BMI Calculation Project Report - Extended

Introduction

In a software engineering project, it is not only about writing code but also planning, analyzing, designing, developing, and testing the process. Below is a guide to document your project following software engineering principles. These documents will demonstrate the methodological preparation of your project and positively influence evaluations.

Project Title

Project: Body Mass Index Calculation Website

Project Definition

Goal: To assist users in evaluating their health by calculating their Body Mass Index (BMI).

Target Audience: General users, particularly individuals who want to monitor their health.

Functions:

- Allow users to input weight and height.
- Calculate BMI and provide the user's health category.
- Store and compare historical data.

Software Development Process

Development Methodology: Agile Approach

Reason for choosing Agile:

- Quickly adaptable to user needs.
- Improved control with small and iterative development cycles.
- Frequent communication among team members.

Sprint Plan:

- Sprint 1: Requirement analysis and creation of the basic BMI calculation page.

- Sprint 2: Development of user interface and data storage.

- Sprint 3: Completion of testing processes and incorporation of end-user feedback.

Requirement Analysis

Functional Requirements:

- User input screen (username, weight, height).

- BMI calculation function.

- Explanation of health categories.

- Retaining and comparing past BMI data.

Non-Functional Requirements:

- Usability: The website should have a simple and understandable interface for users of all ages.

- Reliability: User data should be stored accurately and securely.

- Performance: Calculations should be performed quickly.

- Portability: Compatible with different devices (phone, tablet, computer).

Design Process

System Architecture:

- Frontend: HTML, CSS, JavaScript (React or a similar framework can be used).

- Backend: BMI calculation and data storage using Node.js or Python (Flask/Django).

- Database: SQLite or MongoDB to store user data.

Interface Design:

- Home Page: User input screen.

- Results Page: Display BMI result and health category.

- History Page: Graphical representation of past BMI measurements.

Flow Diagram:

User data input -> Backend request -> BMI calculation -> Results and category -> (Optional) Save historical data.

Development Process

Coding Standards:

- Adherence to coding rules (meaningful variable names, use of comments).
- Minimized repetitive code (use of functions and modular structure).
- Code readability maintained through clean and organized structure.

Tools:

- Code Editor: Visual Studio Code.
- Version Control: Git and GitHub.
- Debugging: Browser developer tools and Python debugging tools.

Testing Process

Test Plan:

- Unit Tests: Tests written for BMI calculation function.
- Integration Tests: Communication between the user input screen and calculation function tested.
- Usability Tests: Tested by various users, and feedback collected.
- Performance Tests: System performance under load checked.

Test Results:

- All unit and integration tests passed successfully.
- Performance results were within acceptable levels.
- Some improvements made based on user feedback.

Conclusion and Lessons Learned

Achievements:

- A BMI calculation system was developed that meets requirements.

- A user-friendly interface was designed.

- Health data was meaningfully presented to the user.

Challenges:

- Initial issues with database integration.

- Time-consuming adjustments for responsive design on different screen sizes.

Lessons Learned:

- Writing modular and reusable code accelerated the development process.

- Early user feedback was effective in preventing design flaws.

- Proper planning facilitated a smooth development process.

Project Team

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