Project Idea

Section A: Defining Project Idea

1. **Project Title**

Python Code Analyzer

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2. Team Information

Name	Student ID	Role in Project
Zahra Bader Hayyan	2240006156	Tester
Hadeel abduallah alqhtani	2240003327	Reports writer
Noor Almuhsen	2240003505	Frontend developer
Yomna Al moslem	2240003445	Frontend developer
Alzahraa alabbad	2240006089	Backend developer
Eman Alnajem	2240002468	Backend developer, leader
Wedad Mohammed AL-hussaini	2240002853	Backend Developer

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3. Project Overview

This project aims to develop a tool that analyzes Python source code and generates a structured report. The report begins with overview information such as total lines, number of classes, functions and imported libraries. After the general overview, the tool provides detailed information about the classes and functions. Then the report also provides notes section that highlights potential issues. Finally our tool provides simple and clear suggestions to improve the readability and overall quality of the code.

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4. Goals

1. Improve software quality by encouraging clean, organized, and maintainable code.

2. Provide educational value for students and beginner programmers through clear and supportive feedback.

3. Promote good coding practices that align with professional software development standards.

4. Deliver a simple and accessible solution that developers can easily adopt without complexity.

5. Create a foundation for future development of more advanced tools in code analysis and software engineering.

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5. Scope of the Project

What the Project Will Cover

1. Reading Python source files and detecting key components such as classes, functions, and imported modules.

2. Measuring code statistics, including total line count, number of functions, and number of classes.

3. Handling cases where the code may contain syntax errors or be incomplete, without interrupting the analysis.

4. Examining nested structures like loops, conditionals,

functions, and classes to understand the code's organization.

5. Producing a concise report that outlines the code content, points out potential issues, and offers improvement suggestions.

What the Project Will Not Cover

1. Executing or running the Python programs.
2. Working with programming languages other than Python.
3. Automatically modifying or rewriting the source code.

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6. Main Tasks

1. Read python source code
2. Parse python code by analysing the basic structure of the code
3. Generate general overview by calculating the total number of: classes, functions, and lines.
4. Identify the imported libraries and Provide details about each function: name, parameters, and size.
5. Produce detailed structural reports
6. Identify Potential Issues like code duplication, unused libraries or missing comments.
7. Provide Improvement Suggestions by recommend practices to enhance organization and overall code quality.
8. Support Collaboration and Reusability
9. Examine nested blocks in functions, loops, and conditional statements.
10. Count the number of nested functions and nested classes.
11. During analysis, handle syntax errors and incomplete code.
12. Generate Final Report using all information (overview, details, issues, suggestions) into a structured report.

Section B. Evaluation Rubric

To be completed by the instructor or supervisor.

1. Define Your Project (6 points / 1 mark) – Week 3

Criteria	Excellent (3)	Good (2)	Fair (1)	Poor (0)	Awarded Score
Clarity of Idea	Clear, innovative, feasible idea with strong motivation.	Clear idea, feasible but generic.	Vague or weakly justified idea.	No clear idea.	/3
Initial Planning	Goals, scope, initial tasks well-defined.	Basic goals and scope.	Minimal goals, unclear roles.	No planning evidence.	/3