Case Study [Biometric recognition]

Embedded system: Combination of hardware and software to perform dedicated task.

Biometric system: For identification and verification of an individual.

→ In conventional methods do not use attributes of individual.

→ They used pin number and passwords which are not secure.

→ In Biometric system, human features which are unique to everyone are considered.

- They cannot be lost, stolen or easily forgotten and can't be forged.
- They are secure.

Types of Biometric recognition:

1) **Physiological attributes:**
   - Face recognition
   - Finger print
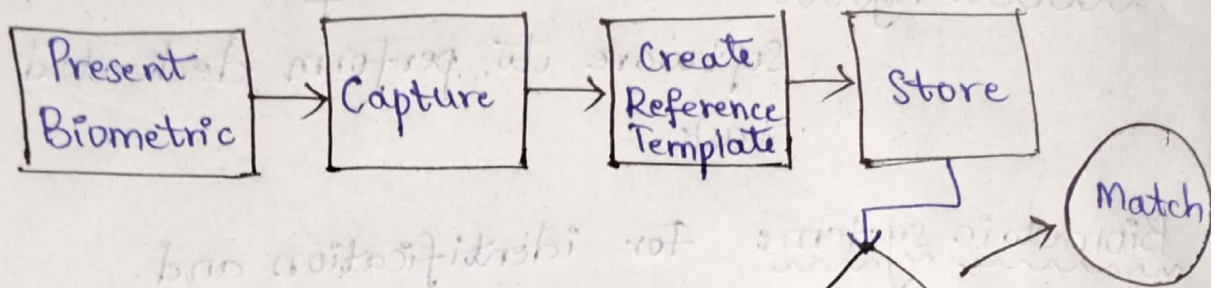   - Thumb
   - DNA
   - Iris

2) **Behavioral attributes:**
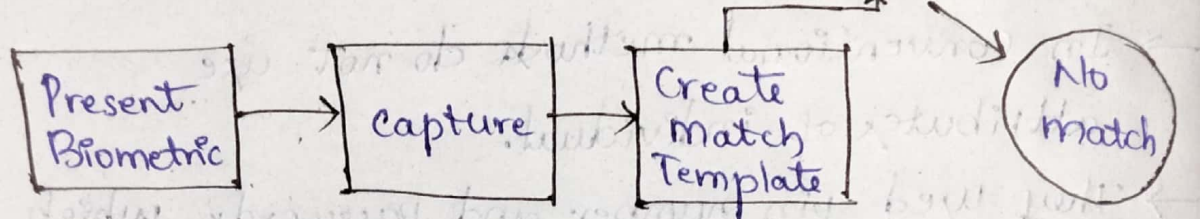   - Voice
   - Walking style.

Biometric system flow chart:

Enrollment

```
┌──────────┐     ┌─────────┐     ┌───────────┐     ┌────────┐
│ Present  │ ──→ │ Capture │ ──→ │ Create    │ ──→ │ Store  │
│ Biometric│     │         │     │ Reference │     │        │
└──────────┘     └─────────┘     │ Template  │     └────────┘
                                 └───────────┘
```

Verification

```
┌──────────┐     ┌─────────┐     ┌───────────┐
│ Present  │ ──→ │ Capture │ ──→ │ Create    │
│ Biometric│     │         │     │ Match     │
└──────────┘     └─────────┘     │ Template  │
                                 └───────────┘
```

Compare → Match / No match — Threshold

→ Capturing of biometric is performed by the hardware parts of the biometric system.

→ Creation of reference template and match template will be done by software part of the system.

→ Then, the system is going to compare it with a threshold value, if it is greater than threshold it considers as a match and marks the attendance.

→ If the value is less than threshold value, it considered as not matched, need to give biometric again.