Project proposal

Roar of steel

Team members:

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Game idea:

This game is a (relatively) realistic naval combat game. In this game, the player is an admiral who commands a forward base and needs to build his fleet to protect himself and defeat the enemy.

Game settings:

The game wants to focus on combat and design ships, so we decide to simplify the resource aspect. There are Iron (mostly used for ship building), manpower (The sailor on ship), and experience (for research). Three resource has different way to produce (Or collect). Iron is produced by building factory at base. Manpower comes from your home land and increase as you control larger area, you can also rescue sailors from lifeboat after sunk a ship. Experience comes from combat, both deal damage and receiving damage gives you experience, destroy enemy ship gives more experience.

What we consider to be the "meat" of this game is the design part. Player need to allocate space of a ship body to different components. And there are many trade-offs in the design. For example, if you make larger cannon and engine, then the cost for armor will increase as you have to cover larger area. And if you increase armor, the ship became heavier and thus slower. Player can save their design and build it in the shipyard at base, and use it to defeat the enemy later.

Game goal: Destroy enemy base and protect your own.

Game object:

- Buildings: Base, Shipyard, Iron factory.
- Units: Because we have a built-in design part, there isn't a fixed number of units in game. But we planned to have 6 ship bodies (destroyer, light cruiser, heavy cruiser, battlecruiser, battleship, dreadnought) , torpedo (consider it as a very small ship with powerful melee range weapon) ,a lifeboat (hardly consider it as a unit because it doesn't move or do anything), and a collector ship. We will provide some pre-designed ship for new players and AI, but a ship designed by player may fits his play style better.
- And we have planned to add a giant robot as enemy ultimate unit. (and to meet the project requirement.)

Game Map: The map is separated into blocks, each block has 4 possible status

1. Sea. Allows movement, doesn't block sight
2. Land. Can't move through, doesn't block sight
3. Hill. Can't move through, block sight.
4. Mountain. Can't move through, block sight and shell.

Game systems:

1. Zone control: There will be several "key-points" on the map, you can capture it by send ship close to the point and claim control of that zone. This will increase your manpower income, and allows you to recycle the shipwreck in that zone.
2. Shipwreck recycle: Every ship sunk will transfer part of its iron cost to the zone pool, the player controls that zone can send collector ship to the key-points to collect the iron.
3. Refit: As your technology develops, the old ship doesn't get the new technology bonus, and this is when you need to send them to refit at shipyard. Refitting will cost a little iron and time, but will make your ship more powerful (usually).
4. Realistic firing: The ship can only fire with all turrets when firing at broadsides, and the cannon has certain hit chance related to the speed of both ships, the size of ship and cannon, the distance between two ships and so on. And there will be random accidents happen during combat.
5. Line-Of-Sight system: The ship in this game has a line-of-sight feature. So if there is a hill in between the ship and enemy, it won't be able to detect and fire at the target, unless there is another friendly ship can see the enemy ship. In this case we call it "indirect fire" and will receive penalty at accuracy.

Game structure:

Player class:

- Holds information about the player and his fleet. Including amount of resources, list of ships and buildings, list of designs, list of researches.
- Technology will be stored as an integer array in Player class, each integer indicates the level of one technology.

  Pseudo code:

  Variables:

  Int Player_ID;
  Player[] Friends;
  Player[] Enemies;
  Float Iron, man_power,experience;
  Ship_design[] designs;
  Ship[] Ships;
  Int[] Researches;

  Functions:

  Update();
  UpdateShip();
  BuildShip();

BuildBuilding();

Game class:

- The main control class for the entire game. Enemy AI are controlled in here.

  Pseudo Code:

  Variables:

  Player[] Players;

  Int Game_Status;//Controls the status of game (i.e. On menu, paused, in game, or ended)

  Functions:

  Mainloop();

  AI()

Ship class:

- Holds all the information about a ship. Including ship size, position, player, number of cannons, cannon damage, armor piercing value, torpedo, hitpoints, armor, speed, etc.
- Has method for firing, moving, and sunk. Ship AIs are in there too

  Pseudo Code: (Don't show the get/set methods as it looks duplicated,)

  Variables:

  Player owner;

  Int Hitpoints,Max_HitPoints:

  Int Main_cal,Sub_cal;

  Int Main_turret,Sub_turret;

  Int Armor,Max_speed;

  Float MainRange,SubRange;

  Float Cur_speed;

  Float[] position;

  Float direction;

  Bool is_torpedo;

  Functions:

  Attack(Ship s);

  Move();// Including path finding code

  Sink();

  Update();// Include code for target searching.

Ship Design Class:

- The ship blueprint is stored as a ship design object. There it stores the all design parameters of a ship. (pretty much what you can see in the ship design menu preview in the end of the proposal)

UI Class:

- The user interface for the game, including start menu, ship design menu, research menu and display some information like resource and mini map.

  Functions:

  Reset();//Sort like initialize game,. May take an integer as difficulty settings
  StartGame();
  OpenResearchMenu();
  OpenDesignMenu();
  OpenGameMenu();

Map Class:

- The data related to map, like strategy zones on map and terrains on map. But the collisions are processed by unity engine.

  Pseudo Code:

  Variables:

  Int[][] mapTiles;
  Float[X][2] Zones;
  Float[] Zone_resources;
  Float[][] Waypoints;//Some possible variables help for path finding

Building(not movable) Class:

- The buildings built on map. Like shipyard and factory. Life boats are also considered as a building for simpler code.

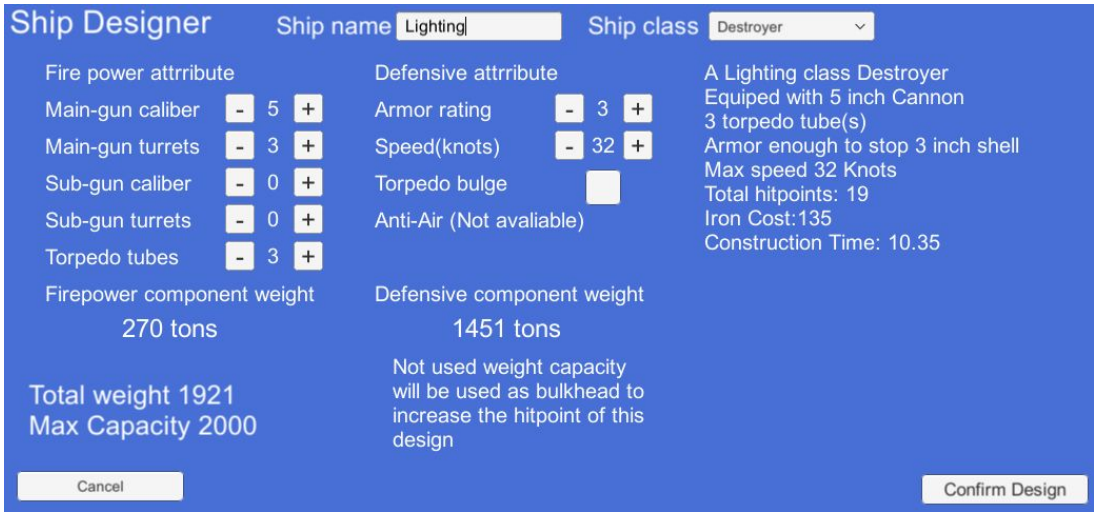
  Variables:

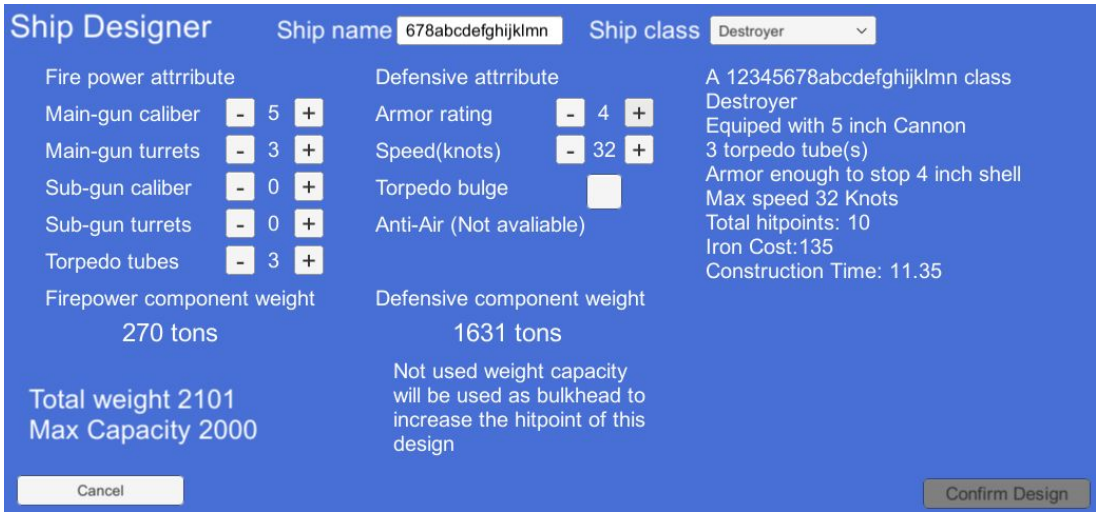
  Int Type;
  Float[] position;

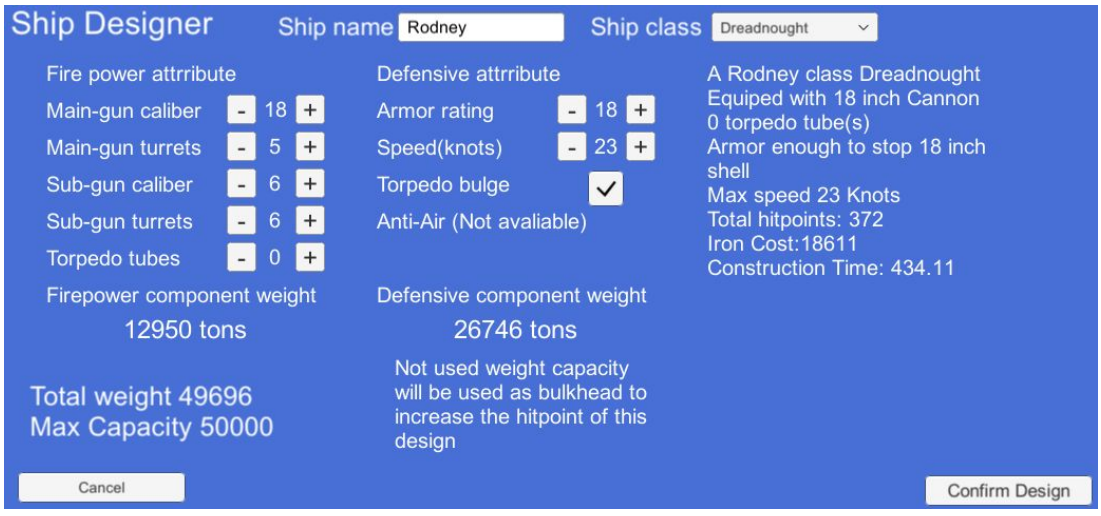
  Functions:

  Update();//Use a switch or if-statement to do different work based on different type;

Ship Design menu preview (the values may get rebalanced)

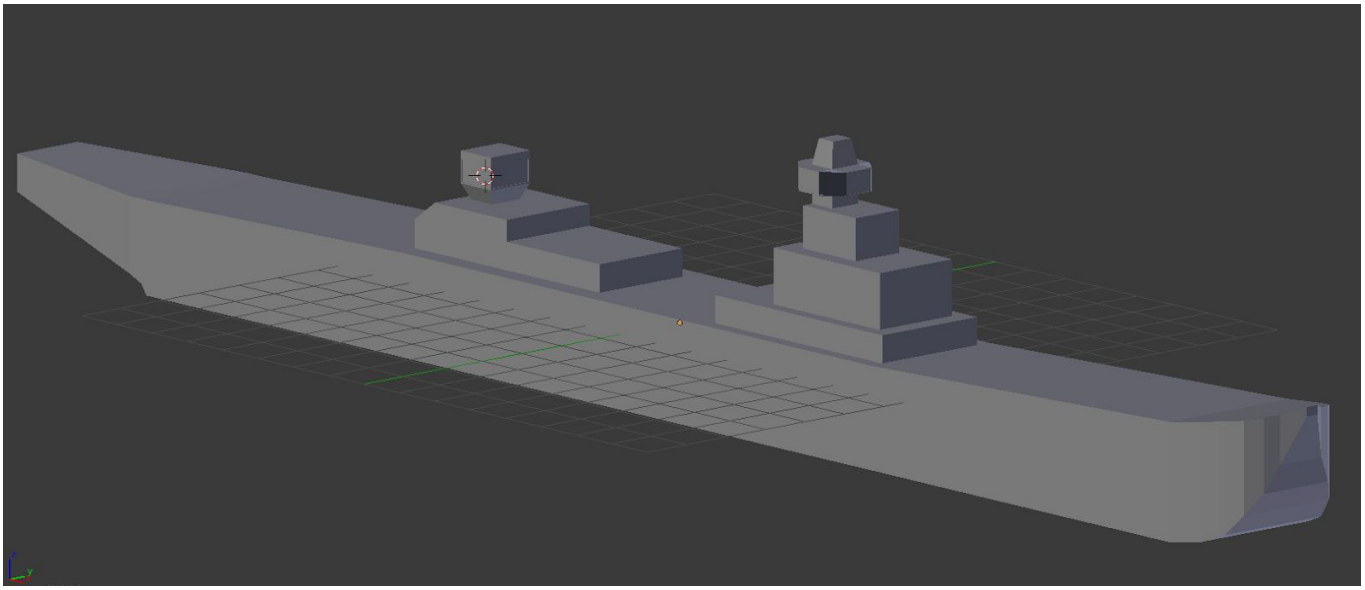




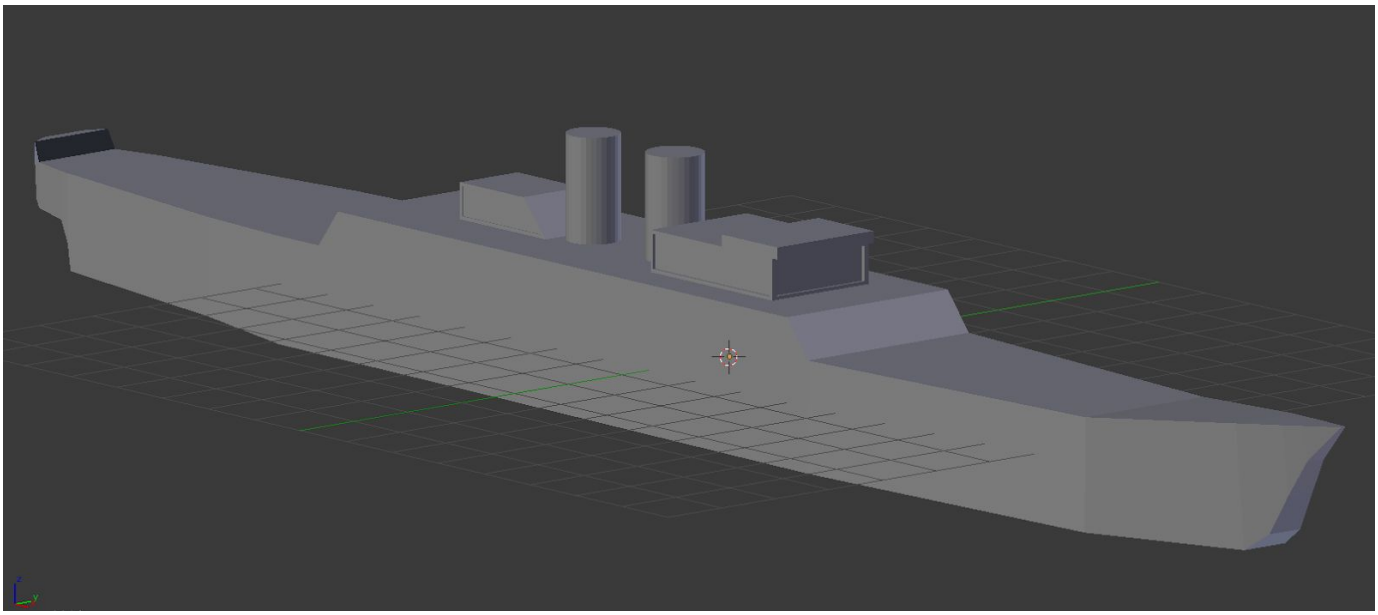


Some models of the ships.
Models created using Blender by Philip

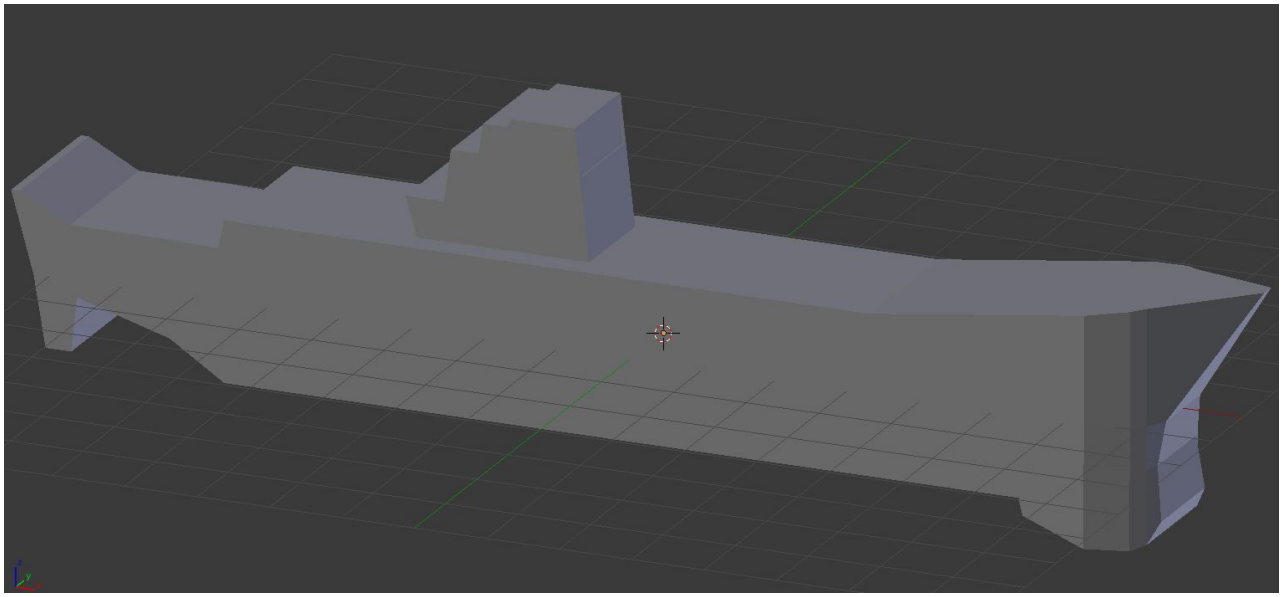
Heavy Cruiser



Light Cruiser



Destroyer



Dreadnought