Class Diagram

-: Class Diagram :-

Board

has

Game Object

Asteroids   Player Ship   Bullet   Enemy Saucer

has

has

has

Big Asteroids   Big Saucer

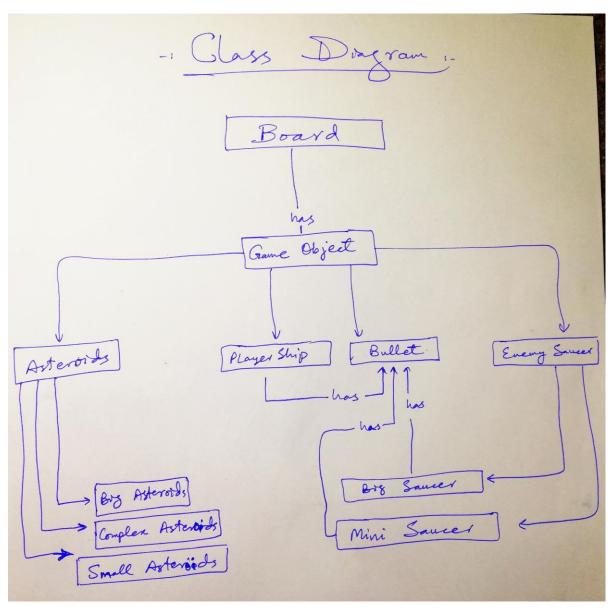Complex Asteroids

Small Asteroids   Mini Saucer

Polymorphic Array:

The whole game is controlled by polymorphic array named "pointer" which is created in the board class. It consists of various Game Objects. Game Objects are Player Ship, Enemy Saucers, and Asteroids. Polymorphic array contain Player Ship at zero index. At second and third index, there are Big Saucer and Mini Saucer respectively and rest all are asteroids like Big Asteroid, Complex Asteroid, and Mini Asteroid. At level 1, polymorphic array is of size 5 but it increases or decreases itself when the Game Object destroy.

Game Object Class:

Game Objects is the parent of all other classes like Player Ship, Asteroid, Big Asteroid, Complex Asteroid, Mini Asteroid, Enemy Saucer, Big Saucer, Mini Saucer and Bullet. It has all pure virtual functions.

It contains following functions:

- Draw()
- Move()
- Rotate()
- nextStateChecker()

Draw function is used for drawing shapes on the screen. All classes use the DrawLine() function to draw their shapes on the screen.

Child Classes:

Bullet class contain the centre point of the bullet and shooting angle.

Player Ship is the main object of the class. It composed the bullet class. It rotates, moves and shoots the bullets.

Asteroid class contain the common functionality of each type of asteroids. Big Asteroid, Complex Asteroid and Mini Asteroid are inherited from it. They have many other functionalities like rotation, movement.

Enemy Saucer is the parent class of Big Saucer and Mini Saucer. They have following functionalities like movements, shooting. Big Saucer and Mini Saucer are composed of Bullet.

Rotation:

Rotation is done with rotation matrix.

Movement:

Movement is done with velocity vectors i.e sin(theta) for x-axis and cos(theta) for y-axis.

Collision:

Collision is detected by using the Pythagoras theorem.