1. **Technical Report**

This report should be a word-processed document of no more than about 1000 words (2 pages of A4)

* Provide a UML diagram (BlueJ style) of your project design showing relationships between classes

Diagram

Description automatically generated

* Identify THREE important design decisions which your team made in implementing this project.

1. We used *ASF*, *UFF* and *Destroyed as a* collection using Array List to develop the (Collection) class also when developing the force class to activate and assemble forces from the UFF that has been initially reserved in dock implementation of Array List made it easier to fetch and create relationship between the classes. Therefore, when the game will be played, it is required to activate the force; using the Array List player will be able to view and know which forces are ready for a battle, including a list of the defeated force which cannot be recalled or could be used in further battles. These Array List has been designed and implemented in *(Collection Class)*
2. We used Array List over HashMap this is because of the ease and accessibility which is included in the collection framework and it is also presented in the java.util.package. Using Array List we were able to retrieve the list items in the same order as it was inserted. By time team members were able to fetch any element while testing the code simultaneously that was possible due to array list implementation by just specifying the corresponding key required, however in the HashMap this was not possible as we had to remember the key to fetch the elements this made it tedious as it had to be remembered.
3. *WarBird, Starship and Wing* we used as an Inheritance class since the forces from the ASF after activation and assembling the forces from the dock can choose the three types of force to battle.

For EACH design decision:

* State your teams design decision

This team initially began working with the IntelliJ IDE that has been periodically updated starting from documenting the Testing Plan worksheet followed by the backend classes. Team chose three different Inheritance classes (Warbird, Starship and Wing) that inherits from Force class. These Array List also calls the WarChest function showing the amount of reward user has gained or loss after winning or loosing the battle. Collection class has been also developed that has relation with the force class as of using Array List methods will be called for knowing information regarding forces.

* Identify possible alternative implementations

HashMap’s were used in the Force and Battle class, but as an alternative Array List has been used to call the list of forces and battle.

* Discuss the pros and cons of your team’s decisions with reference to these alternatives

**Pros:**

**Array List over Hash Map Ease of Access:**

Array List was chosen as it allows random access from the array on indexes.

Therefore, using Array List, we can search faster value or the element that is required as they are synchronized, and it takes less memory than HashMap as it requires extra space to store the key and value since it the HashMap stores in two objects.

**Cons:**

**Time consumption:**

Due to the chosen alternative and disagreement with one of the group members, time was consumed to complete the collection class, where the team chose to use Array List to implement UFF, ASF and Destroyed collection.

* Explain the reasons for your team’s decision

Team decided to stick with Array List as an alternative, due to its advantage of re-sizable array list of the list interface given in the code, that ensures to maintaining the insertion type and can produce duplicate values if required.

Using Array List the team members were able to reduce errors while coding, these implementations were carried by mutually agreeing on the software IntelliJ IDE by the team members to code further. We chose the collection class (ASF, UFF and Destroyed) specifically to elaborate to the player while playing game the current and on-going statics of the game, where the user will be able to see the force activated and assembled, and the type of battle could be played by the force which required specific amount to deducted from the war chest before choosing.

As a Team we decided to held meetings in Microsoft Teams to discuss about the WIN coursework that was updated in an online software tool (Kanban) in which we periodically each week updated roles for each member of the team. Furthermore, the team decided to use GitHub online tool, as a repository for the WIN coursework in which as the task were completed by each member in the group, was uploaded in the repository as backup and everyone could access it. Hence the task was equally divided by the team members where everyone got equal chance in some parts of the coursework to contribute and share their way of methodologies to complete the coursework.