COMPUTER GRAPHICS (KT34303)
SEMESTER 1, 2021/2022 SESSION
HC00

PRODUCT DEVELOPMENT 1

PROJECT TITLE:

RAPUNZEL:WHEN THE TEA SPILLS

LECTURER:

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PREPARED BY:
GROUP 13

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1.0   INTRODUCTION

The title of our movie is *RAPUNZEL: WHEN THE TEA SPILLS*. The genre we have chosen is drama. The backgrounds throughout the movie include inside the tower, outside the tower, forest, and forest view from the tower. The characters involved are Rapunzel, a prince and a witch. A brief description of the story is as follows.

The witch and Rapunzel converse in the tower, before the witch leaves to buy ingredients for her potion. Rapunzel then sits by the window and sings. The prince is attracted to Rapunzel's singing and tries to find her. The prince then climbs up the tower using Rapunzel's hair. The prince and Rapunzel then dance together. When the witch returns, she finds the prince's dead body in the tower. Rapunzel reveals that she has known the witch's secret and plan all along. The witch and Rapunzel fight and Rapunzel dies.

2.0 THE MOVIE

The key scenes, technical issues encountered during development and creative and technical decisions made at each stage is described as follows:

Scene 1
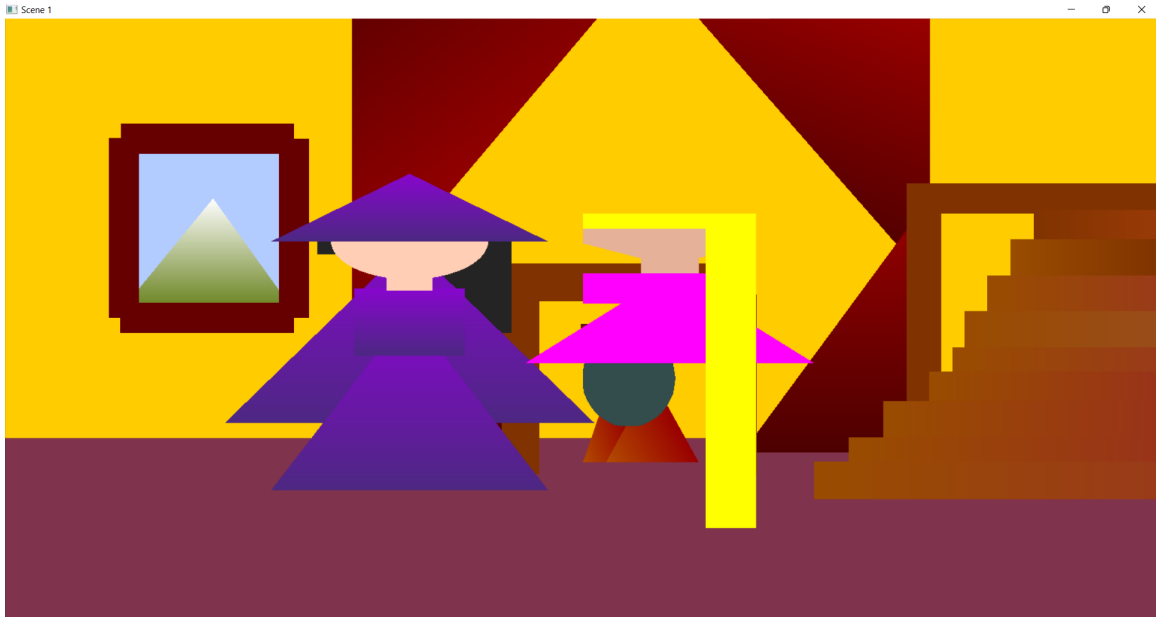
This scene shows Rapunzel's mother, The Witch, telling her daughter that she is going downtown and will be back before the sun sets. The technical issue I encountered while doing this scene was I found that it was so difficult to do the movement for the characters, especially the speed, distance and position.

This scene shows Rapunzel that is confined in the tower in the morning. She stared sadly outside the window while letting her long hair out. While building this scene, the difficulty that resurfaced are first, since it was different members that made different characters and also backgrounds, the coding style used were not all the same. We have to fix some of them accordingly so the result is achieved.

This scene shows that Rapunzel started singing because she was bored due to being confined at the tower. She sang loudly and beautifully, and it eventually can be heard in the forest close to the tower, which, coincidentally, was heard by the Prince. While building this scene, difficulties that have surfaced is how can the music notes be animated continuously even after the notes are made out of the background and in number more than one. To solve this, more references were made to learn about loops in animation.

Scene 4

In this scene the prince is walking in the forest and suddenly hears someone singing beautifully and tries to find where the singing source came from. During the development of this scene, the technical issue that I encountered is to build a perfect shape such as the mountain, trees and the prince. It was very difficult to identify which code is used to change the position and what size of the shape is suitable for the different objects. It took me a long time to understand the x, y, and z axis to make sure that the codes are correct to build the exact shape and place it according to storyboard which has been prepared and designed by our team member Fazira Modi (BI19110234).

In this scene the prince finds the source of the singing. He then approaches Rapunzel and the tower. The technical issues faced while developing this scene is to choose the right speed and distance of travel to ensure that the movement is suitable. To solve this issue, a timer callback function, glutTimerFunc() and a suitable value for increment of distance was used. Apart from that, the backgrounds, characters and objects were done by different members of the team. Therefore, it was very challenging to scale and translate the position of the object so that it is suitable with the background and other characters that are present in the scene. To solve this issue, a trial and error method was used until the suitable size and positions for the characters and objects were identified. Furthermore, another issue that I encountered was certain objects disappeared when combined with the background. Therefore, the functions in the objects have to be modified to ensure it appears together with the background and other objects.
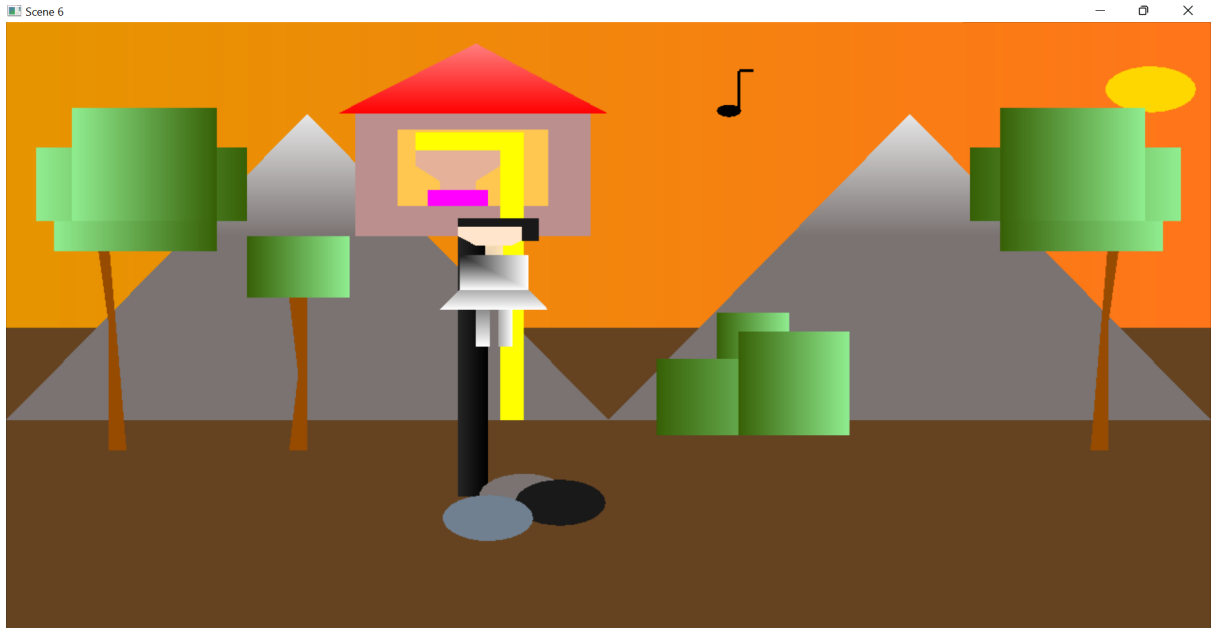
In this scene the prince climbs up the tower using Rapunzel's hair. The technical issue faced is changing the motion of the prince from right to left to bottom to top. Therefore, a trial and error method was used until the position, speed and distance of the prince was identified.
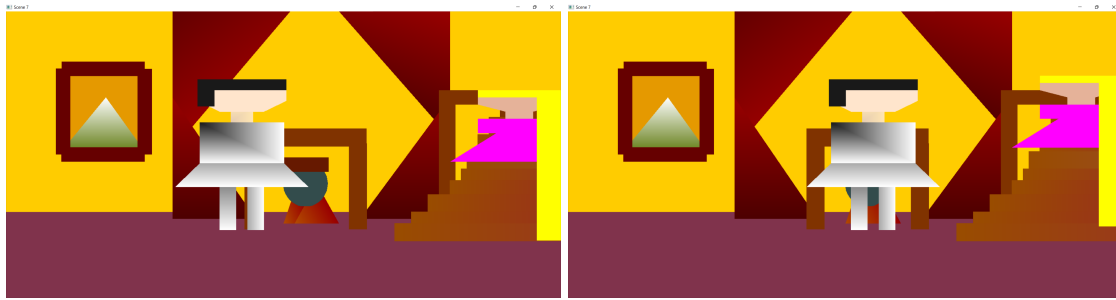
This scene shows that the prince had climbed up the tower to find the source of the beautiful voice that he heard before. Rapunzel seems rather baffled. However, she accepted the prince's request and danced with him, making the prince excited.
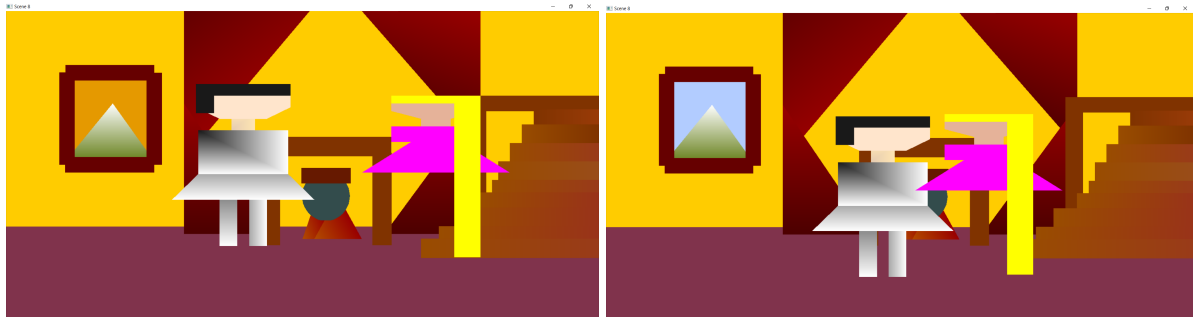
The technical issues that I encountered was that the objects and background would always disappear and the function glLoadIdentity() had always messed up these scenes whenever I did not know where to put it respectively.

Scene 9

In this scene the witch comes back to check up on Rapunzel at the tower, the witch called Rapunzel and asks her to put down her hair so that she can go up to the tower using Rapunzel's long hair as a ladder. For this scene the problem that I encountered was to find the suitable angles to make the witch go up and how to put Rapunzel's long hair down automatically. Also, when combining all the codes to produce this scene, some objects are misplaced, where the void display(); of each object needs to be arranged according to the suitable layer of the objects which should be on the top or placed in front are put last. I ask help from my team members about the problem that I encountered and they help me to spot where I made mistakes and I refer to youtube and github a lot about how to make the 2D animation.

Scene 10
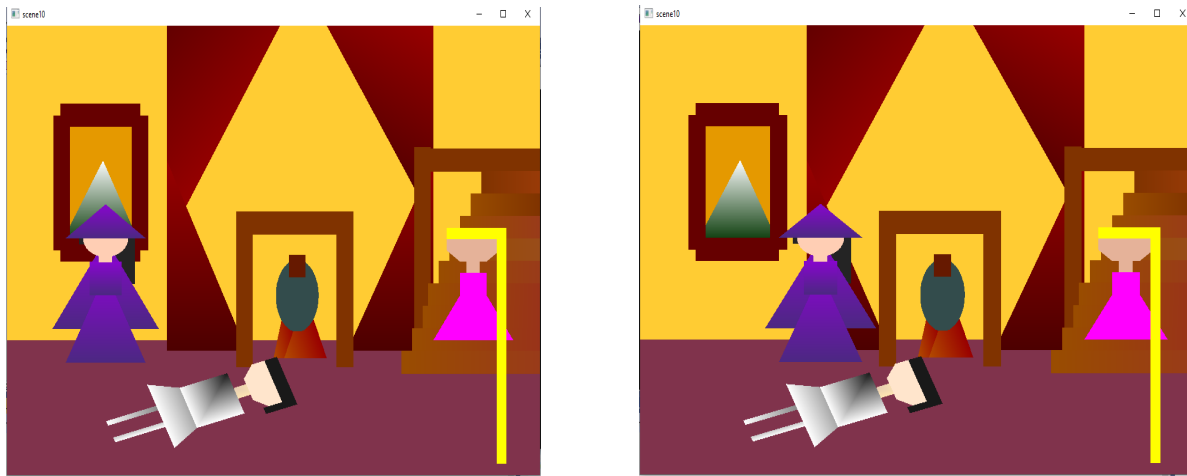
In this scene, the witch enters the tower and finds the prince's dead body laying on the floor. The witch then approaches Rapunzel and asks what she has done to the prince. While coding for the witch's movement, I encountered a technical issue where some of the objects in the scene will disappear once I run the code because of the absence of the function glLoadIdentity() in some parts of the objects' function. I managed to get the right output for the scene as I discussed the code with my team members.

Scene 11

-
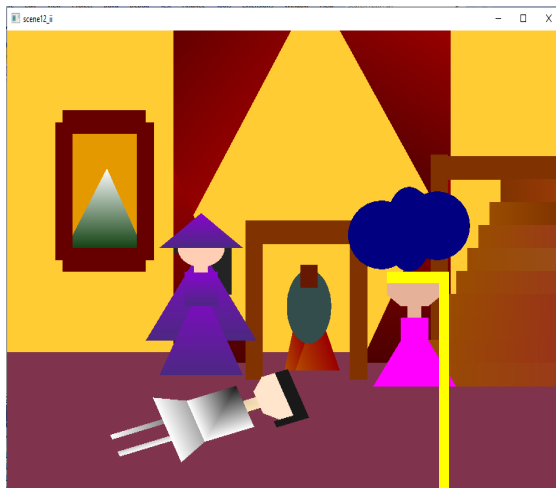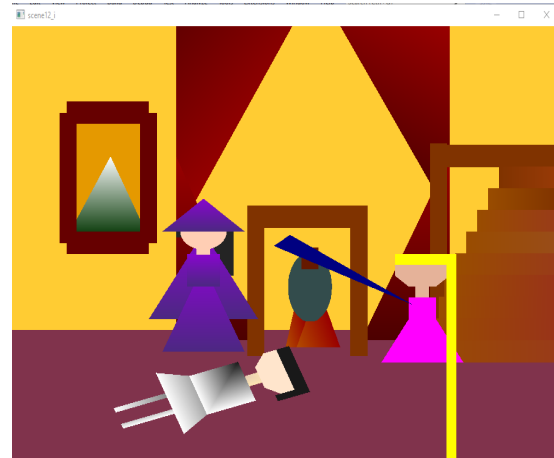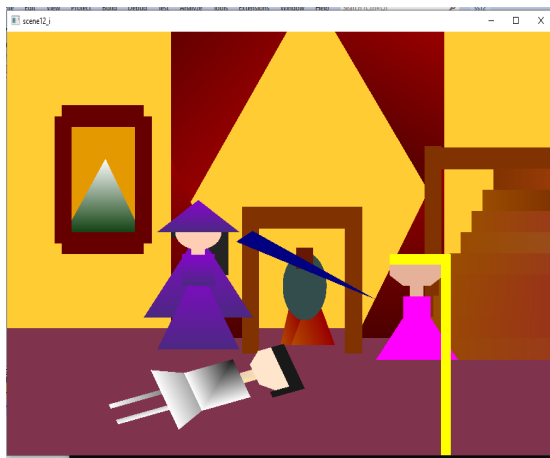
This scene shows how angry and frustrated the witch is towards Rapunzel since she has killed the prince. The witch then uses her blackmagic spell towards Rapunzel. The technical issue I encountered during developing this scene is while setting the right pace and distance travels for the objects' movement. However, I managed to set the right pace and distance traveled for the moving object as I did trial an error on the code.

3.0   REFERENCES

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   %20Epilogue%20Of%20Education/main.cpp

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   krishno0894/Dream-Village. GitHub.
   https://github.com/krishno0894/Dream-Village/blob/master/main.cpp

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   1aaf81d83c4

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   http://www.swiftless.com/opengltuts.html

4.0   APPENDIX

Scene 1	Scene 2
The witch went to the city to buy ingredients for her potion **Background** : (1) Inside tower (2) Outside tower **Characters**: Rapunzel, Witch **Motion**: (1) Rapunzel and witch talking inside tower (2) Rapunzel let her hair down, the witch climbs down the tower **Dialogue**: Witch: I'm going downtown. I'll be back before the sun sets Rapunzel: Alright mother	Rapunzel sitting near the window **Background** : (1) Outside tower **Characters**: Rapunzel **Motion**: Sun moving from left to right screen Dialogue: -
Scene 3	**Scene 4**
Rapunzel sitting near the window saw the prince from a distance then sings **Characters**: Rapunzel, Prince **Background** : (1) Outside tower (2) Forest view from tower **Motion**: Music notes flying from tower to the right of screen **Dialogue**: -	Prince find the singing source **Characters**: Prince **Background** : (1) Forest **Motion**: Prince walk fast from left to right **Dialogue**: Prince: Such a wonderful voice
Scene 5	**Scene 6**
Rapunzel sitting by the window, Prince arrived near the tower **Characters**: Rapunzel, Prince	Prince climbs up **Characters**: Prince **Background** :

Background : (1) Outside tower **Motion**: (1) Music notes flying from tower to the right of screen (2) Prince move from left/right side of the screen towards the the tower **Dialogue**: Prince: Milady x3 Rapunzel: (pretends not to hear)	Outside tower **Motion**: The prince move up the tower Dialogue: -
Scene 7 Prince enters the tower **Characters**: Rapunzel, prince **Background** : Inside the tower (shows window and the interior) **Motion**: Prince move from window to Rapunzel slowly **Dialogue**: Prince: Milady, your singing pleased my ears Rapunzel : (Starts to sing)	**Scene 8** Prince and Rapunzel dance **Characters**: Rapunzel, prince **Background** : Inside the tower **Motion**: Prince and Rapunzel dance (I'm not sure what motion to choose) — maybe the motion of prince and rapunzel moving left to right a few times. **Dialogue**: Prince: Who are you? Rapunzel : I'm Rapunzel (stabs)
Scene 9 Witch comes back **Characters**: Rapunzel, Witch **Background** : Outside tower **Motion**: (1) Witch moves from either side of screen towards the tower (2) Rapunzel's hair fall down the tower (3) Witch moves up the tower	**Scene 10** Witch enters the tower and sees the prince's dead body **Characters**: Rapunzel, Witch, Dead Prince **Background** : Inside tower **Motion**: (1) Witch moves from the window to Rapunzel **Dialogue**:

Dialogue: Witch : Rapunzel… Rapunzel… Let down your hair Rapunzel : (let her hair down)	Witch : WHAT HAVE YOU DONE?! Rapunzel : I know the truth
Scene 11 Text explaining what Rapunzel knew. [Long ago the Witch had a forbidden affair with the King. Both the queen and the witch bear the fruit of the king. The witch first gave birth to the prince and was hidden in a secret chamber outside the castle. Soon after, the queen gave birth as well. Right after the baby was born, the witch cast a spell and switched their baby, fearful of her son getting killed if she ever got caught. The spell cast a curse to the witch, a swift aging. Soon after, the queen found out about the affair and put out a bounty to kill the witch. The witch ran deep into the forest along with the princess. She raised her as her own and called her Rapunzel. She plans to kill her when she turns 20 to break the curse she's under. Rapunzel found out the truth when the witch talks in her sleep]	**Scene 12** Witch fights with Rapunzel **Characters**: Rapunzel, Witch, Dead Prince **Background** : Inside tower **Motion**: (1) Witch fight Rapunzel — can add some magic out of the witch. **Dialogue**: -

BACKGROUNDS

1. Inside tower (daytime)
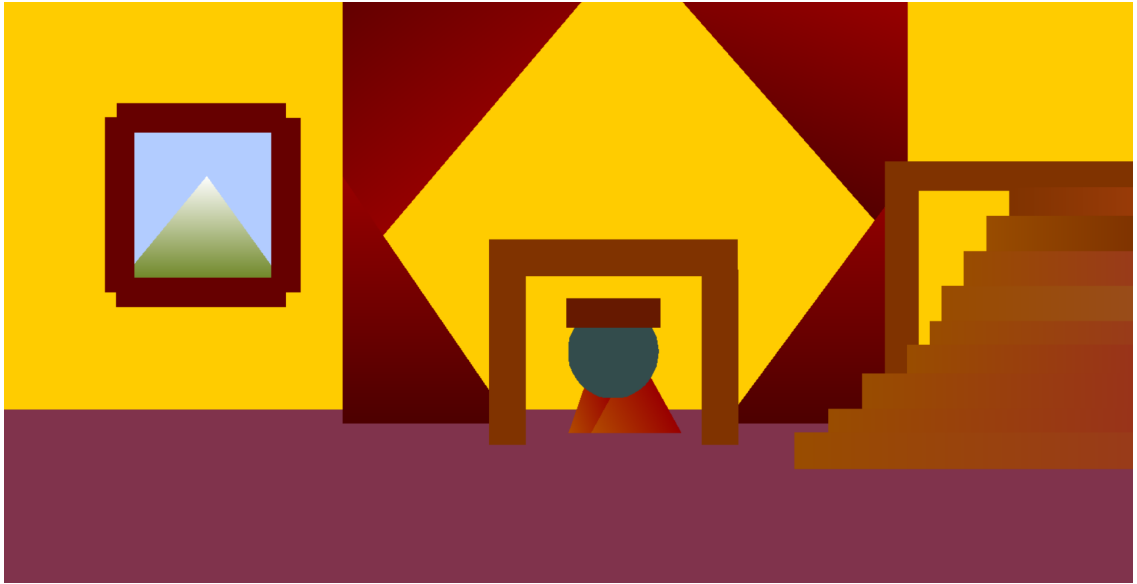
2. Outside tower (daytime)
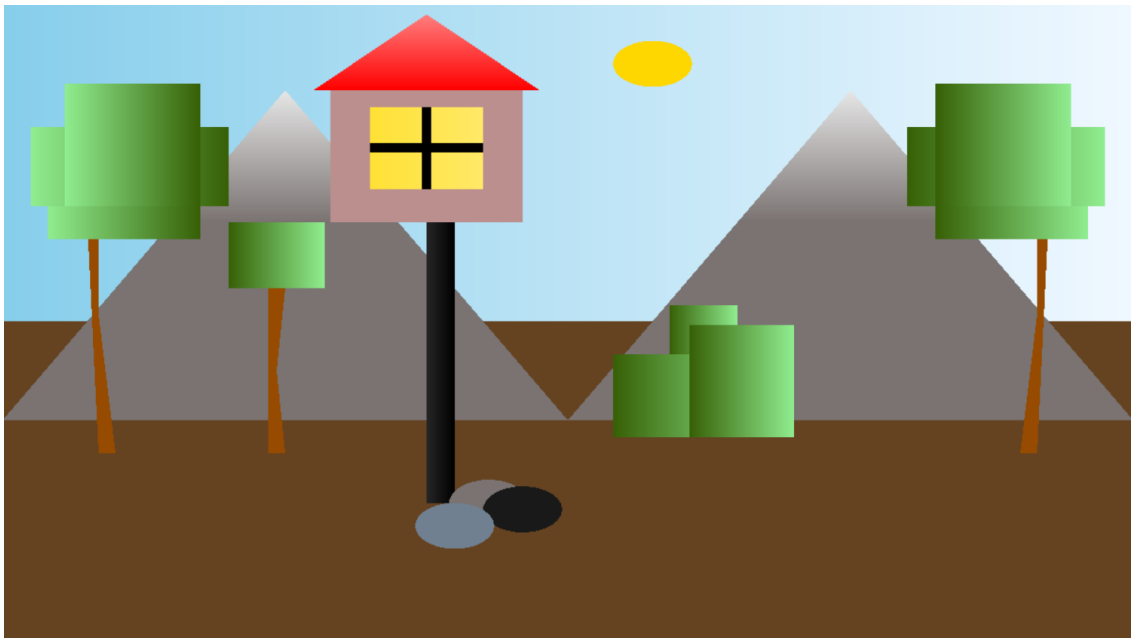
3. Inside tower (evening)

4. Outside tower (evening)

5. Forest view from tower
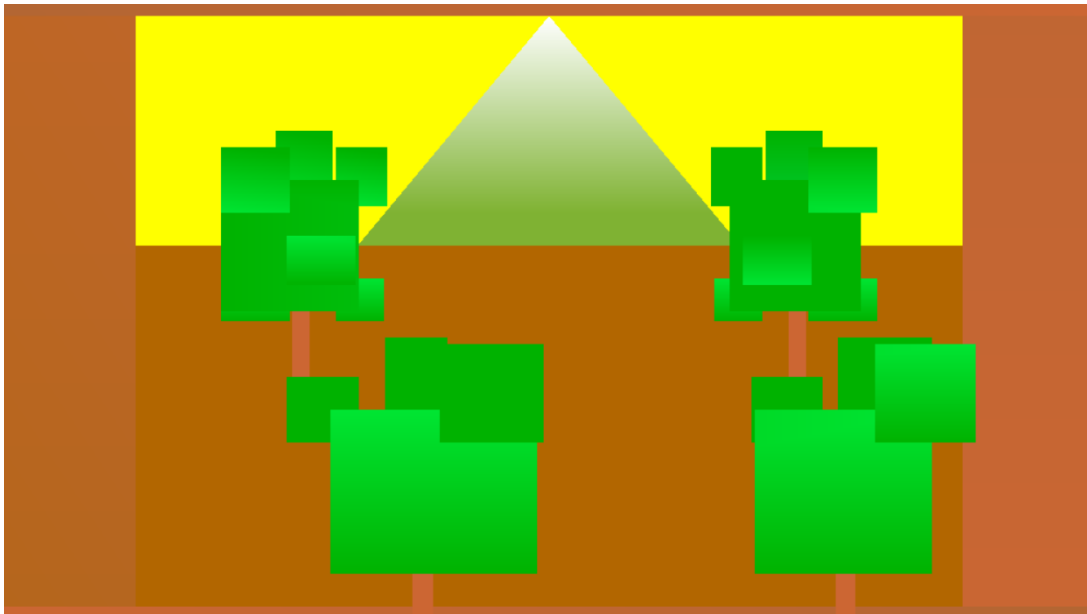
6. Forest

CHARACTERS & OBJECTS

1. Rapunzel
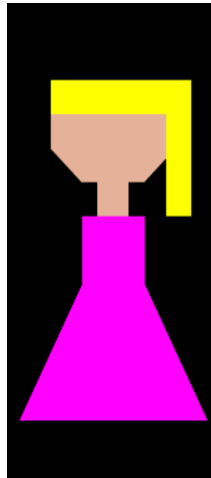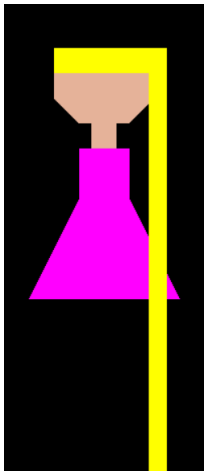
2. Prince
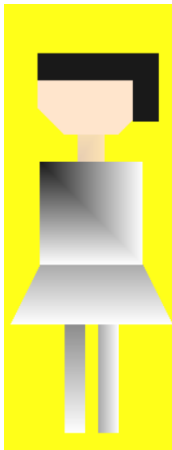
3. Witch
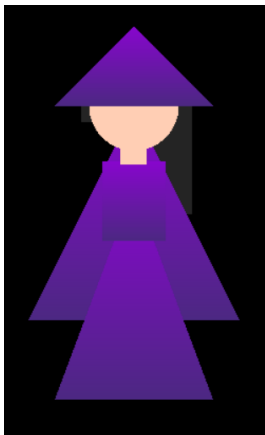
4. Clouds/Smoke
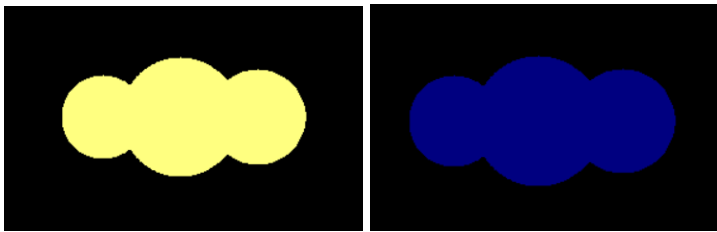
5. Sun
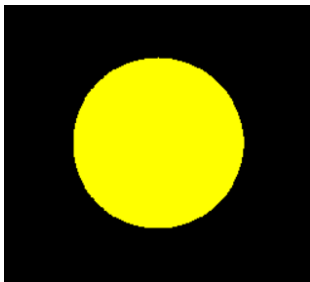
6. Magic zap
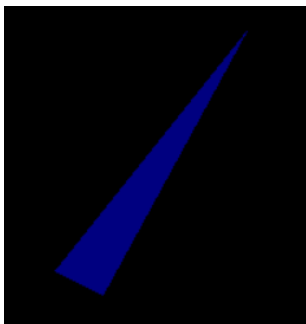
7. Music notes

STORYBOARD

SCENE 1 *The witch went to the city to buy ingredients for her potion*		
Character	Background	
Rapunzel, Witch		
Motion		
(1)Rapunzel and witch talking inside tower (2)Rapunzel let her hair down, the witch climbs down the tower		
Dialogue		
Witch : I'm going downtown. I'll be back before the sun sets Rapunzel : Alright mother		

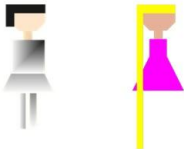| SCENE 2 *Rapunzel sitting near the window*		
Character	Background	
Rapunzel		
Motion		
Sun moving from left to right screen		
Dialogue		

SCENE 3 *Rapunzel sitting near the window saw the prince from a distance then sings*

Character	Background
Rapunzel, Prince	

Motion
Music notes flying from tower to the right of screen

Dialogue

SCENE 4 *Prince find the singing source*

Character	Background
Prince	

Motion
Prince walk fast from left to right

Dialogue

SCENE 5 *Rapunzel sitting by the window, Prince arrived near the tower*	
Character	**Background**
Rapunzel, Prince	
Motion	
(1) Music notes flying from tower to the right of screen (2) Prince move from left/right side of the screen towards the the tower	
Dialogue	
Prince: Milady x3 Rapunzel: (pretends not to hear)	

SCENE 6 *Prince climbs up*	
Character	**Background**
Rapunzel, Prince	
Motion	
The prince move up the tower	
Dialogue	
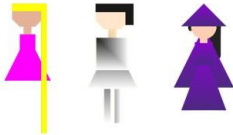
SCENE 7 *Prince enters the tower*	
Character	Background
Rapunzel, Prince	
Motion	
Prince move from window to Rapunzel slowly	
Dialogue	
Prince: Milady your singing pleased my ears Rapunzel: (Starts to sing)	

SCENE 8 *Prince and Rapunzel dance*	
Character	Background
Rapunzel, Prince	
Motion	
Prince and Rapunzel dance (I'm not sure what motion to choose) — maybe motion of prince and rapunzel move left to right few times.	
Dialogue	
Prince: Who are you? Rapunzel: I'm Rapunzel (stabs)	

SCENE 9 *Witch comes back*

Character	Background	
Rapunzel, Witch		

Motion

(1) Witch moves from either side of screen towards the tower (2) Rapunzel's hair fall down the tower (3) Witch moves up the tower.		

Dialogue

Witch : Rapunzel... Rapunzel... Let down your hair
Rapunzel : (let her hair down)

SCENE 10 *Witch enters the tower and sees the prince's dead body*

Character	Background	
Rapunzel, Dead Prince, Witch		

Motion

(1) Witch moves from the window to Rapunzel		

Dialogue

Witch : WHAT HAVE YOU DONE?!
Rapunzel : I know the truth

SCENE 11 *Text explaining what Rapunzel knew.*		
Character	**Background**	
	26	
Motion		
Dialogue		

SCENE 12 *Witch fights with Rapunzel*		
Character	**Background**	
Rapunzel, Dead Prince, Witch		
Motion		
(1) Witch fight Rapunzel (again idk what motion to use) — can add some magic out of the witch. macam some sort of vapor.		
Dialogue		