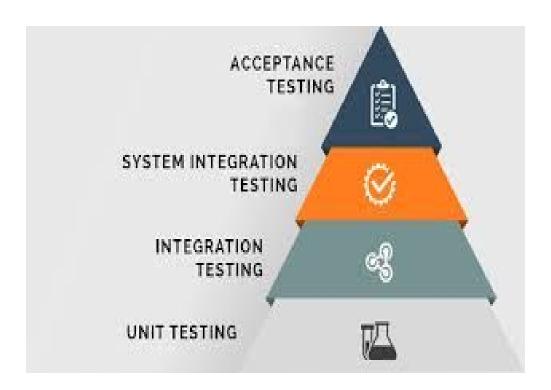# Software Testing Analysis

Unit Testing

While building each component(unit) of the project we aggressively test and change our component for quicker results. This is extremely important as the units are the building blocks of the whole project and any bug in them could cause the whole system to fail as each component will be used in many parts of the project. Initially all the API calls were tested then we focussed more on the individual parts in the frontend, like the rankings part, leakage detection, etc. We gave dummy data to simulate leakages and NRW values.

This is known as the white box testing testing technique where we, the developers go through each component and look at the code and try to fix bugs hence the name "white box".

Integration Testing

Integration testing is done to test the modules/components when integrated to verify that they work as expected i.e. to test the modules which are working fine individually and do not have issues when integrated. To conduct integration testing we follow mostly the bottom up integration where we keep on joining components as we build them. This seemed to best fit the way we had built the product as we were continuously building our components and linking it to the lower level modules. We did not try big bang testing as we did not build our product at once. For things like checking leakages we used a top down approach because we had to build the whole project and update database values to check for leakages and all related functionalities like display of leakage values, highlighting of the location, etc. We don't really use a sandwich testing approach as we try to test a part based on how it is built so for each part we use either a top down approach or a bottom up one but mostly not both.

System Testing

Here we test the product as a whole. So we went through all the flows through the eyes of a user for separate use cases like leakage depiction, data analysis, etc and tried to find errors in each flow. We go through the web app and go through different functionalities like login, seeing rankings, etc as if we were a user. Since we the developers know about the product and its underlying code but we are testing by using the user's point of view this approach is called gray box testing.

Acceptance Testing

Acceptance is the highest level of testing where the clients and testers take the whole product as a black box and check for issues in the functioning and usability. Most of the issues are in the usability and interface design as functionalities would already have been tested by then. We mostly focus on ease of use and design in this stage. So through a demo we showed our client our product and the client decided whether the product is fit for the

target audience. This is a black box testing as the client does not know the underlying code.