## **Requirements for grading levels**

The following are requirements for different grades for completeness in milestones 2 and 3 (for milestone 2, the appropriate functionality must be modelled in the backend classes):

* Pass (>=50%)  
  + Player must be able to invade (attempting to conquer) enemy provinces
  + Player must be able to move troops between adjacent regions 1 turn at a time (do not need to implement movement of troops across multiple provinces for a pass)
  + Player must be able to recruit soldiers of any category (not necessary to consider money in pass-level, but it should take the appropriate number of turns)
  + Trivial but sensible implementation of battle resolver. For example (you may implement another sensible implementation, but you must be able to explain why it is suitable during your iteration demos):
    - Battle resolver: army strength calculated as the sum of *number of soldiers in unit x attack x defense* for all units in the army. Each army then has a uniformly random chance of winning calculated as: *army strength/(army strength + enemy army strength)*. The winning army eliminates a uniformly random proportion of the losing army from: *((winning army strength)/(winning army strength+losing army strength) x 100%)* to 100% of the losing army. The losing army eliminates a uniformly random proportion of the winning army from: 0% to *((losing army strength)/(winning army strength+losing army strength) x 100%)* to 100% of the winning army. A successful invading army should destroy the enemy army as per the spec, and move its soldiers into the captured province.
  + Offline multiplayer implemented - ending the turn should transfer control to the next faction of a human player
  + Player is able to save/load games
* Credit (>=65%)  
  + All requirements for a pass, and all of the following:
  + Player is able to move troops between multiple provinces at a time. All rules regarding movement of troops implemented (e.g. not being able to move units moved into a province conquered in the current turn)
  + Costs for soldiers are implemented, and money (gold) is implemented
  + Wealth and taxes mechanic is implemented
  + Can win the game by conquering all provinces, or lose the game by losing all provinces, and see an appropriate victory/defeat message
* Distinction (>=75%)  
  + All requirements for a credit, and all of the following:
  + Campaign victory and loss implemented fully, including conjunction/disjunctions of subgoals, and random selection of a campaign goal when starting a campaign
  + Implement main menu, including ability to choose factions from the main menu
* High Distinction (>=85%)  
  + All requirements for a distinction, and all of the following:
  + Soldier special abilities implemented
  + Strong progress towards full battle resolver implementation
* Full marks  
  + All requirements for a high distinction, and all of the following:
  + Full implementation of battle resolver (including all aspects within these such as inflicting of casualties, routing, etc...)
  + All functionality in requirements implemented correctly

The following special abilities should be available and implemented automatically.

* For all Roman legionary units: "Legionary eagle" - provides +1 morale to all friendly units in the province. For every legionary eagle lost to the enemy (by the unit being destroyed defending a province) all friendly units across all provinces suffer a 0.2 penalty to morale until the settlement is recaptured (down to a minimum of 1 morale)
* For all Gallic/Celtic Briton/Germanic berserker units: "Berserker rage" - unit receives infinite morale and double melee attack damage, but has no armor or shield protection, in all battles
* For all melee cavalry: "Heroic charge" - where the army has fewer than half the number of units as the enemy, this cavalry unit will double its charge attack damage, and have 50% higher morale
* For all pikemen or hoplite units: "Phalanx" - these hoplites or pikemen have double the melee defence, but half of the speed, as they are otherwise configured to have
* For all javelin-skirmisher units: "skirmisher anti-armour" - in ranged engagements, troops fighting these skirmishers only receive half the protection from armour they would receive otherwise
* For all elephant units: "Elephants running amok" - during any engagement with elephants, there is a 10% chance that the damage/casualties inflicted by a unit of elephants will instead be directed at a random allied unit which is still participating in the battle (as if the elephants were battling the allied unit directly)
* For all horse-archer units: "Cantabrian circle" - when enemy missile units engage this unit of horse archers, the enemy missile units will suffer a 50% loss to missile attack damage
* For all druid units: "Druidic fervour" - allied units in an army with druids enjoy a 10% bonus to morale, and enemy units suffer a 5% penalty to morale, whilst the druids haven't routed. The effect of this ability is amplified by scalar addition, and can be amplified up to 5 times (e.g. 2 druids results in allies receiving 20% bonus to morale and enemy units suffering 10% penalty, however 6 druids provides 50% bonus and 25% penalty respectively)
* For all melee infantry: "Shield charge" - for every 4th engagement by this unit of melee infantry per battle, the value of shield defense is added to this unit's attack damage value

Where both scalar addition bonuses (e.g. +1 attack damage) and multiplicative bonuses (e.g. 20% loss in speed) apply due to filling multiple categories (e.g. druids are both melee infantry and druids), the scalar addition bonuses are applied first.