**PROTOCOLS:**

UART:

Universal Asynchronous Receiver/Transmitter. It is NOT a protocol.

Main purpose is to send and receive data.

Data is transmitted in serial form.

A common example would be the Tx and Rx pins of an Arduino, which can be used to send and receive data respectively.

SPI:

Serial Peripheral Interface

Devices communicating via SPI are in a master-slave relationship. The master is the controlling device (Arduino) while the slave (such as a sensor or another Arduino) takes instruction from the master.

It is synchronous

[Arduino SPI reference](https://www.arduino.cc/en/reference/SPI)

I2C:

Inter IC

The I2C protocol involves using two lines to send and receive data: a serial clock pin (SCL) that the Arduino Master board pulses at a regular interval, and a serial data pin (SDA) over which data is sent between the two devices.

I2C allows for each enabled device to have it’s own unique address, and since communication doesn’t happen simultaneously(master and slave devices take turns to communicate) , it is possible to communicate with many devices which using just 2 pins of the uC.

BLUETOOTH:

It is a wireless technology standard for exchanging data over short distances using short-wavelength UHF radio waves.

HC-05 bluetooth module is widely used with Arduino.

[CODE](https://github.com/kanishrastogi/Technocrats-Tasks/blob/master/Bluetooth%20Bot/btbot.ino) (1st Yr Bluetooth maze bot task)

RF – Radio Frequency

LoRa – Long Range

**PS2 Controller:**

It has 12 analog keys, 5 digital keys and 2 analog joysticks.

PS2 Controller Receiver pins:

* + - Data: master line for sending data to slave (MOSI)
    - Command: slave line for sending data to master (MISO)
    - Vibration: vibration motors supply; 7.2 volts to 9 volts
    - Ground: circuits ground
    - VCC: circuits supply; 3.3 volts
    - Attention: CS or Chip Select pin for calling slave and preparing the connection
    - Clock: equivalent to SCK pin for clock
    - No Connection: useless
    - Acknowledge: acknowledge signal from the controller to PS2 receiver

PS2X LIBRARY:

Common functions:

ps2x.config\_gamepad(clock, command, attention, data, Pressures? Rumble?);

ready();

read\_gamepad(boolean motor1, byte motor2);

Button (but type);

To control a 4 wheel bot:

The movement + speed control can be mapped to the analog joysticks. One can control forward and back function while the other controls right and left turning.