Introduction to programming

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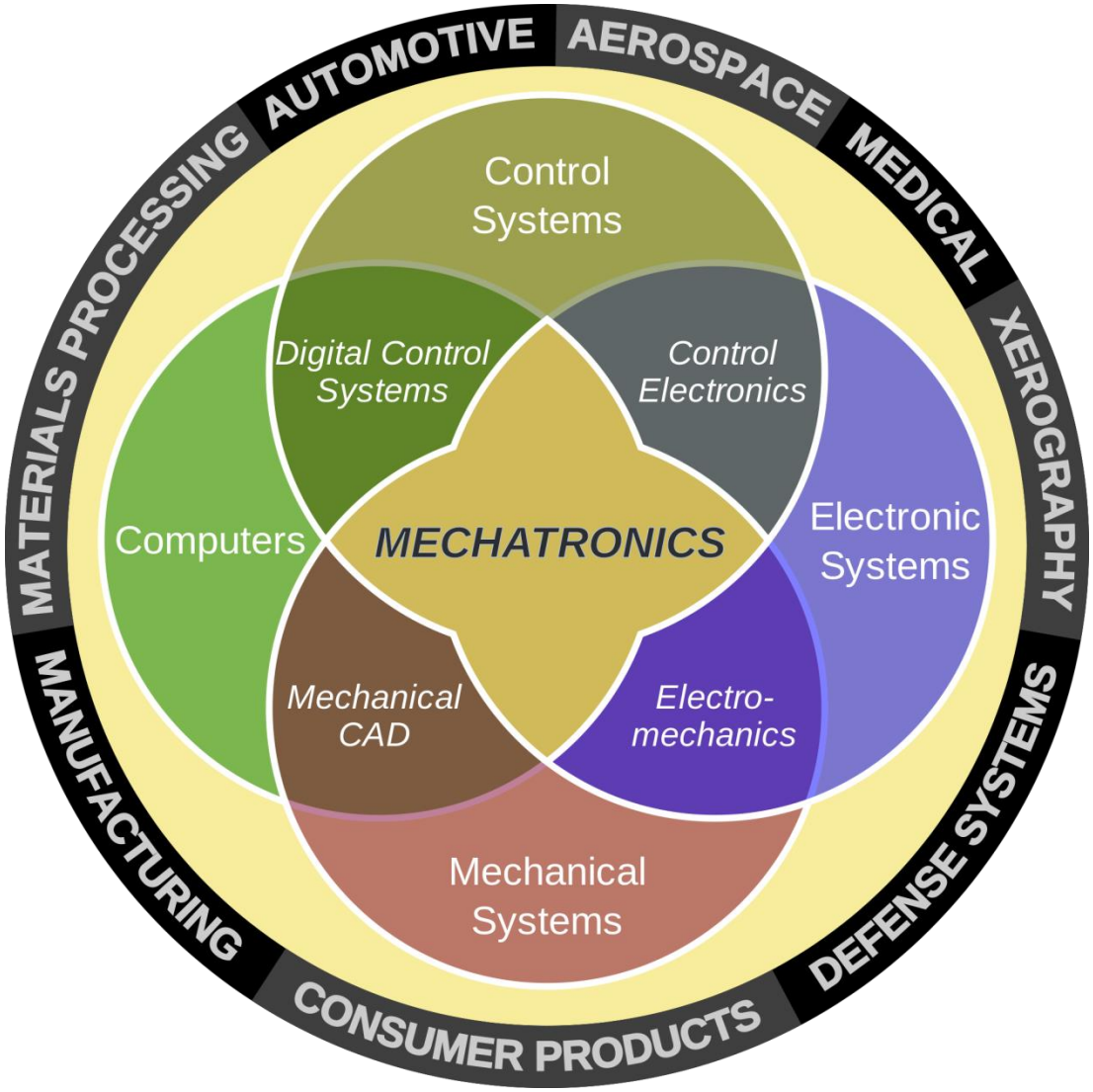
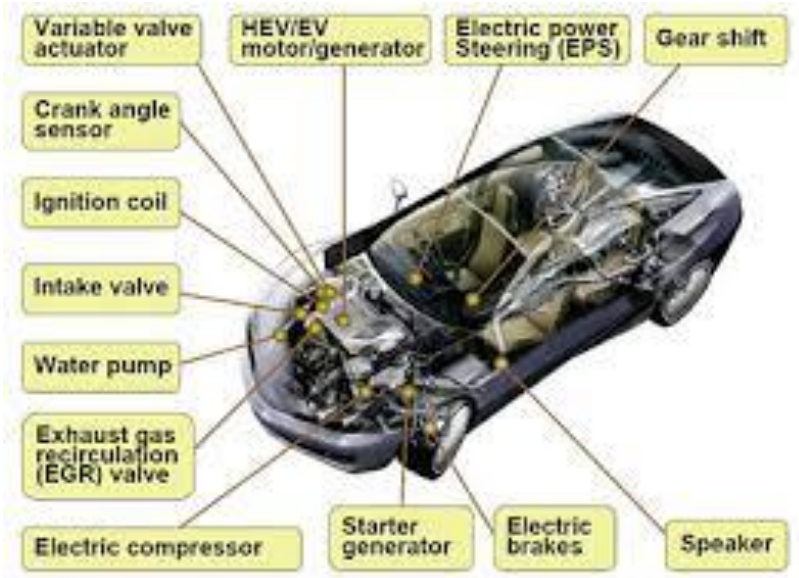
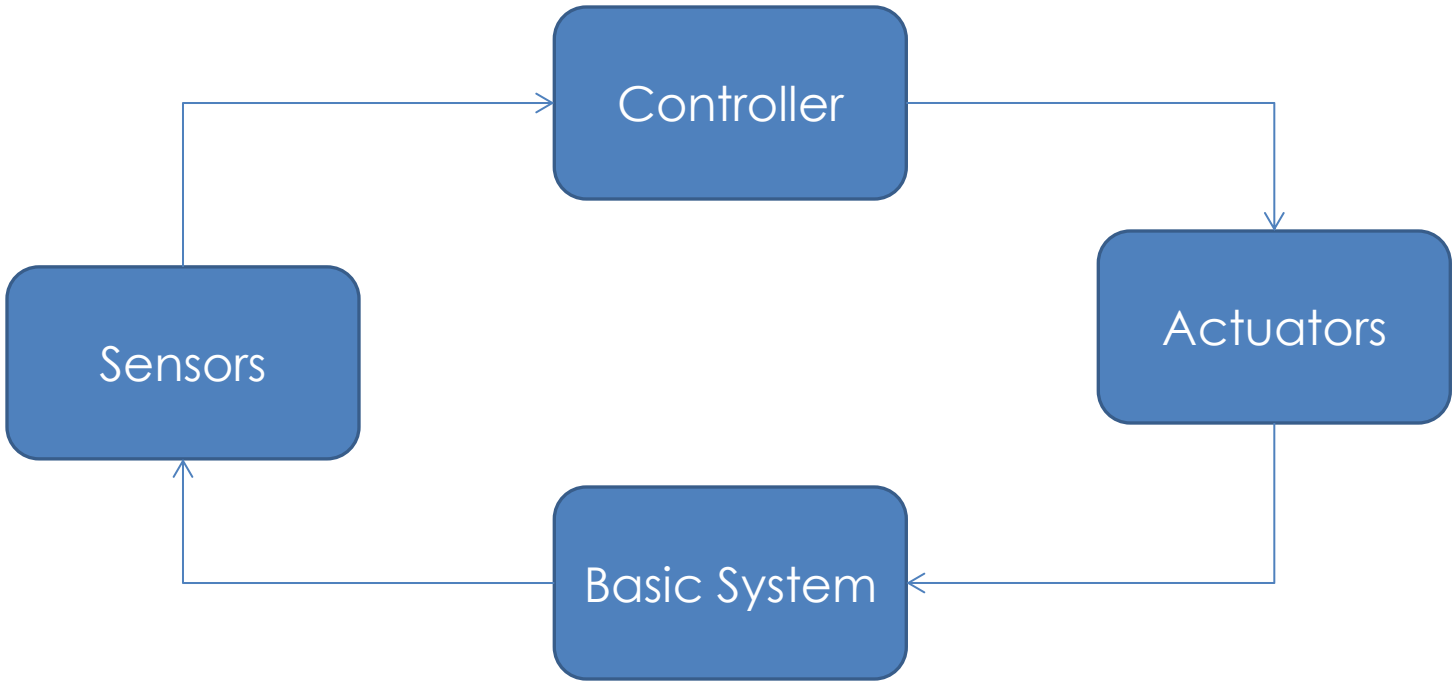

AUTOMOTIVE
AEROSPACE
MEDICAL
XEROGRAPHY
DEFENSE SYSTEMS
CONSUMER PRODUCTS
MANUFACTURING
MATERIALS PROCESSING
Control Systems
Digital Control Systems
Control Electronics
Computers
MECHATRONICS
Electronic Systems
Mechanical CAD
Electro-mechanics
Mechanical Systems

Mechatronics applications



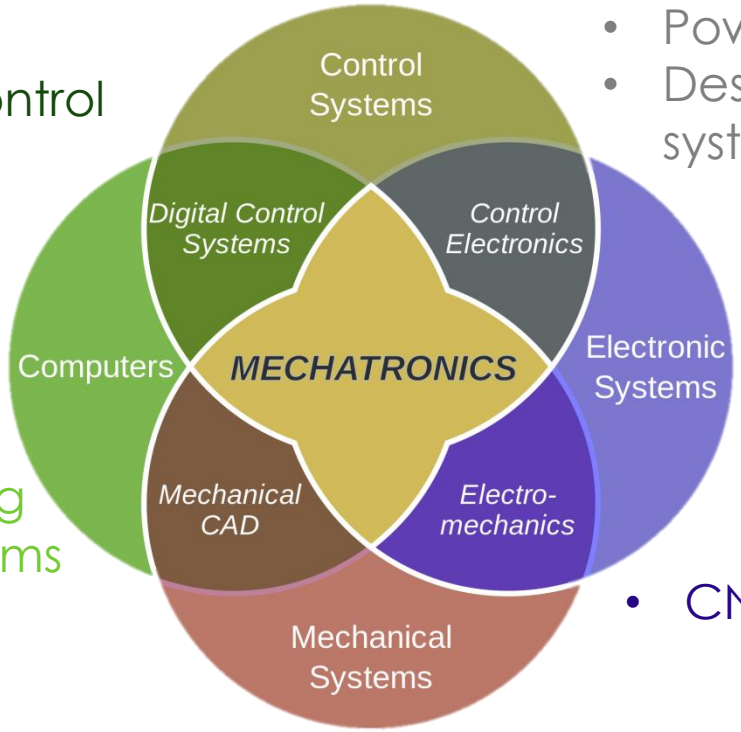
Mechatronics applications


Controller
Sensors
Actuators
Basic System

- Modeling & simulation
- Automatic control
- Mechatronics

- Power Electronics
- Design of Measurement systems

- Digital control



- Digital Design
- Programming
- Computer organization
- Micro-controller
- Image processing
- Embedded systems
- Robotics

- Electronics
- Electronic circuits
- Electronics of
- instrumentation

- CNC

M/C Design 2
Hydraulics and Pneumatics

Agenda

- Introduction
- Why should I learn programming?
- Which language should I learn?
- Why C/C++?
- What do I need to write a program?

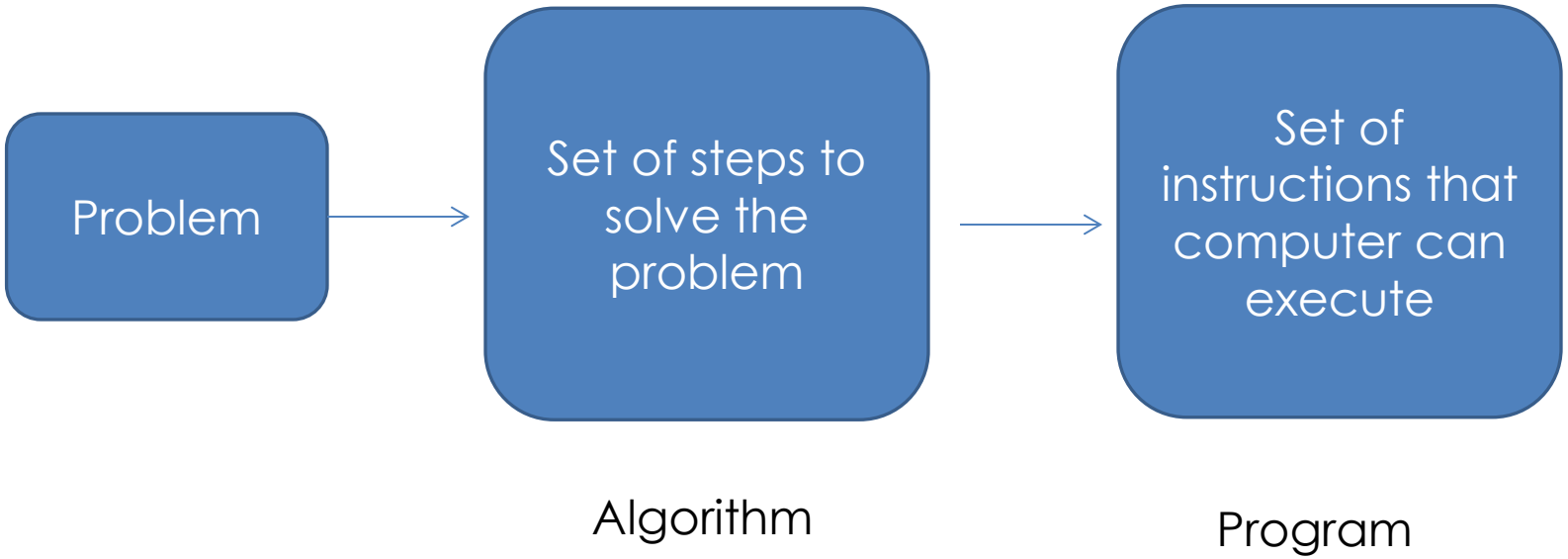
Introduction

- As we are in the computer age we tend to use computers in solving problems and making thing done.
- What does a computer can do?
  - It can do mathematical operations at very fast speed.
  - It can store data.

Introduction

- In order to use the computer to solve problems, We need to transform this problem to certain steps that a computer can perform.
- These number of steps that describes a problem solution is called an Algorithm.
- Transforming this steps into instructions that computers can understand and execute is what's called **programming**

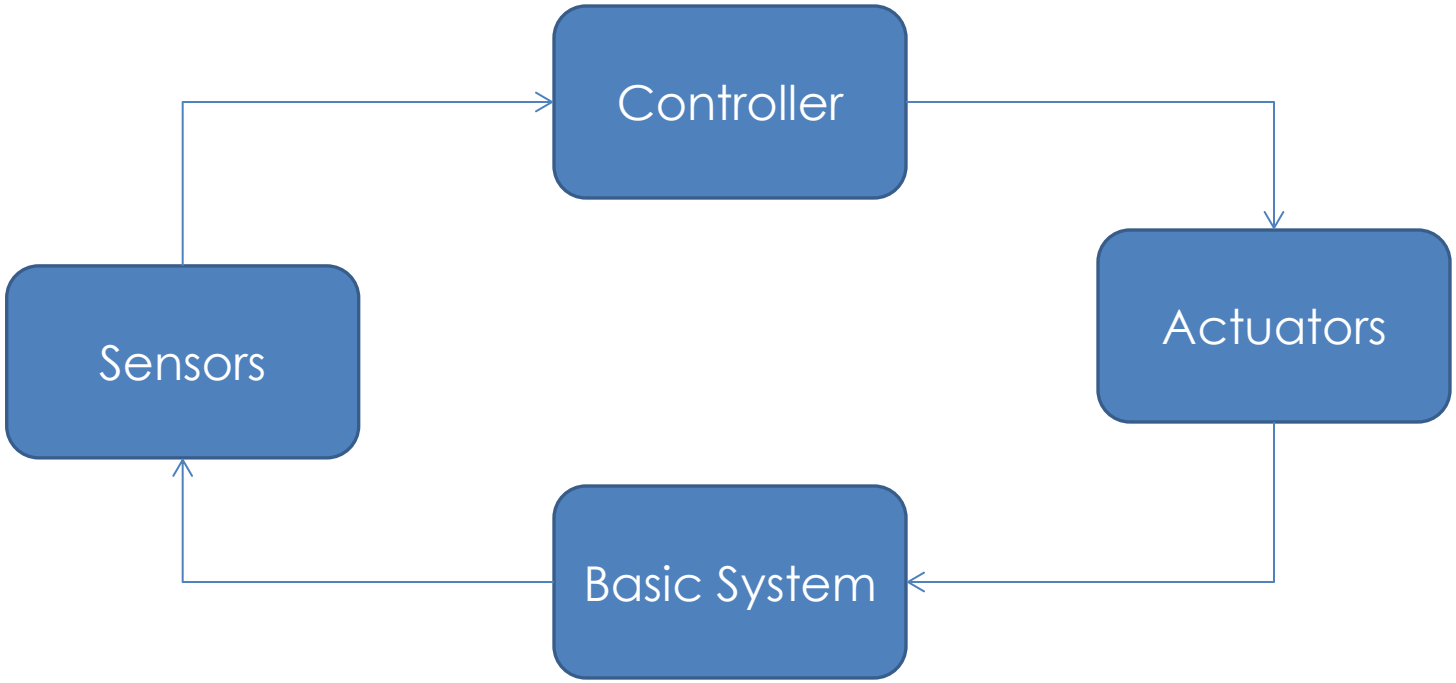
Introduction



Why I should learn programming? (as an Engineer)

- To interact with machines and computers
- To use the power of computing in all human hard work.
- To automate tasks.
- To create intelligent machines , etc.

Programming in the mechatronic system



Why I should learn programming? (as a human)

- "Every one in this country should learn how to program a computer because it teaches you how to think" --**Steve Jobs**
- "Don't just buy a new video game, make one
  Don't download latest app, help design it.
  Don't just play on your smart phone, program it" --**B. Obama**(Video)

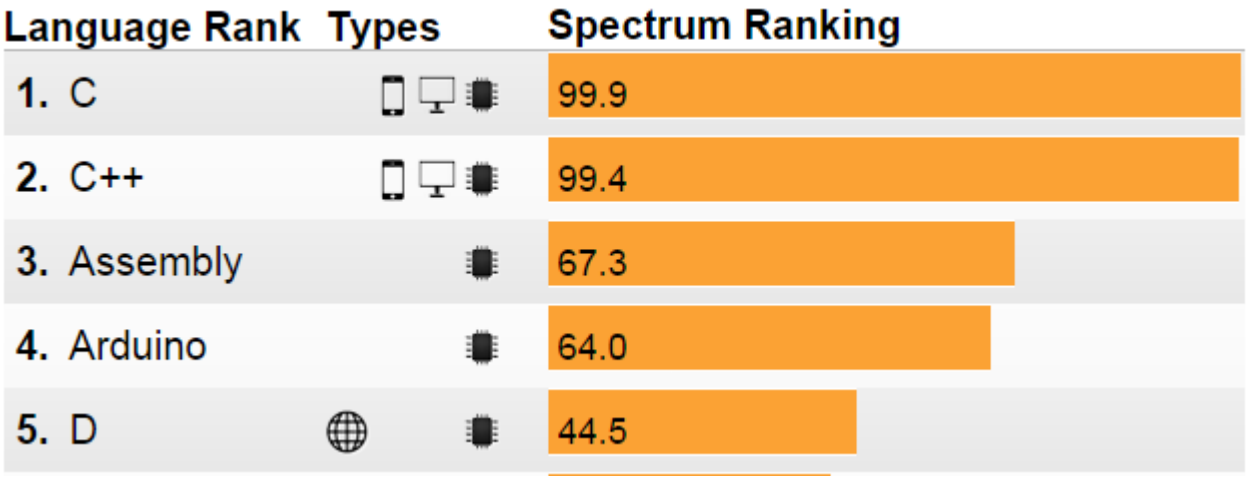
Which programming language should I choose?

- Almost all programming languages share the same programming concepts.
- Focusing on the understanding of programming concepts comes on the first place.

- We chose **C\C++** to be your learning language.

Why C/C++?

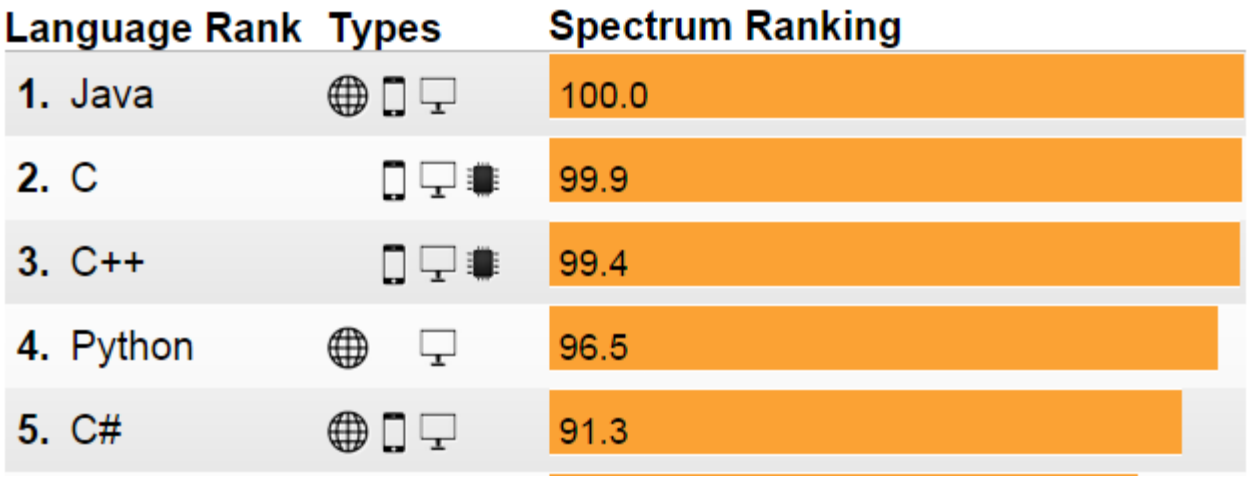
- C/C++ are the most commonly used languages in embedded system programming



Ranking is according to ieee spectrum here 2015

Why C/C++?

- C/C++ are top ranked languages in desktop applications and scientific applications



Ranking is according to ieee spectrum here 2015

Why C/C++?

- Major parts of the Windows, Unix and Linux are still written in C. So if you want program these OS or create your own you need to know C.
- When ever it comes to performance (speed of execution), C is unbeatable.

Why C/C++? Companies uses C

What do I need to write a program?

- The minimum requirements to write a program are:
  - Editor: Used to write text & format it.
  - Compiler: Is a program that convert C/C++ program to executable machine code.

- Examples for Editors:

Plain text Editors

Notepad

Wordpad

Text Editors

Notepad++

Sublime text

```
int main(){
cout<<"Hello World!";
}
```

```
1  int main(){
2  cout<<"hello world";
3  }
```

- Examples for Compilers
  - GCC
  - Clang
  - Microsoft compiler

Integrated development environment (IDE)

- It's a program that contains editor, compiler along with other features needed for development.
- Examples

Codelite

IDE multiplataforma para C/C++