

Web Application Development Assignment

Department of Information Technology

Subject: Web Application Development (2024–25)

Topic: Karma

Student Name: Durvesh Patil

Roll Number: 18

Q.1) Illustrate the need for Karma package

Karma is a powerful test runner for JavaScript that allows developers to execute tests in real browsers. It is developed by the AngularJS team and is widely used for testing front-end applications. Karma makes it easy to automate the testing process during development and continuous integration.

The need for Karma arises due to:

- **Cross-Browser Testing:** Karma allows you to run tests in multiple browsers to ensure consistent behavior.
- **Test Automation:** Easily integrates with CI tools like Jenkins, Travis CI, and GitHub Actions.
- **Real Environment Execution:** Runs tests in actual browsers rather than simulated environments, improving test reliability.
- **Support for Multiple Frameworks:** Works with testing libraries like Jasmine, Mocha, and QUnit.
- **Live Watch Mode:** Automatically reruns tests when files change, speeding up development feedback.

Karma helps maintain high-quality JavaScript applications by making it easier to write and run tests continuously.

Q.2) Implement a small application which will make use of the mentioned package (I/p, O/p)

Below is a basic example of setting up Karma with Jasmine to test a simple JavaScript function.

Step 1: Initialize Project and Install Dependencies

```
npm init -y
npm install karma karma-cli karma-jasmine karma-chrome-launcher jasmine-core --save-dev
```

Step 2: Create Source File (math.js)

```
function multiply(a, b) {
    return a * b;
}
```

Step 3: Create Spec File (math.spec.js)

```
describe("Multiply Function", function() {
    it("should return 15 when multiplying 3 and 5",
function() {
        expect(multiply(3, 5)).toBe(15);
    });
});
```

Step 4: Configure Karma (karma.conf.js)

```
module.exports = function(config) {
    config.set({
        frameworks: ["jasmine"],
        files: ["math.js", "math.spec.js"],
        browsers: ["Chrome"],
        singleRun: true
    });
};
```

Step 5: Run Karma

```
npx karma start
```

Expected Output:

```
Chrome 114.0.0 (Windows): Executed 1 of 1 SUCCESS
```

Q.3) Illustrate the need for code of ethics

A code of ethics ensures that software professionals act with honesty, responsibility, and integrity in all aspects of their work. It guides them to prioritize user safety, fair treatment, and professional behavior.

The need for a Code of Ethics:

- **Protect User Interests:** Developers must prioritize the rights, privacy, and safety of users.
- **Avoiding Harm:** Anticipate potential misuse and design systems that minimize harm.
- **Encourage Accountability:** Developers should take responsibility for their code and its impact.
- **Promote Trust:** Ethical behavior builds trust between developers, clients, and end-users.
- **Ensure Fairness:** Code must be inclusive and avoid discriminatory outcomes.

Following a code of ethics helps ensure that technology is used to benefit individuals and society responsibly and fairly.