

Answer to the question no - 1

- a) Brac can establish a secured fingerprint sensor connecting it with Arduino or Raspberry Pi.

An Arduino which is an open source microcontroller development board is able to read inputs from sensors and control things which can then interact with things in the real world. Moreover, Arduino software is easy to use for beginners yet flexible enough for advanced users which is inexpensive and open source extensive software. However Arduino is applicable for home automation also can be used in the above scenario of Brac fingerprint based entry system.

In addition to, Raspberry Pi is

also applicable in the above scenario.

There are some required components to implement this project.

b) The inductive sensor generates an electromagnetic field with the help of

electromagnetic coil having a metal detector

same as inductive but detect when

field is changes.

Answer to the question no - 2

a) In the above scenario, they are using SPI which stands for Serial Peripheral Interface and I²C.

Single master and multiple slave is SPI which is John's project and Jack's project which is multiple master and multiple slave is I²C.

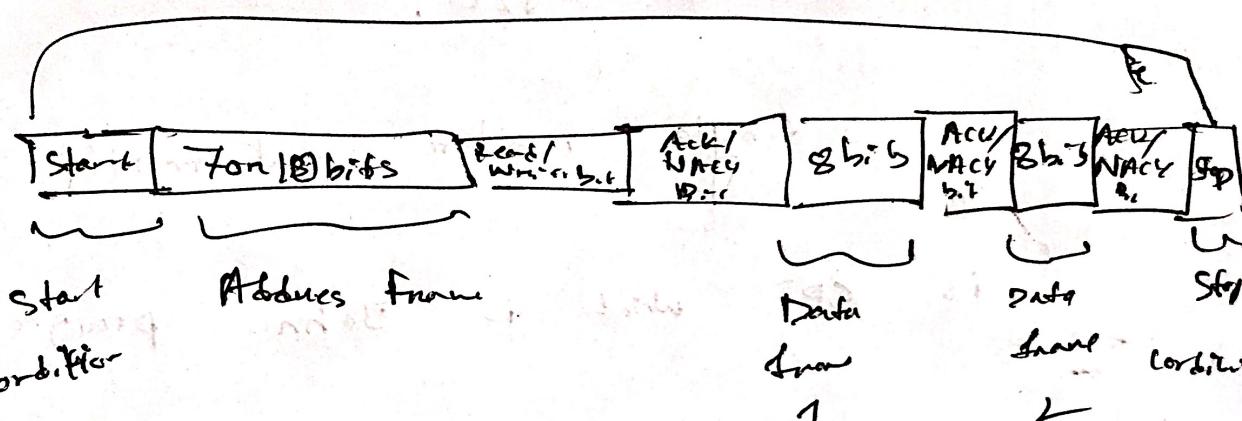
b) Jack is using I²C which is multiple master and multiple

slave. I²C is multi-master bus providing arbitration and collision detection.

I2C is broken into frames of data which contains binary data

also include start and stop condition

Message



c) John is using SPI communication

protocol which advantages are as follows:

- ① Simple protocol hence not require processing overheads.
- ② supports full duplex communication
- ③ consume less power than I2C
- ④ Data can be transferred at high speed.

Disadvantages are:

- ① No flow control and no acknowledgement mechanism used in SPI
- ② Master and slave relationships mapped to the device can not be altered unlike I2C interface
- ③ Uses or CS line per slave hence more complex in design.

④ Adding slaves, extra as time require.

Answer to the question no - 3

a) I prefer to use DRAM between the magnetic disk and SSD for the above scenario.

Magnetic disks are very fast access to Data which is not portable. However, SSD's are faster than Hard disk and DRAM is more faster than SSD and is portable. That is why I use DRAM.

b)