SE 3XA3: Development Plan

February 4, 2022

Team Information:

Team Number	Name	MACID
L03 G07	Qianlin Chen	chenq84
	Jiacheng Wu	wuj187
	Tingyu Shi	shit19

Table 1: Revision History

Date	**Developer(s)**	**Change**
January 31, 2022	All team members	Create Outline
February 3, 2022	All team members	Write contents

1 Introduction

This document is about the development plan of space invaders project based at the original project at the following link:
`https://github.com/leerob/space-invaders`

2 Team Information

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3 Team Meeting Plan

3.1 Time, Location, Frequency and Contents of Meetings

Meetings will take place every Monday and Wednesday from 9:30 am to 11:20 am. All the meetings will be on the Microsoft teams before February 7. We created the Microsoft Team channel "3XA3 Lab03" and we will work at the group 7 in this channel. After February 7, our team will hold in person meetings. If regular meetings are not enough, we will hold extra meetings according to team members' available time.
The contents of the meetings include discussion, implementation, assigning works outside the meetings and reporting the working progress. All the decisions and modifications should be recorded and updated by the end of the day of meetings.

3.2 Member Roles for Meetings

The following are member roles for meetings:

- Tingyu Shi is the chair of the meetings. He will host all the meetings and gather participants' ideas.
- Jiacheng Wu will be the recorder of the meeting. He will record all the decisions and changes to the project or documents.
- Qianlin Chen will assign all the tasks after the meetings to all the team members.

3.3 Rules for Agendas

An agenda is supposed to be made before every meeting. The following are rules for agendas of meetings:

- All team members are supposed to attend the meetings. If any member cannot attend the meeting, he/she needs to tell the other teammates at least one day before the meeting.
- Topics must be determined before every meeting.
- The length of meeting time shall be determined before the meeting.
- There is only one chair/leader in the meeting.
- Conflicts in the meeting shall be recorded and solved before the next meeting.
- All members should communicate respectfully during the meeting.
- All members shall be assigned a "take home" work after the meeting. The estimated time of the work of each member shall be close.
- First topic will be reviewing the agenda.
- Assess all team members' contributions in every meetings.

4 Team Communication Plan

Our team will use Microsoft Team and Facebook for communication. Microsoft Team will be used for big tasks like meetings, implementation and distributing tasks. Facebook will be used for small problems like debugging, advising and small modifications. Also, the team will contact with TAs and professor via Microsoft Team or Email. GitLab is also used to do the project. All members should write detailed commit messages so that others can understand the modifications.

5 Team Member Roles

Each member in the team will have multiple roles since the team is small. Tingyu Shi will be the leader of our team. Tingyu Shi will decide all the decisions and modifications for this project. Also, he will gather all the modifications using git. Qianlin Chen will be the lead designer of the project. Jiacheng Wu is in charge of UI of the game. All of the member will be involved in Development, testing, Documentation.

Member Names	Roles/Expert
Tingyu Shi	Team Leader, Project Manager, Meeting host Developer, Documentation
Qianlin Chen	Lead designer, Tester, Developer, Documentation
Jiacheng Wu	UI designer, Tester, Developer, Documentation

6 Git Workflow Plan

The git workflow we decided to use is Feature-Branch Workflow. The following are some details of how it will work:

- The whole project has a mean branch. You can view this branch as the official branch for this project. Main branch should not contain broken code. The code can only be merged to main branch after testing.
- For each new feature, a new branch should be created. For example, for our space invaders project, we can have one branch for space ship to move and one branch for space ship to catch additional game items.
- After each feature is tested, team members can merge them to the main branch.

The main advantage for this workflow is that main branch will not contain any broken code.
Labels will be used to indicate issues.
Milestones will be used to track progress, for example, team members can track if indicated issues are resolved.

7 Proof of Concept Demonstration Plan

7.1 Some Significant Risks

7.1.1 Implementation Difficulties

This game will be implemented with python. The good news is that every team member has experience with this language. However, we need to use pygame module for implementation and only one team member has experience with this module. Therefore, other two team members should spend time to learn this module and familiarize with the API.

7.1.2 Testing

Game testing is usually harder compared with testing of other projects. The main difficulty here is to choose an appropriate testing method so that it can cover all the scenarios.

7.1.3 Library Installation

Library installation is not a problem in this project. All users can use pip to install pygame library easily.

7.1.4 Portability

We believe that source code can be executed in different operating systems. However, the problem is to make sure that executable files can be executed in different operating systems.

7.1.5 Design and Requirements Difficulties

- Design Difficulty: The main difficulty in design process is designing appropriate modules. We need to make sure that each module is low coupling and high cohesion.
- Requirements Difficulty: The main difficulty for requirements engineering is to solve conflicts and make sure the final requirements document does not have any conflicts.

7.2 Plans to Overcome Risks

7.2.1 Implementation

Make sure team members who are not familiar with pygame go through YouTube tutorials before implementation process.

7.2.2 Testing

Unit testing will be critical for this project, before merging new features to the main branch, make sure they are well tested.
Before doing the final test for the whole project, team members should first document possible scenarios and make sure all the scenarios can be tested.
We can also invite some friends to play this game without showing them source code. This is the same as black-box testing.

7.2.3 Portability

Team members will generate different executable files for different operating systems and run these files in different operating systems.

7.2.4 Design and Requirements

- Some of the design problems can only be found when we are coding. Therefore, we need to review and revise design document regularly while implementing.
- After finishing the requirement documents, we will hold a meeting to do inspection to review them.

8 Technology

The following are some technology details for this project:

- Programming language: Python
- IDE: Each team member can use different IDEs according to their preferences. VSCode is recommended.
- Testing Framework: Pytest will be used for testing.
- Documentation: All documents should be written using LaTeX. Doxygen will be used to document code.

9 Coding style

The project's coding structure follows Python3, so we decide to use the linting standards set by VSCode in order to detect bugs and style problems in Python source code. Because of the dynamic nature of Python, some warnings may be incorrect. However, spurious warnings should be fairly infrequent.
Moreover, we will obey the all Python Style Rules listed in the `https://google.github.io/styleguide/pyguide.html` (simply like the limitation of line length and comments' rules).

10 Project schedule

Gantt_Chart_L03_G07.gan file can be found at the following:
.gan file Link

Gantt_Chart_L03_G07.pdf file can be found at the following:
.pdf file Link

The above two files can be found at the folder called "Gantt_Chart_Files", which is located at the DevelopmentPlan folder.
For some future documents, subtasks are not specified since we do not know the template right now. Gantt Chart will be updated in the future.

11 Project review

This part will be available after revision 1.