Introduction to Webots

What is Webots?

- Webots is a program that can simulate robots.
- It contains a physics engine so we can simulate gravity, friction, wind, etc.
- We can see how our robots move in real time.
- It contains many commercial robots to try out.
- We can add obstacles and harsh terrains.

How can we learn Webots?

- The best place to start is the official Webots documentation found here: https://cyberbotics.com/doc/guide/tutorials
- We will try to go through it quickly, but it can always be used as a reference.

Let's start

1. Create a new world.
2. Use the mouse to move around the camera around.
3. Use tooltips.
4. Add an E-Puck robot.
5. Scene tree
6. Run the simulation

Controllers

1. Create a new controller
2. Print something
3. Add the controller to the robot
4. Refer to webots documentation
5. Import modules and specify timestep
6. Get motor objects
7. Move robot
8. Get sensor objects

Using PyCharm

1. Install PyCharm
2. Open controller folder
3. Add Webots API to the project

Using a receiver

```python
receiver = robot.getDevice("receiver")

receiver.enable(10)

while receiver.getQueueLength() > 0:

    print(receiver.getData().decode('utf-8'))

    receiver.nextPacket()
```

JSON

- JSON stands for Javascript Object Notation.
- Easy way to store data in files and transfer data.
- Key - value pairs, similar to Python Dictionaries.