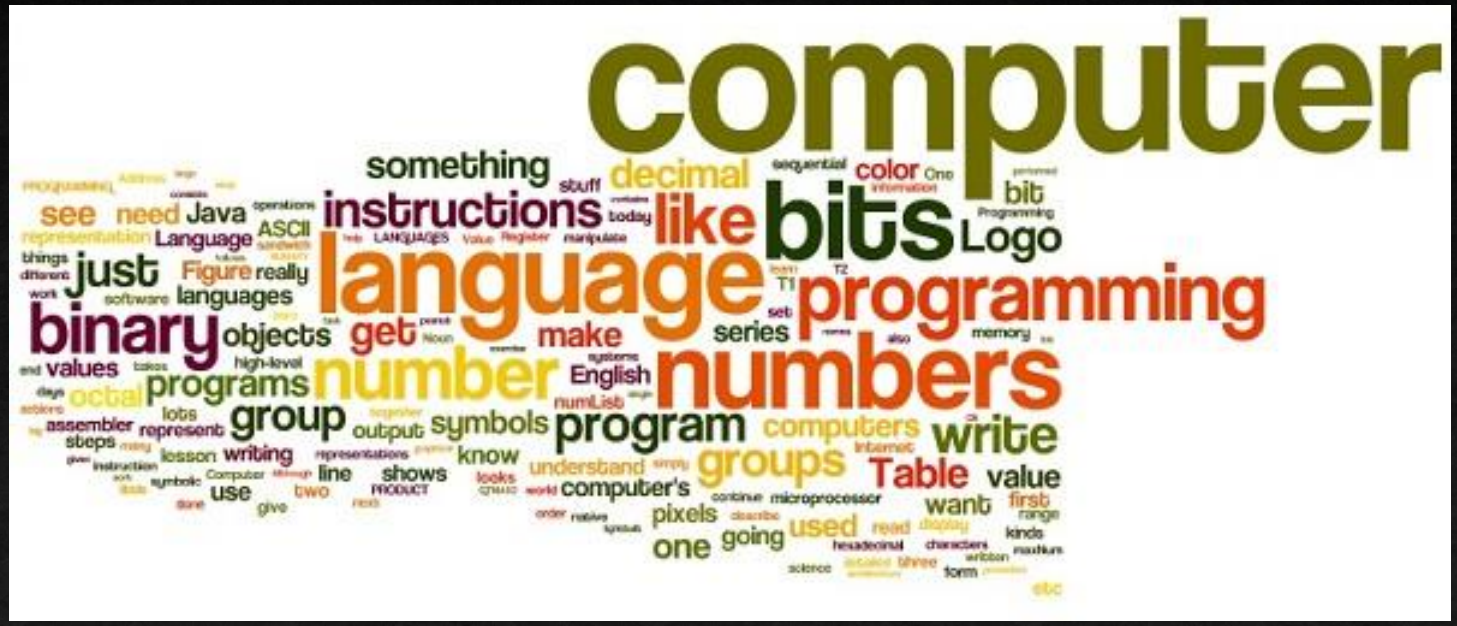
- A set of instructions for computer to facilitate specific actions is called a ‘Computer Program’.
- Computer Programming is how humans interact with computers.
- Underlying method used to arrange various instructions in a program is called an algorithm.
- A computer program is usually coded by a computer engineer in a ‘programming language’.
- The machine then converts the program into machine code.
- A collection of computer programs is referred to as software.

Summary till now

Here is what we learned:

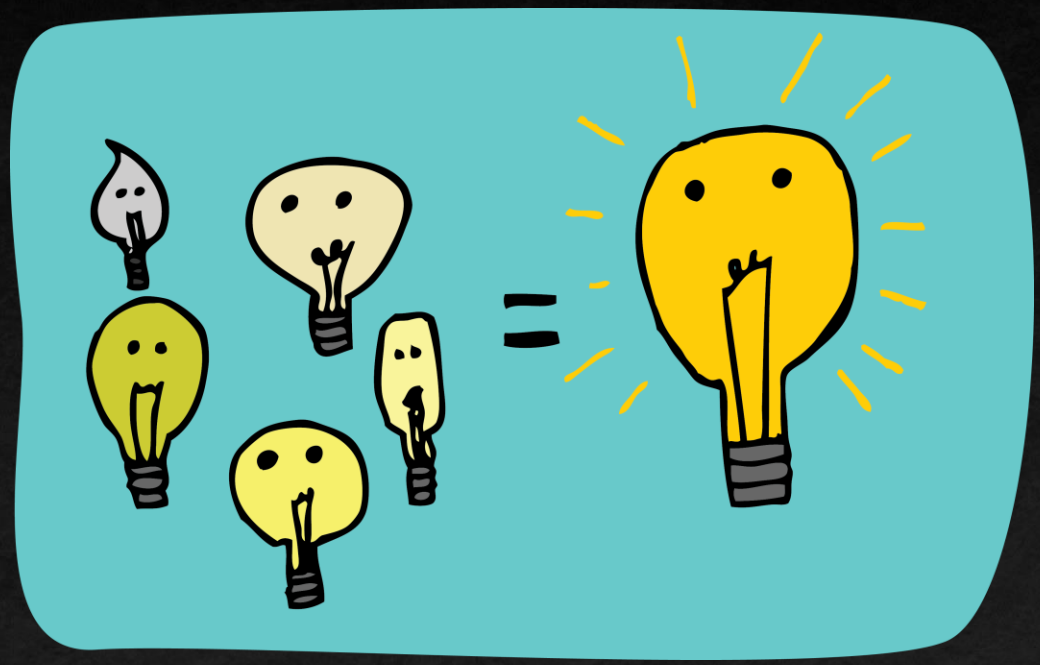
- **A computer is a general-purpose electronic device that performs arithmetic and logical operations**
- **Modern computers consists of hardware, software, input devices, output devices, and memory along with few other things.**
- **Any computer takes an input, processes it based on pre-defined instructions, and generates an output corresponding to that.**
- **An instruction tells the computer the task to be performed.**
- **A set of instructions is called a computer program, and a set of computer programs is called a computer software.**
- **Computer Programming is the way in which human beings talk to computers.**

Why is Coding important?



Coding helps in problem-solving

- Develop an appreciation of how things work.
- Use mathematics in order to solve problems in a logical and creative way.
- These skills should be learnt at a young age.



Coding develops resilience

- Develop an ability to bounce back after failure.
- Understand that failure can serve as a positive learning
- Learn that ‘debugging’ the code is half the fun.

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Coding teaches children how to think

- Computer programming isn't just about teaching how to type lines of code but about how to think differently.
- Understand how to break down a larger problem into smaller pieces.
- Learn how to take a vague idea and turn it into something effective.
- If the first solution doesn't work, they try another one. If that one doesn't work, they try again until the problem is solved.
- This way of thinking is highly sought after.

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Coding expands creativity

- Coding teaches children to experiment.
- Gives confidence to be creative as they design something that is their own.
- The feedback involved in coding motivates kids a lot when they see the results along the way.
- Coding is very easy for kids to pickup and this brings in creative confidence in them.

Coding is the future

- Coding is an extremely important skill to possess when we look at how the world is progressing.
- More and more industries are adopting computer automation in their business.
- A child who learns how to code will have the advantage in life with more employment opportunities available to them in the future.
- People who can code are the future and are highly sought after in any industry.

Summary till now

Here is what we learned:

- **Coding helps in problem-solving.**
- **Coding develops resilience**
- **Coding teaches children how to think**
- **Coding expands creativity**
- **Coding is the future**

Module Outcomes

After completing this module, you will be able to answer:

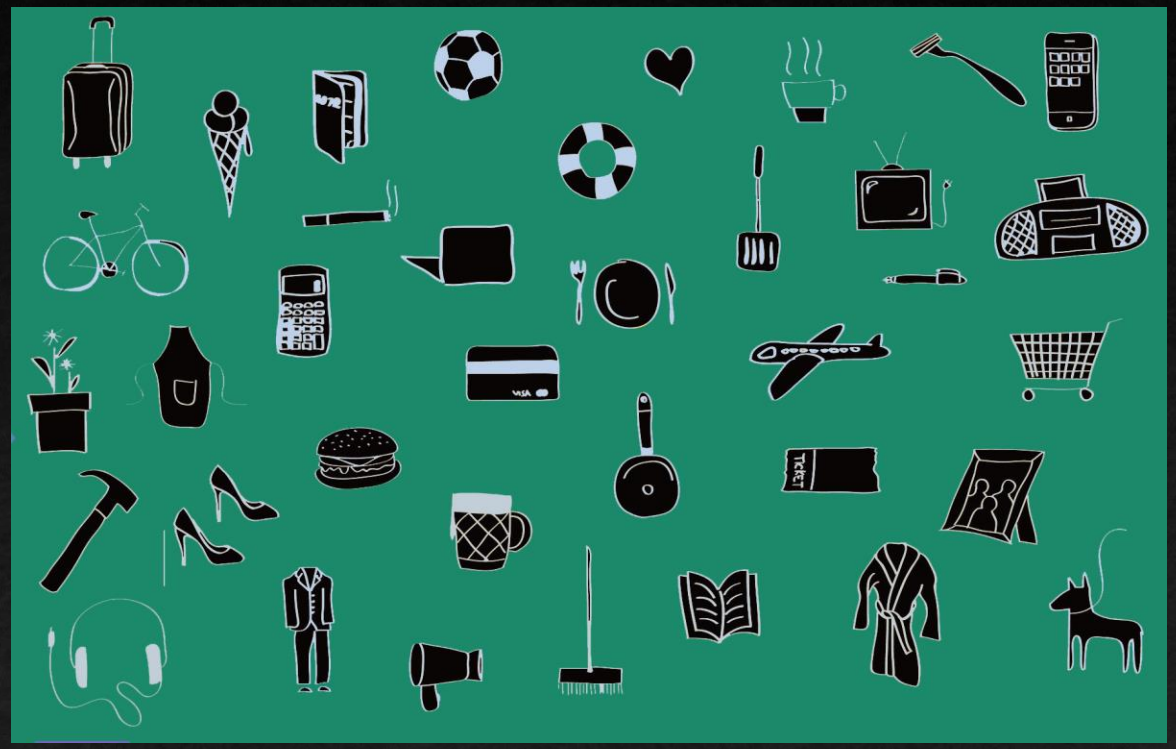
- What is Computer Programming?
- Why is it important?
- What are its applications?
- What are the opportunities in this field?

How Coding changed the world?

- Processing words – Grace Hopper
- Come on. It's E-mail! - MIT
- Conquering space - Margaret Hamilton
- A window to the world – Bill Gates
- Compressed photos -Joint Photographic Experts Group
- Organizing knowledge – Google

Coding around us

- Taking a hot shower
- Managing traffic
- Riding the elevator
- Doing laundary
- Calling your loved ones
- Watching television
- Driving to the grocery store



Our future with Coding

- Solve local problems
- Solve global problems
- Provide entertainment
- Make processes more efficient
- Predict future
- Automate tasks
- Contribute to Biotechnology
- Build intelligent machines
- Advance our understanding of space and the universe

What is possible with Coding?

- Web Development
- Game Development
- Scientific Applications
- Artificial Intelligence
- Application Softwares
- Image Processing applications
- Videos and animations
- Education and training

Career opportunities in Coding

- Software developer
- Artificial engineer
- Mobile developer
- Web developer
- Computer systems engineer
- Quality assurance engineer
- Instructional designer

What's next?

- Computational Thinking
  - Developing computational thinking
  - How to apply computational thinking?
  - Computational thinking and computer programming
- Hands-on Computer Programming
  - Visual computer programming
  - Decision making

Thank you!

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