Project Title: Git Assessor – Automated Assessment of Git Usage of Students

Project Description: Git is a popular source-code version control system that allows software developers to work simultaneously and keep track of their changes over time [1]. Using Git in an educational context helps students gain the skills they require for real-life projects [2]. Even though Git provides flexibility for different working styles [3], software developers should know how they can work with Git. Software engineering lecturers may ask students to follow a specific set of rules while working with Git, such as creating a separate line of development for feature implementation, working together on a particular development line, following specific guidelines for writing commit messages, merging a specific line of development into another one, etc. [4]. This project aims to help those lecturers to automatically assess the Git usage of their students. The objective of this project is to develop a web service, called Git Assessor, to check whether a specific set of rules is followed in a given student Git repository and compute a score for each contributor of the repository. The web service should be suitable to add additional rules in the future. As part of this project, it is also expected to develop a tool, which could be a stand-alone web application or a Moodle plug-in, to provide a user-friendly graphical user interface (GUI) for software engineering lecturers to use this web service. This tool should help the lecturers to identify their rules and view the results with appropriate visualisations. Both the web service and tool will be tested with Git repositories.

This project will be developed to analyse Git repositories on GitHub, which is a web-based Git repository manager with additional functionalities to support software engineering activities.

Milestones: The milestones of this project are as follows:

- Understand how GitHub API works
- Create a set of rules to be checked
- Construct a sample Git repository to be used for the incremental development of the web service
- Develop a web service to take a repository, check whether these rules are followed or not and compute a score for each contributor of the repository
- Develop a tool with GUI to use this web service
- Test the tool with Git repositories

Project Group: This project is designed for three/four people who are interested in software engineering, version control systems, and educational studies, and also are willing to learn new technologies, read research articles, and do research.

Technical Requirements: This project requires experience with Git, web services and web development, and strong skills in programming.

Project Supervisor: Sukru Eraslan

References:

1. Scott Chacon, and Ben Straub. 2014. Pro Git, 2nd edition, Springer Nature.
2. Sukru Eraslan, Kamilla Kopec-Harding, Caroline Jay, Suzanne M. Embury, Robert Haines, Julio Cesar Cortes Rios, Peter Crowther. 2020. Integrating GitLab Metrics into Coursework Consultation Sessions in a Software Engineering Course. Journal of Systems and Software, 167, 110613.
3. Atlassian Bitbucket. Comparing Workflows. [Accessed on 09/10/2021] Available at: https://www.atlassian.com/git/tutorials/comparing-workflows
4. Sukru Eraslan, Julio Cesar Cortes Rios, Kamilla Kopec-Harding, Suzanne M. Embury, Caroline Jay, Christopher Page, and Robert Haines. 2020. Errors and Poor Practices of Software

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