

## Implementation Report

The modifications of the game for assessment 4 have two main parts: modifications to satisfy the new requirements, which is add a new type of crew member and add a new type of natural obstacle to the lake, and modifications to make the game more playable.

### Requirements changes:

For the new crew member requirement, we added an “engineer” (F11) in the game, which gives player the ability to repair their ship during combat. We added a new ‘attack’ button in the combat screen for the engineer’s to repair the ship, and this button will only show after the “engineer” has been unlocked. To balance the game, we designed that player will only be able to repair the ship if they have wood pieces, which could be purchased in any ally locations.

We have created two types of natural obstacles for the new requirements, a sea monster (F13) and a whirlpool (F14). Both of them are undefeatable as required and the whirlpool will always stay on the map, but the sea monster will disappear after the player triggers the event once. Using the physics system provided by LibGDX, events will be triggered when player meets the icons of events. The sea monster event, which will move randomly before being triggered, will lead player to a new screen to a mini game. The player is chased by the monster through obstacles and will lose gold and wood if they do not escape. The whirlpool has been implemented in the “update” method in the SailingScreen class based on the refreshing time “delta”. When player enters the whirlpool, the ship will lose health every second, and the speed of the ship will decrease until player leaves the event area. The whirlpool will automatically change it’s location every 15 second.

### Improvements:

To make the game complete and more playable, we added following features:

1. A scaled map (F17) to show all the land locations. The map can be open and close by pressing “M” in the sailing screen. When the map has been open, it collects the coordinates of events and player ship, and will show them on the map as they are. We want player get a clear idea of where they are going since player only have a restricted vision in the sailing mode.
2. A score board has been added in the game, and will show after player win the game to give the player more information, and make player want to play the game for multiple times. It can also be accessed from the main menu.

Player's score has been stored in a text file after they win the game, and is displayed when needed.

3. More text messages and dialogues have been added to the game for player's convenience, including the objective to win the game and introduction of how to use new features in the game.
4. Small changes and bug fixed:
  - a. Fixing the bug that healing buttons in department and college screen do not work.
  - b. Fixing the bug that ship will clip out of the edge of the map by rotating the ship against some islands
  - c. Making player able to access main menu during sailing mode
  - d. Clean up all the unnecessary testing feature in the game.
  - e. Clean up unused functions and codes in the project.
  - f. Changing the move speed for player. The old speed was too slow and will make player lose the interest.

**Class changing and creating Table** (in the code we added comments starting with "A4" for all the changes we made in this assessment):

Feature	Classes Created	Classes Modified
New Crew(engineer)	<i>-Repair</i>	<i>-SailingScreen -CombatScreen -Player -DepartmentScreen -CollegeScreen</i>
Sea monster	<i>-EventScreen -SailingMonster -Monster</i>	<i>-SailingScreen</i>
Whirlpool	<i>-SailingWhirlpool</i>	<i>-SaillingScreen</i>
Map	<i>-MapScreen</i>	<i>-SaillingScreen</i>
Scoreboard	<i>-ScoreboardScreen</i>	<i>-VictoryScreen</i>