

# Test Plan

## Load Testing

Load testing is a type of non-functional testing. A load test is type of software testing which is conducted to understand the **behavior of the application under a specific expected load**. Load testing is performed to determine a system's behavior under both normal and at peak conditions.

### What to test:

PHP server

### What we test:

What happens when huge data is sent into the php server by multiple nodes. Here we only have a single node implemented. So what we did was , as we know the largest size of data transferred into the server at once through a single node is calculated.

Assumption 500 class rooms in an large scale university. So 500 TCP requests were sent into the php server at same time.

### Input

Maximum of 500 TCP requests, at same time.

### Testing environment

Localhost server

### Tool used

<https://www.webperformance.com/php-load-testing/>

### Expected output

Storing the data in Mysql db in PHP server

## Results:

Php server didn't crashed due 500 TCP requests at once.

## Special remarks

This is not a kind of DoS attack. Here we assume that system is totally protected over DoS attacks. Using the above tool we gave access only upto three TCP requests within a given time period.

## Compatibility Testing

Compatibility Testing is a type of Software testing to check whether your software is capable of running on different hardware, operating systems, applications, network environments or Mobile devices.

According to data sheet the R307 finger print module

- Working environment: Temperature: -20 °C - +40 °C Relative humidity: 40% RH-85% RH (no condensation)
- Storage environment: Temperature: -40 °C - +85 °C Relative humidity: <85% H (no condensation)

Supply voltage: DC 4.2 ~ 6.0V (Supplying 5v would be ideal)

- Search time: <1.0 seconds (1: 1000 hours, mean value) . marking can be done under one second which would be suitable
- Fingerprint image input time: <0.3 seconds (Enrolling can be done twice of this size . i.e it will take 0.6 s to enroll a new user)

Range of esp-8266 wifi module 300m line-of-sight outdoors less than 10 metres

or less indoors if the signal needs to pass through 2 or 3 walls.

We can extend the range by using external antennas. But this range would be enough because a class room is not extended via 2-3 walls. Also the problem is solved when there are powerful wifi signals are available.

The Operating voltage of finger print module is also around 4.2 ~ 6.0V so with the use of the rechargeable battery we have to check the boundry value analysis to analyze it. We can conclude that 5v would be ideal.

### Input

Used two finger prints within time measured as 5ms

Enrolled two users within 5ms.

### Testing environment

Environmental factors matching values of data sheets

Working environment: Temperature: -20 °C - +40 °C Relative humidity: 40% RH-85% RH (no condensation).

Wifi enriched zone

### Expected output

LCD outputs as successfully enrolled two users.

### Results:

Finger print sensor identified as two users enrolled seperately

### Special remarks

Time will be more than 5ms when in practical scenarios. So the product will ensure safety.

## Integration Testing

Bottom-Up approach .Integration testing is a level of software testing where individual units are combined and tested as a group. The purpose of this level of testing is to expose faults in the interaction between integrated units.

Test cases,

Finger print

Just input taken and searched.

With network connectivity input taken and string is checked inside the database.

- When enrolling a student, fingerprint confirmation is matches with the original fingerprint.
- Searching for an student outputs the registration number of the student

## Functional Testing

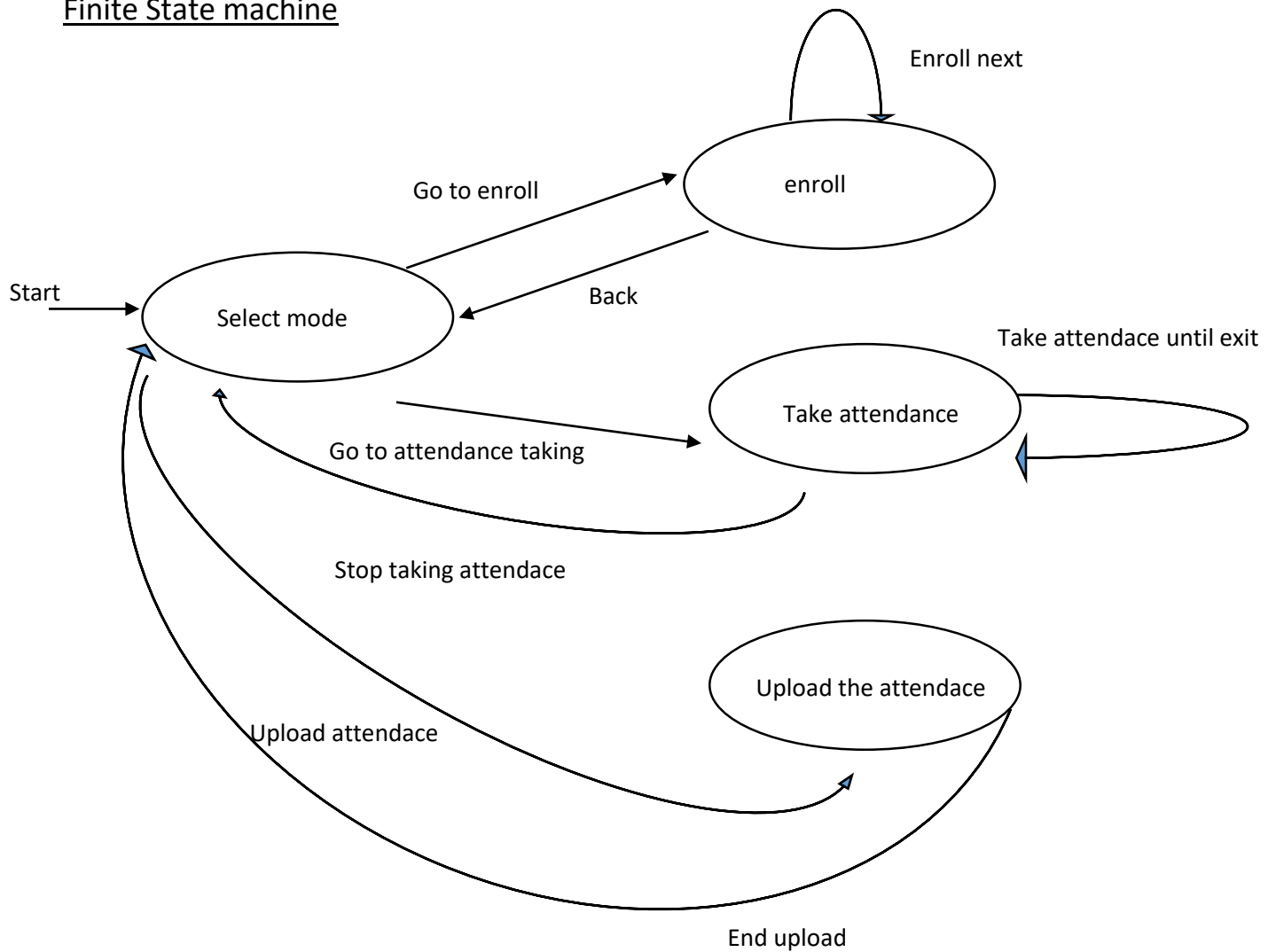
Functional testing is a type of software testing where by the **system is tested against the functional requirements/specifications**. Functions (or features) are tested by feeding them input and examining the output. Functional testing ensures that the requirements are properly satisfied by the application.

Here we divided the system into single units or functions and test each function whether it gives expected outputs. **Equivlance partitioning** is used which divides the input data of a software unit into **partitions** of **equivalent** data from which test cases can be derived.

### **Test cases,**

- When enrolling a student, his/her student details are entered into the database.
- Angular has capability of live server development. Therefore we can easily Test at each
- Update function should update the corresponding values in the database with respect to the given input through wifi.
- Give some known data to the uploading function and check whether the given data are stored in the database .

## Finite State machine



### What to test:

State machine of the embedded system

### What we test:

Provide input to each state and check to see if it goes to the next proper state.

### Input

Using key pad give the corresponding input. Ex –when in select mode state there are there inputs: enroll, search and upload

### Expected output

Go to the correct state when gives the input.