SE 3XA3: Development Plan
PyCards

Team 2

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Table 1: Revision History

Date	Developer(s)	Change
Sep 30, 2016	Aravi Premachandran, Michael Lee, Nikhil Patel	Initial Revision
Nov 26, 2016	Nikhil Patel	Added description of how labels will be used as part of Git Workflow
Nov 26, 2016	Nikhil Patel	Added to description of how to the Proof of Concept Demonstration shall be conducted Added Project Review section heading

1 Team Meeting Plan

Team meetings are an essential part of the development process. It is important that the members of this group approach this project in a structured fashion and remain organized throughout. Meetings will be held during the latter portion of the regularly scheduled lab sections (time permitting) or immediately afterwards. In addition to the above listed times (or in lieu of in the case of schedule conflicts), informal meetings shall be conducted via e-communication using either of the Facebook and Skype platforms.

Meetings will be scheduled on a weekly basis to ensure there is no backlog of issues needing resolving, to keep the project progressing on schedule, and as a general debrief on the past week and for the coming week(s). Meetings will generally start with a review of the past week(s) progress, including but not limited to deliverables completed and deadlines met. Then any issues or concerns that have arisen or are ongoing shall be raised by members of the group and addressed. Finally, meetings shall conclude with a summary of progress, a reiteration of changes made and/or issues resolved during the course of the meeting, and an overview of upcoming tasks and deliverables.

2 Team Communication Plan

The primary means of communication for the members of this team shall be through the instant messaging and conferencing services available using Facebook and Skype. These platforms are both convenient and also free to use - as such they are ideal for a project of this scale. Impersonal and routine issues, comments, and conversation shall be done using Facebook. Any personal or heavily involving issues or communications shall be done using Facebook if satisfactory to all parties or using Skype if teleconferencing is deemed necessary for efficient communication and resolution.

3 Team member roles

Leader: Nikhil Patel
Experts:

- Documentation: Aravi Premachandran
- Git: Nikhil Patel
- LaTeX: Michael Lee

4 Git workflow plan

Our team will be implementing the Feature Branch Workflow using Git. The reasoning behind using the feature branch workflow is that the master branch should always contain stable, correct code. Development or modification of a new or old feature will be done within a dedicated branch, and when completed a pull request will be filed before merging with master. Using the feature branch workflow isolates the development of features from the core codebase making it easier for multiple members to work on the same or different features simultaneously while keeping the most recent working version of the software intact.

Gitlab also has an integrated issue tracking system that we will be using throughout the course of the project. Issues are a way to manage and keep track of tasks, features, bugs and much more. The main focus of issues is on collaboration. We intend to organize the issues we create using labels and issue templates. Labels function similar to keyword tags for the issue, and can be used to identify and also filter issues for better organization. Issue templates will used to provide a general format when presenting an issue to help ensure that issues contain enough relevant information to understand and address them effectively.

5 Proof of Concept Demonstration Plan

Throughout the software development process there are risks that our team will face. Some of the risks that we may face are difficulty testing the application, the software product's dependence on the user having Python installed on the host system, and also adapting the product to use automated build and testing tools.

The software product implements a graphical user interface which makes it difficult to test its functionality. It will not be practical or even feasible to use automated testing on the user interface. As such, we will be forced to use behavioural testing ie. running the application and validating its response to various inputs from the user.

Another risk we may encounter is difficulty in packaging the product as a portable and standalone application. The existing implementation relies on the user having Python installed on the host system - to overcome this we will need to perform research as to if and how the Python environment can be bundled with the application, and if it is legal to do so.

The next risk that we have to address is the desire for an automated building and testing environment. If different users or developers attempt to build and deploy the source in an unintended manner it may lead to unexpected behaviour or errors. To address this need we will look into using a build tool or writing a custom build script (ie. makefile). Having a defined build script and/or using a build tool makes the build and also deployment process consistent and also convenient for both users and developers.

The proof of concept demonstration will be a demonstration of a minimal user interface implemented in Python and using the Tkinter and ttk packages, as the design and implementation of the graphical portion of the system is anticipated to be one of the primary challenges. In addition to the implementation described above, the team will demonstrate their ability to compile, package and launch the program as a single executable file. Finally, the team shall create and show the successful execution of a subset of automated tests (to demonstrate domain knowledge, competence and feasibility) of conducting automated testing using the unittest.py module that comes with a default Python installation.

6 Technology

The software product shall be redeveloped in the same programming language as the existing implementation, Python 2.7.x . The IDE of choice will be the simplistic IDLE editor though any execution of the implementation shall be done using the command-line (shell). The pydoc documentation tool will tentatively be used for document generation, and pybuilder will tentatively be used both as a build tool and for testing.

7 Coding Style

Python is a dynamic language in that variables are not bound to a type, only the value(s) stored in it is. Python also poorly implements the principle of least privilege. As such, it is especially important to follow a consistent coding style in order to reduce the likelihood of making simple but easy-to-miss errors such as type errors. We plan on adhering to a combination of theGoogle Python Style Guide and the Python style guide defined in the Python Developer's Guide. When reviewing our code, we will run the tool pylint over our code to help enforce it. Pylint is a tool that finds bugs and style issues in Python source.

8 Project Schedule

The Gantt Project schedule for this project can be found in the Project Schedule folder.

9 Project Review