**Summary of the game (features I am going to implement):**

In this game of asteroids, I am going to make the asteroids split into smaller asteroids when they are shot by the player, implement shield pick-ups that sometimes fall when the asteroids are shot, allowing the player to survive one death without losing a life, and finally try to implement an enemy space ship that can move around by itself and shoot back at the player before the next round of asteroids appear.

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| ID | Trying to do | How I did it | Problems that occurred | Solutions | Diagrams/Screenshots |
| 1 | I am going to create a feature where the asteroid splits into 2 smaller ones once an asteroid is shot. | I used the logic for creating the normal asteroid and altered the size of them. | a) The new wave will start without all of the previous asteroids being destroyed.  b) Whenever I shot the smaller asteroids it would keep creating more small asteroids.  c) When the asteroid splits into 2, the 2 asteroids will appear randomly in the game world rather than where it was initially destroyed. | a) Had to move the implementation from the ‘Asteroid’ class to the ‘Asteroids’ class, to manage the number of asteroids still active.  b) I created an ‘IF’ statement to identify if the asteroid was a big one or a small one, so only the big asteroids can split.  c) I passed the asteroids position through the parameters so that I can set the 2 smaller asteroids at the same position. | a) Not needed.  b) See appendix 1.  c) See appendix 2. |
| 2 | I am going to implement a shield that will protect the ship from one collision (from the asteroid), resulting in a life saved. You will re-spawn without a life lost. | Created a new class and header file to create the shield and implemented its properties. I had to also allow other files to access its methods and control when the shield was active or not. | a) The image isn’t showing, instead a white square is displayed.  b) The shield would collide with asteroids, destroying them.  c) The spaceship still dies when picking up the shield.  d) No indication if the shield is active.  e) The shield spawns after every asteroid being destroyed.  f) I tried to implement a shield bubble around the player when the shield was active but I couldn’t find the way to make it appear and disappear when needed. | a) I had to make the image a sprite for it to be added properly.  b) Had to make a collision test so the shield only collides with the spaceship. I also had to alter the asteroids collision test.  c) I altered the OnCollision() method in the spaceship so it removes the shield and not itself. (The shield doesn’t remove itself).  d) I have added a GUI label saying when the shield is active. The message gets updated when the shield is active or not.  e) I have put a random number generator to make it a chance-based power up (1 in 10 chance).  f) No solution. | a) Not needed  b) See appendix 3  c) See appendix 4  d) See appendix 5  e) See appendix 6 |
| 3 | I am going to create an alien spaceship that can shoot back at the player with its own movement mechanics. | Created a header and a cpp file for the enemy ship using the same logic for the spaceship. | a) The next round starts before the enemy is killed.  b) Tried to implement auto movement for the enemy ship.  c) Tried to make the enemy ship shoot back at the player. | a) I have created a counter for the enemy so the round only start when the enemy dies.  b) No solution.  c) No solution. | a) See appendix 7 |

**What the game can do:**

The asteroids can split into smaller asteroids when shot.

Shield pick-ups drop occasionally when asteroids are destroyed (1 in 10 chance), protecting the player from one life lost.

When all of the asteroids are destroyed, the enemy spaceship is spawned in but it cannot move or shoot. It can still have a collision with the player if hit directly (resulting in a death) and can still be shot by the player (destroying the enemy ship).

When the enemy ship is destroyed, the next round of asteroids then begin and the cycle continues, testing how long the player can survive for.

Appendix:

1)

A black background with white text

Description automatically generated

A black background with white text

Description automatically generated2)

A screen shot of a computer program

Description automatically generated3)

A screen shot of a computer code

Description automatically generated4)

A screen shot of a computer code

Description automatically generated5)

A computer screen shot of a black screen

Description automatically generated

A screen shot of a computer code

Description automatically generated6)

7)

A screen shot of a computer program

Description automatically generated