**Software Project Management**



**Session: 2021**

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# Funtional Points

## Project: A tool for evaluating Java code using Junit test cases generated by fine-tunned Large Language Model (LLM)

These are the Functional Points for our Final Year Project.

1. User Interactions:

* User uploads the java code files
* User evaluate the code and see the results
* User interacts with the chatbot for assistance

1. External Inputs:

* User uploads single/multiple files.
* User initiates evaluation and requests unit test generation.
* User input prompt in chatbot for assistance

1. Internal Outputs:

* Display test case execution results, code review, and bug detection outcomes
* Save execution results
* Chatbot response for personalize assistance

# Effort Estimation

|  |  |  |  |
| --- | --- | --- | --- |
| Component Type | Complexity | Points  (Out of 10) | Hours |
| **Data Gathering** |  |  |  |
| 1. Collecting Java focal method and unit test cases dataset from open-source Java repositories. | High | 9 | 1080 |
| 1. Annotating data for test case generation | Medium | 6 | 240 |
| 1. Preprocessing dataset for LLM fine-tuning. | Low | 4 | 64 |
| **Model Fine-Tuning** |  |  |  |
| 1. Fine-tuning LLM for JUnit test generation | Medium | 5 | 1560 |
| 1. Evaluating Inference and adjusting model hyperparameters | High | 8 | 168 |
| **Model Evaluation** |  |  |  |
| 1. Creating evaluation matrix for model evaluation | High | 7 | 144 |
| 1. Testing model on test set using evaluation matrix | Low | 3 | 56 |
| **Tool Development** |  |  |  |
| 1. Developing VS Code extension for user interface | Medium | 5 | 760 |
| 1. Implementing file selection/upload features | Medium | 6 | 24 |
| 1. Enabling unit test execution and result display | High | 7 | 120 |
| 1. Integrating LLM/Chatbot API with the tool | Medium | 4 | 48 |
| 1. API testing and error handling | Low | 2 | 35 |
| **Deployment** |  |  |  |
| 1. Setting up deployment environment (cloud/local) and Inference API | Medium | 4 | 85 |
| 1. Deploying the model and testing endpoints | Low | 2 | 70 |
| **Final Testing** |  |  |  |
| 1. High level system testing and Error Handling | Low | 3 | 144 |

**Total Hours on Each Functional Points**

|  |  |
| --- | --- |
| Functional Points | Hours |
| User Interactions | **904** |
| External Inputs | **192** |
| External Outputs | **3694** |
| **Total** | **4790** |

**Total time = 4790 hours (approximate 199.6 days)**