Functional Requirements

Main points
- Allow the user to decide how the program runs (Either as Design Mode or Real Mode)
- Allow the user to specify how many countries and alliances will be formed and the initial state of the countries.
- The program will need to run through the phases of the program by either accepting inputs from the user (design mode) or producing its own inputs to continue the program(real mode)
- Each country should be able to build their own army that will be used in a war. This includes flags, weapons, troops, soldiers and infantry.
- Countries should only be allowed to attack countries that are not in their alliance.
- Countries should have the choice to be able to form an alliance with other countries (phase 2).
- For any party to engage in warfare, their entities need to be entered into the war theatre.
- In the war Theatre, countries will compete against each other through their entities. Vehicles can only attack other vehicles and soldiers can only attack other soldiers. Attack damage is dealt and if a unit loses all their health they are eliminated.
- War Theatres will comprise of specific elements (land, sea or air, or a combination of elements). Only specific units can be deployed in the war theatre if their criteria are met. Eg Land for soldiers and tanks, sea for ships, air for planes.
- If units fall below a certain level, they are considered damaged/wounded. They will then need to be repaired/healed by a mechanic/medic.
- After a certain amount of time, alliances will engage in peace talks (phase 4). If peace talks are successful then will continue to diplomacy (phase 5), if they are unsuccessful, they will re-engage in combat.
- If diplomacy (phase 5) is successful the program ends and a victor is declared, if it is unsuccessful then the program returns to forming of alliances (phase 2)

Introduction
We were tasked to implement a war simulator that will model the various elements of war. This program should be able to   simulate a turn-based style

war that can take place between two countries. The war must take place within a specified location that can be defined as the war theatre. Each country will have its own assets, like the number of soldiers, weapons, medics, infantry etc. Below is a detailed description of the requirements for the simulator:

In Depth Description
Countries can be alone or part of an alliance (data structure)
Countries have:
- Soldier/armies/troops
- Weapons
- Flags

There are multiple alliances

5.1 War engine
Countries take turns **ordering attacks** on countries from other alliances, until **one alliance** (superpower country group) **remains**

5.2 Components (can add RnD to "upgrade" units) (Construction of new units)

5.2.1 War theatre
- List of defending countries (in same alliance)
- List of attacking countries (in same alliance)
- Location
- Area: Air space / land / sea

5.2.2 Transportation
- Transport **goods**(weapons), **people**(troops) and **services** (medics, engineers)
- Should be able to destroy transport

5.2.3 Entities
- Keep track of time elapsed
- Entities will all go through a timed process (eg: construction of a vehicle), after which the entity will be added to the corresponding country
- How aggressively countries respond to provocation and attack

5.2.4 Phases of war
- Phase 1 (Dispute): A dispute takes place between countries. The user specifies how many countries are involved in the conflict and how many alliances can be formed. The starting state of each country is also decided here, for example the military size and resources available.

- Phase 2(Conflict): The countries form alliances against one another. This can be done by the User or done randomly in the program.
- Phase 3(Fighting): In this phase there is direct conflict between the alliances. In turns the alliances will attack one another and damage will be caused to the defender. Resources will also be able to be managed before the end of a turn, this entails the maintenance of troops or vehicles, delivery for more units and ammunition and then the evacuation of refugees/POWs.
- Phase 4(Post-Conflict): In this phase direct fighting stops but resource management still takes place. This stage is entered if an alliance's units and/or resources are depleted or if they surrender. Negotiations between alliances take place at this stage to end the conflict. If the negotiations are successful, the war progresses to Phase 5. If negotiations are unsuccessful, then the war goes back to stage 3.
- Phase 5(Diplomacy): This is the final phase of the war where the dispute is settled. If diplomacy is successful, then the war ends. If diplomacy is unsuccessful and a new dispute arises then the war goes back to Phase 2 where alliances are reformed, and the war continues.

Influences on the above phases were drawn from the following article: https://web.mit.edu/cascon/warend.html

5.2.5 Changes to war engine
As **time progresses** and according to **other factors** countries should **behave differently**:
- On how they **spend money** (eg: they spend a lot of money in the middle of the war)
- Adopting **war treaties** (eg: they decide to adopt peace treaties towards the end of the war)
- On how aggressively the **respond to provocation or attack** (eg: if they know another country is weak, they might not respond on provocation)
- Countries can also **change or leave alliance** (eg: if they are losing, or if an ally has performed too many invasions)

5.3 War re-enactment
Interface where a user can run the war simulation
Should have 2 modes:
- **Design mode:** changes can be made on the fly
- **Real mode:** simulations are set up and run