React Native Unit Testing

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GOALS

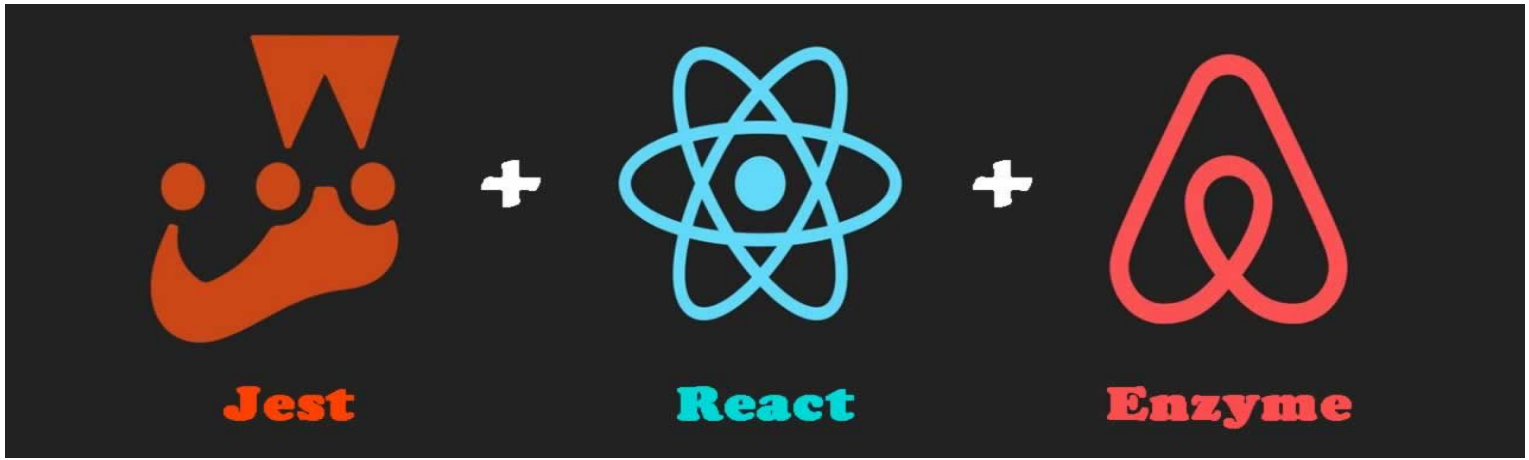
1. Intro about Unit Testing
2. Implementation Jest

1. Intro about Unit Testing

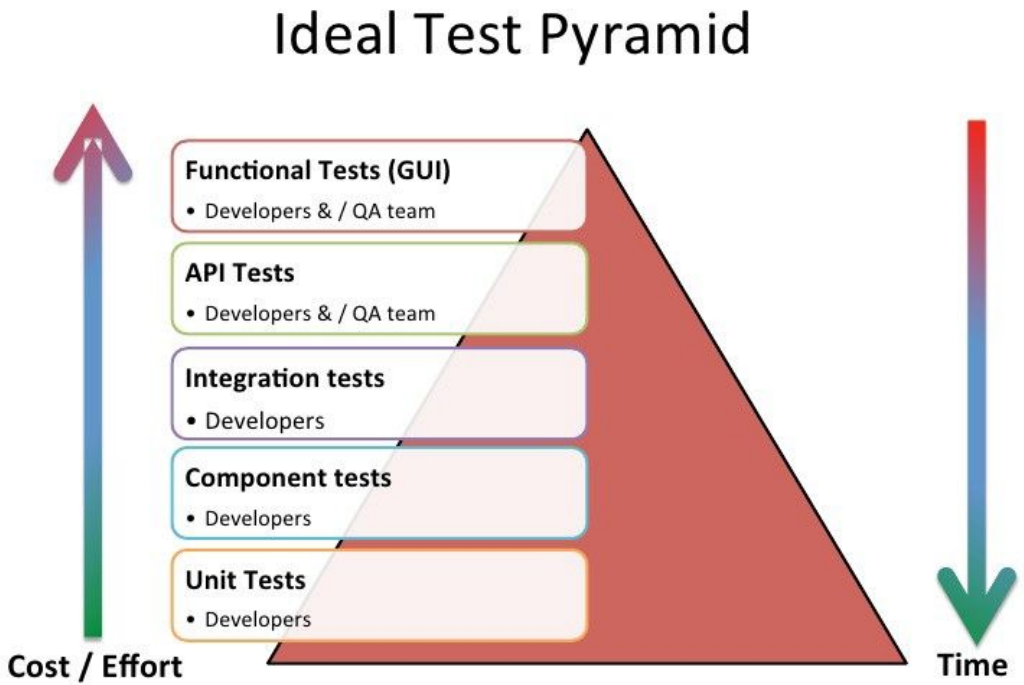
Unit testing is the first line of defence for your codebase and is key to a healthy and maintainable app.

If you don’t like testing your product, most likely your customers won’t like to test it either. — Grasshopper

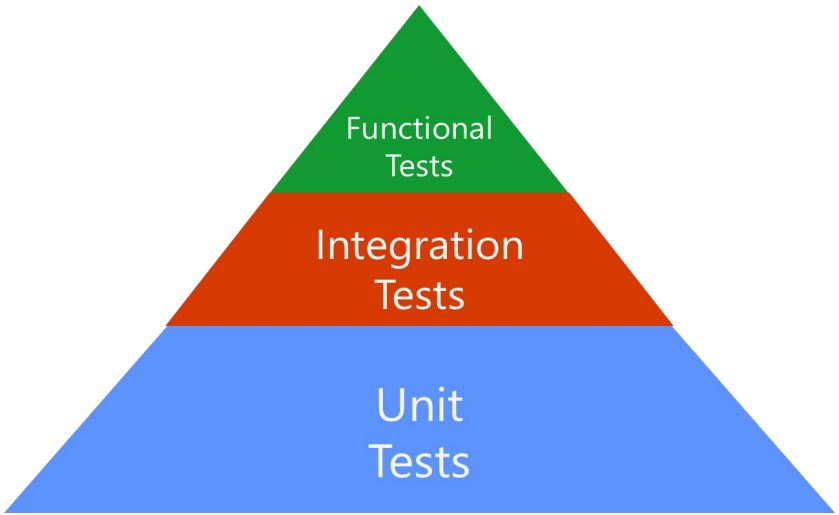
Unit Testing | Tools x Frameworks



Testing | Types



Testing | Types



Redefining a function specifically for a test to generate a result. Example: returning hard-coded data instead of relying on fetch requests or database calls. Mock functions can be defined in jest with jest.fn(() => { //function here });

Testing a multitude of functions working together, or an entire React component including children components. Example: Enzyme's mount()

Testing one isolated function, or one React component. Example: Enzyme's shallow()

Benefits?

- Quality of Code
- Provide Documentation
- Debugging Process
- Unit Testing on your resume
- etc..

Assertion

When you're writing tests, you often need to check that values meet certain conditions. Expect gives you access to a number of "matchers" that let you validate different things.

```
test('the best flavor is grapefruit', () => {
  expect(bestLaCroixFlavor()).toBe('grapefruit');
});
```

Example: Assertion

```
// File name: sum.js
export function sum(a, b) {
  return a + b;
}
```

```
// File name: __tests__/App-test.js
import {sum} from '../sum';

test('adds 1 + 2 to equal 3', () => {
  expect(sum(1, 2)).toBe(3);
});
```

2. Implementation Jest

- **Example: Repeating Setup For Many Tests**

```
beforeEach(() => {
  initializeCityDatabase();
});

afterEach(() => {
  clearCityDatabase();
});

test('city database has Vienna', () => {
  expect(isCity('Vienna')).toBeTruthy();
});

test('city database has San Juan', () => {
  expect(isCity('San Juan')).toBeTruthy();
});
```

- Example: One Time Setup

```
beforeAll(() => {
  return initializeCityDatabase();
});

afterAll(() => {
  return clearCityDatabase();
});

test('city database has Vienna', () => {
  expect(isCity('Vienna')).toBeTruthy();
});

test('city database has San Juan', () => {
  expect(isCity('San Juan')).toBeTruthy();
});
```

- Example: Another way

```
// Applies to all tests in this file
beforeEach(() => {
  return initializeCityDatabase();
});



describe('matching cities to foods', () => {
  // Applies only to tests in this describe block
  beforeEach(() => {
    return initializeFoodDatabase();
  });

  test('Vienna <3 sausage', () => {
    expect(isValidCityFoodPair('Vienna', 'Wiener Schnitzel')).toBe(true);
  });

  test('San Juan <3 plantains', () => {
    expect(isValidCityFoodPair('San Juan', 'Mofongo')).toBe(true);
  });
});
```

Sample Coding

Install!

```
npm install jest-environment-enzyme jest-enzyme
enzyme-adapter-react-16 react-dom enzyme
--save-dev
```

./package.json (cari bagian jest)

```
"jest": {
   "preset": "react-native",
   "collectCoverage": true,
   "setupFilesAfterEnv": ["jest-enzyme"],
   "testEnvironment": "enzyme",
   "testEnvironmentOptions": {
     "enzymeAdapter": "react16"
   }
 }
```

./src/components/Button.js

```
import React from 'react'
import { Text, TouchableOpacity } from 'react-native'

const Button = props => {
 const {buttonStyle, textStyle} = styles;
 const {onPress, label} = props;
 return (
   <TouchableOpacity onPress={onPress} style={buttonStyle}>
     <Text style={textStyle}>test label</Text>
   </TouchableOpacity>
 );
};
```

```
const styles = {
 textStyle: {
   alignSelf: 'center',
   color: '#fff',
   fontSize: 16,
   fontWeight: '600',
 },
 buttonStyle: {
   height: 45,
   alignSelf: 'stretch',
   justifyContent: 'center',
   backgroundColor: '#38ba7d',
   borderBottomWidth: 6,
   borderBottomColor: '#1e6343',
   borderWidth: 1,
   marginLeft: 15,
   marginRight: 15,
 },
};

export default Button;
```

./__test__/button.test.js

```
import React from 'react';
import {shallow} from 'enzyme';
import Button from '../src/component/Button';
import Enzyme from 'enzyme';
import Adapter from 'enzyme-adapter-react-16';

Enzyme.configure({adapter: new Adapter()});

describe('Button', () => {
 describe('Rendering', () => {
   it('should match to snapshot', () => {
     const component = shallow(<Button label="test label" />);
     expect(component).toMatchSnapshot();
   });
 });
});
```

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Creating Snapshot

With Jest we have a very easy way to test if a component is rendered correctly given certain props and state. It's called snapshot testing.

Snapshot tests are a very useful tool whenever you want to make sure your UI does not change unexpectedly.

In this case we have used Enzyme's shallow rendering to help us create a snapshot. And then ...

```
npm run test
```

Jest will create a snapshot file for us inside the folder ***__snapshots__***

Notes

- **Kalau terjadi perubahan component..?**
  Update saja snapshot-nya:
  ```
  npm run test -- -u
  ```
- **Coba ganti ukuran font, lalu...?**
  ```
  npm run test
  ```

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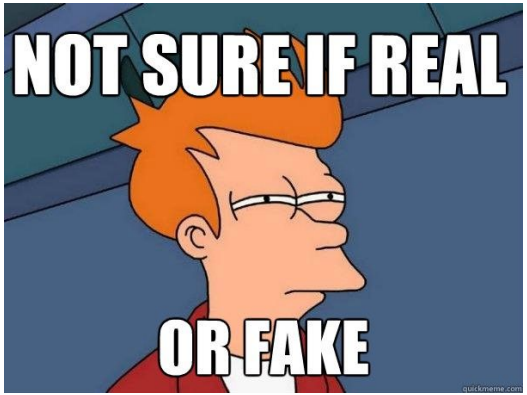
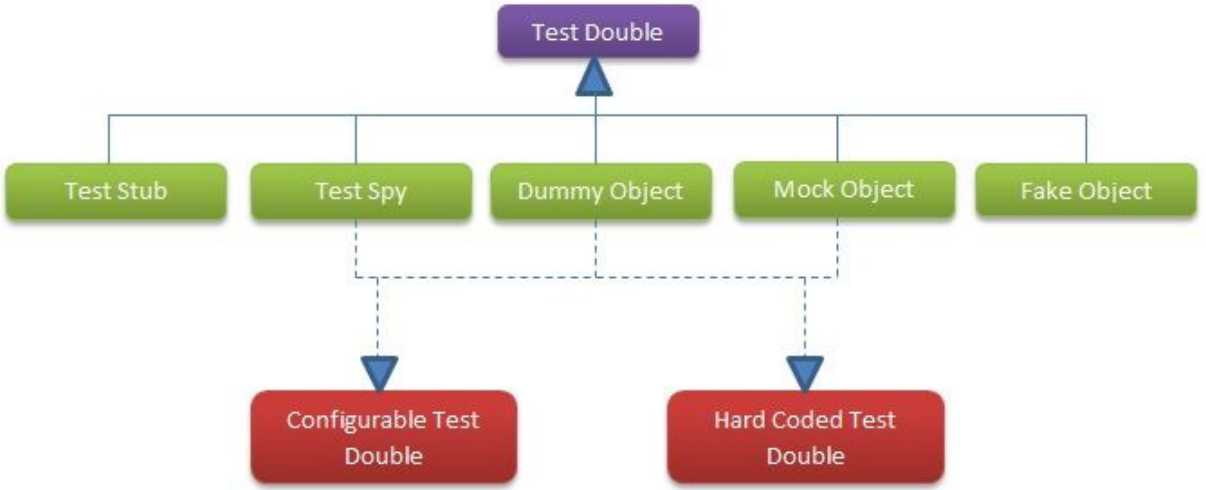
Stubs & Mocks





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Implementation Stubs & Mocks

```
describe('Interaction', () => {

        describe('onPressHandler', () => {
            it('should call onPress', () => {
                // Arrange
                const mockOnPress = jest.fn();      // 1. mock function
                const component = shallow(<Button
                    label= "test label"
                    onPress={mockOnPress}           // 2. passing in mock function as props
                />);
                const instance = component.instance();  // 3. getting an instance of component
                // Act
                instance.onPressHandler();          // 4. manually triggering onPressHandler()
                // Assert
                expect(mockOnPress).toHaveBeenCalled();
                expect(mockOnPress).toHaveBeenCalledTimes(1);   // 5. checking return values
        });
});
```

References

- Unit Testing in React Native with Jest
- TDD vs BDD vs DDD
- Unit Testing (Programming with mosh)