## Frontend Testing

General Tests Infrastructure: The [Jasmine test framework](http://jasmine.github.io/2.4/introduction.html). provides everything needed to write basic tests. It ships with an HTML test runner that executes tests in the browser.

Unit tests: Karma – The [karma test runner](https://karma-runner.github.io/1.0/index.html) is ideal for writing and running unit tests while developing the application. It can be an integral part of the project's development and continuous integration processes. This guide describes how to setup and run tests with karma.

Karma has a simple api that defines javascript testing infrastructure. The most basic functions are: it() expect() and describe(). Karma was built by the angular team to be able to tes angularjs.

End-to-end tests : Protractor – End-to-end tests explore the application *as users experience it*. In e2e testing, one process runs the real application and a second process runs protractor tests that simulate user behavior and assert that the application responds in the browser as expected.

## Testing Examples

### Protractor:

import { browser, by, element } from 'protractor';

describe('App', () => {

beforeEach(() => {

browser.get('/');

});

it('should have header', () => {

let subject = element(by.css('h1')).isPresent();

let result = true;

expect(subject).toEqual(result);

});

});

### Karma

import {

inject,

TestBed

} from '@angular/core/testing';

// Load the implementations that should be tested

import { AppComponent } from './app.component';

import { AppState } from './app.service';

describe('App', () => {

// provide our implementations or mocks to the dependency injector

beforeEach(() => TestBed.configureTestingModule({

providers: [

AppState,

AppComponent

]}));

it('should have a url', inject([ AppComponent ], (app: AppComponent) => {

expect(app.url).toEqual('https://twitter.com/AngularClass');

}));

});