Testing

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In software engineering, we build a lot of codes for solving different type of problems. Every problem is different in nature and has got a lot of corner cases.

Example: We are building an ecommerce application, and we are building the cart functionality viz adding or removing products from cart. So few corner cases here can be, what if the customer add a product twice but removes it thrice ?

It becomes very tedious to test manually every feature that we are building and check whether your program works fine for all the features and cases.

That is why testing comes into the picture. The concept of testing our application expands the horizon for us as developers to not only test our application manually, but instead before we even start writing our feature, we can think of the possible corner cases and then we can start building the application so that whenever we add new piece of code to our feature, the corner cases for that piece of code are already loaded in the system and we can then immediately test it.

This references to something called as TDD (Test driven development).

So TDD enforces that before we start writing our code, we can think of the corner cases and load them as tests in the system and then step by step write our feature and with each step we resolve few corner cases.

Software testing is as much important as Software development, and always walk along with development.

Different types of testing:

- `Manual Testing`: In manual test we try to run our feature manually and then check all the possible corner cases. Manual testing is important because it gives you the perspective of a user that how the user will feel about the feature when they will actually use it.
- `Unit Testing`: Here we focus on the smallest unit of code. The word UNIT in Unit testing refers to the smallest unit of code. The smallest unit of code can be a function of may be inside a function a for loop or conditional etc. So in unit testing all the testing will be performed by checking the corner cases for the small units of code. Even if we have a conditional like `if-else` then that can also lead to two different outputs. So both the branches should be tested separately.
- `Integration Testing`: Here we take multiple small units and combine them to create a small working component and then test the component.

The above listed different types of testing were on the basis of nature of testing.

We can distinguish testing based on release also.

- `Alpha testing`: It is a type of testing to ensure the product is ready to go to public. Here the developers test the application in depth before they start rolling out the software for anyone. It is kind of like in house testing, no body apart from the project contributes to the testing.
- `Beta Testing`: This type of testing is done after alpha testing and before the final release of the feature to all over the globe. In Beta testing, we enroll few users for using the beta version of our application and then receive feedback.

Based on application performance also we can do testing

- `System Testing`: This testing is done to check if the software works fine with most of the operating systems or not ? It will not see internal working of the software by just compatibility but instead manually do the tests.
- `Stress Testing` : In this kind of a testing we try to break our application in every possible manner and then see whether the application survives it or not ?
- `Performance testing`: We check the speed and interactivity and responsiveness of the application.

JEST

```
npm i jest
```

Use the above command to install Jest.