

Assignment Part 1

COSC2625 Building IT Systems

[TR Angry Panda]

[Space Shooter]

Content

A) GROUP MEMBERS	2
[ZHAOXU NIE] [s3702629]	2
[XIAOCHEN XI] [s3561226]	2
[RICARDO XIAO] [s3737289]	3
B) DESCRIPTION	3
C) DEMONSTRABLE OUTCOMES	3
PROJECT MOTIVATION	4
MINIMUM VIABLE FEATURES (MVF)	4
<i>Feature1 : Effects</i>	4
<i>Feature 2: Customize</i>	4
<i>Feature 3: Interaction (Control)</i>	5
<i>Feature 4: Tools</i>	5
<i>Feature 5: Game Functions</i>	6
EXTENDED VIABLE FEATURES (EVF)	6
1. <i>Key setting</i>	6
2. <i>Damage calculator</i>	7
3. <i>Treasure</i>	7
D) PROJECT JUSTIFICATION	8
1. WORKLOAD	8
2. BEYOND CURRENT CAPABILITIES	8
3. RISKS	9
E) HOW	9
1. RESOURCES & TOOLS	9
2. COLLABORATIVE WORKSPACES	9
3. COMMUNICATION EXPECTATIONS	10
4. DECISION-MAKING PROCESSES	10
F) PROJECT TIMETABLE	10

<https://github.com/rmit-s3702629-Zhaoxu-Nie/BITS.git>

A) Group Members

[Zhaoxu Nie] [s3702629]

Background and Passion in IT

I have been studied some IT fundamentals in China, and this is my first semester in RMIT. To be honest, I don't think I am good at IT or programming, but I really love them. I think programming and codes can make me exciting, especially when my project can be running. In addition, I really love playing computer games, so I really want to learn how to build games.

What are you good at/interested in?

I am good at designing the roles/functions of the project. I also can use Unity, that means I can link the codes to our game. I'm interested in making our project more attractive to players through beautiful visual effects.

What are your weaker points in the context of the project needs

My weaker point in the context of the projects is programming. I'm not good at coding, but I can find some help from my team members. The major job of me is to help my team linking the code to the game in Unity and build the background/objects of the game.

What role do you expect to be performing in the project

I will be valuable and active in our group. I'm the only member in our group who have experience in using Unity, so I will give others some support. Due to we don't have a team leader, I also should offer some ideas and making decisions with other team members together.

[Xiaochen Xi] [s3561226]

Background and Passion in IT

I have completed several programming courses so I have some initial programming and design skills. When I was in high school, I often browsed some IT forums and related articles. Although I did not understand a lot of professional knowledge.

[What are you good at/interested in?]

One of the courses I was most interested in was user-centered design, so I like to design some interfaces based on relevant theories. I also have studied some related programming courses so if there is a new language to learn, I can also get started quickly.

[What are your weaker points in the context of the project needs]

I have never used Unity and I need to learn about this application, so this will waste some time. I am not very good at programming.

[What role do you expect to be performing in the project]

I will be active and keep good communication with all the group members and do some work that the group needs me to do. Maybe trying to do some code and interface design.

[Ricardo Xiao] [s3737289]**Background and Passion in IT**

This is my first year in Bachelor of IT, so generally, I'm a novice in doing IT works. However, I'm pretty interested in IT and computer science, because I think it's very cool and it gives me a lot of fun, especially when I finish my project. I began to feel interesting in IT at 12, I watched resident evil on my summer holiday. The red queen was awesome, it was so clever and powerful, and it made me start to think about how to build a stuff like that. So I asked my dad to register a computer school with me when I was 14. However, the school manager told I can get access to this school unless I finish high school. So I had to give it up for several years until I came to RMIT in 2018.

What are you good at/interested in?

I'm good at thinking in different aspects and come up with a different idea. And I'm interested in making our project look special and pretty.

What are your weaker points in the context of the project needs

I'm not good at coding, especially code in a language which is brand new for me. Fortunately, my group members can provide some assistance, so I think I'm able to conquer this challenge.

What role do you expect to be performing in the project

I wanna be a valuable participant in this project, I want to put some of my ideas in our project and make sure my works can go well.

B) Description

Our team plans to use unity to create a space-based shooting game. This is a 2D game. The entire game is played in a 2D environment. Players can control a mini fighter and use predictive movement to avoid or shoot against enemy fighters. When the player-controlled fighter is destroyed, the game fails, and when all the enemies are destroyed, the game wins.

C) Demonstrable Outcomes

Project Motivation

1. Unity is a very popular application so the difficulties we face in the future can be easily answered in Google or other people with relevant experience. Unity's interface is simple and friendly to people who are new to unity.
2. Everyone in our group has a strong interest in making a game. One of the team members has used this application, although he is not an expert, it will be of great help to our study.

Minimum Viable Features (MVF)

Feature1 : Effects

1. The entire game runs in a 3D environment, the player-controlled fighters, obstacles and enemy fighters are all 3D and the background is a scrolling 2D image.
2. Each unit in the game is set up with a collider. When they collide, a 3D collision effect will occur. For example, when our fighter collides with an obstacle, it will produce a 3D explosion effect.
3. The obstacles in the game are mostly meteorites, we set a special effect for it, so that it is always rotating, which makes the effect look better.
4. The enemy fighter will move irregularly on the horizontal line while colliding vertically in the direction of the player-controlled fighter.
5. The game has its own background music. And when the fighter fires a bullet or is destroyed, there are different sound effects.
6. An explosion effects animation will appear when our fighter is destroyed.

<https://trello.com/c/ecZxEaYe>

<https://trello.com/c/pvaBTKey>

<https://trello.com/c/LAJQTAY7>

Feature 2: Customize

Players are able to personalize the moving speed of the user's ship/enemy's to make the game easier/harder. For example, we can let the enemy's ship moving faster to make player are hard to

escape. We also can slow down the moving speed of meteorites to make the game more acceptable for beginners.

<https://trello.com/c/o2LDqORz>

<https://trello.com/c/rKEAWwgu>

Feature 3: Interaction (Control)

Users are able to control the movement of characters in the game by using the arrow keys or 'W' 'A' 'S' 'D'. Users also can press a specific button to control the user's ship shooting to destroy obstacles. When the game over (user's ship are destroyed), they can press 'R' to start a new game.

<https://trello.com/c/OvypM96h>

<https://trello.com/c/95o2ZhX8>

<https://trello.com/c/wfRENhCY>

Feature 4: Tools

We use Unity as the platform to do our project because it's pretty advanced and user-friendly. The most important reason is our project is an open source of Unity. In this project, we chose JavaScript as our code language. The first reason is JavaScript is supported by Unity. Secondly, all of our group members have Java experience, so we believe we can get started quickly even we did not use it before.

<https://trello.com/c/aeKAOC0Y>

<https://trello.com/c/aeKAOC0Y>

Feature 5: Game Functions

1. In this project, enemies and meteorites will appear randomly at top of the screen and move to the bottom, meteorites only move vertically but enemies will also have parallel movement. This is due to in real life, meteorites usually move on a stable orbit but enemies won't.
2. For every object, we create a mesh collider for it, which is like a shield covers the object. We use it to determine attack and crash, if spaceship's collider is touched by other things besides the boundary, it will crash and then the game over. If meteorites and enemies' colliders are touched by bullets' colliders or spaceship's collider, they will boom as well.
3. We create a scoreboard for counting marks made by players and it will be shown at the upper left corner of the screen and refresh on time. Player will get 10 marks for every aerolite destroy and 20 marks for every enemy destroy.
4. We are going to write a method to delete bullet in a short time after it is created. This is for saving memory space and improving game performance. Because if we don't do that, every single bullet will be saved in the system. They will keep going in the system but not on screen. When there are more and more bullets are created, it will take the computer a lot of sources to process it.

<https://trello.com/c/lkgN6YI3>

<https://trello.com/c/7OOUeEn6>

<https://trello.com/c/ftzKmBbf>

Extended Viable Features (EVF)

1.Key setting

Users can set buttons according to their own habits (which may come from the operating habits of other RPG games). For example, you can change the shooting key from [space] to [shift].

<https://trello.com/c/XsBZpNBR>

<https://trello.com/c/C5SPGbjX>

<https://trello.com/c/h1LjJ1fB>

2. Damage calculator

We are trying to let the user's ship can afford more than 1 times attacks. That means we will add a damage calculator into the game, like we give user's ship 100 HP, if user's ship crash by stones, HP -20, if attacked by enemy's bullet, HP -10. When HP become 0, game over.

3. Treasure

We are planning to add some treasures when user destroy the enemy's ship. They can get some objects like HP recover from treasures.

D) Project Justification

1. Workload

Task	Xi	Nie	Xiao
Recognize Unity and Learn the basic skills needed to make a game	4 hours	4 hours	4 hours
Set up collider	2 hours	3 hours	2 hours
Obstacle effect	4 hours	5 hours	4 hours
Make the background scrollable	1 hours	1 hours	1 hours
Movement of enemy fighter	5 hours	5 hours	5 hours
Background music	/	1 hours	/
Scoreboard	2 hours	2 hours	2 hours
Delete excess bullet	1 hours	/	1 hours
Explosion effect	1 hours	2 hours	2 hours
Restart the game	4 hours	3 hours	4 hours
Enemies and meteorites appear randomly	3 hours	2 hours	3 hours
Key setting	2 hours	2 hours	2 hours
Damage calculator	5 hours	6 hours	6 hours
Enemy's ship can tracking user's ship	3 hours	3 hours	3 hours
Treasure	6 hours	5 hours	6 hours
Store grades	4 hours	4 hours	4 hours
Total	47	48	49

2. Beyond Current Capabilities

After our research, some scripts may need to be compiled during the process of making this game. At present, all members of our group have studied java, we have the basic entry-level learning code. After our preliminary research related tutorial, we can choose a variety of languages such as c#, JS or BOO. Based on our background, we all agree that it is more appropriate to try to learn JS. So when we complete this project, we will have the ability to compile the primary JS.

3.Risks

1. We might be unable to do the project well, because it the first time to use Unity for Xiaochen and Ricardo. So we Zhaoxu will teach other two people to use it and we will find some tutorial on the internet.
2. We may be not able to finish our work on time at the next assignments, because build a system and write a report will take a lot of time but we only have three people in group. So we decide to spend more time on the project to finish it on time.
3. The game may have some bugs because we are new to JS, and we may hard to debug. But we will trying to make the game perfect.

E) How

1.Resources & Tools

Tools: Unity from <https://unity.com/>

Unity is the most widely-used cross-platform real-time game engine, which developed by Unity Technologies. It could help us build a game which could have excellent visual effects. This is hard to achieve if we just use programming software such as Eclipse.

It's free for personal users and students.

This platform is easy to learn, and we can find a lot of learning resource/tutorials from the internet. So we decide to use Unity.

2.Collaborative Workspaces

Google Drive

<https://drive.google.com/drive/folders/1X5lgF2j06t7Km82WSd4rQbjroCXxlCus?usp=sharing>

Trello

<https://trello.com/b/SXpXVMo9>

Office 365 OneDrive

<https://rmit.edu.au->

my.sharepoint.com/:f:/r/personal/trevor_reynolds_rmit_edu_au/Documents/BITS1910/Trevor%20Groups/TR-Angry-Pandas?csf=1&e=xlyMs7

3. Communication Expectations

WeChat group

Each of our group members should turn on the notification of our group, to ensure we can respond as soon as possible (no more than 1 hours). We will share our work progress, discuss, ask questions for help and arrange meetings in that WeChat group.

4. Decision-making Processes

Due to our group at a very small scale (only 3 person), we think it's not necessary for us to have a team leader. When we want to make some decisions, we can share our own ideas of the project and discuss to choose the best idea to do. If we have disputes in the decision-making process, we could vote to deal with problems.

F) Project Timetable

Title	Planned Start	Planned Due	Lead by
Week 3			
https://trello.com/c/aeKAOC0Y	3.18	3.22	All group members
https://trello.com/c/XbsMqPyn	3.23	3.24	All group members

Title	Planned Start	Planned Due	Lead by
Week 4			
https://trello.com/c/ecZxEaYe	3.25	3.28	All group members

https://trello.com/c/pvaBTKey	3.29	3.30	All group members
https://trello.com/c/LAJQTAY7	3.30	3.30	All group members

Title	Planned Start	Planned Due	Lead by
Week 5			
https://trello.com/c/OvypM96h	4.1	4.5	All group members
https://trello.com/c/95o2ZhX8	4.5	4.13	All group members

Title	Planned Start	Planned Due	Lead by
Week 6			
https://trello.com/c/95o2ZhX8	4.5	4.13	All group members
https://trello.com/c/wfRENhCY	4.13	4.14	All group members

Title	Planned Start	Planned Due	Lead by
Week 7			
https://trello.com/c/lkgN6YI3	4.15	4.20	All group members
https://trello.com/c/7OOUeEn6	4.20	4.26	All group members

Title	Planned Start	Planned Due	Lead by
Week 8			
https://trello.com/c/7OOUeEn6	4.20	4.26	All group members
https://trello.com/c/ftzKmBbf	4.27	4.26	All group members

Title	Planned Start	Planned Due	Lead by
Week 9			
https://trello.com/c/o2LDqQRz	4.29	5.3	All group members

https://trello.com/c/rKEAWwgu	5.4	5.5	All group members
---	-----	-----	-------------------

Title	Planned Start	Planned Due	Lead by
Week 10			
https://trello.com/c/XsBZpNBR	5.6	5.10	All group members
https://trello.com/c/C5SPGbjX	5.11	5.11	All group members
https://trello.com/c/h1LjJ1fB	5.12	5.12	All group members

Title	Planned Start	Planned Due	Lead by
Week 11			
https://trello.com/c/pbQCbJq3	5.13	5.19	All group members