ACiv Assumptions

Multiplayer:
- There is no LAN or online multiplayer available (At least for the time being as it is not within the scope). Multiplayer games will be played on the same machine. So in a 4 player game, 4 players are playing on 1 machine.

Turns:
- Because all players play on the same computer, each player has his own turn. During this turn, players can do everything, though the number of turns remaining until their units are produced will not be decremented until the end of the 'Super Turn' described below.
- After all the player turns pass, a 'Super Turn' will then take place. This turn will decrement all the player's unit production counters by one turn
- Players will be able to build cities and enter combat with other players during their own respective turns. The regaining of health for fortified units will also occur at this time.
  - Ie. if a player, during his or her "player" turn, moves his or her unit into a tile already occupied by another player, both units will engage in combat. If one unit is defeated, the winning unit will take over that square.

Movement:
- When a movable unit is selected, the squares that he can walk to in the rest of the turn will be highlighted for ease of visibility
- Movements will be able to be queued if a player orders a unit to move to a tile outside of its ability range. This unit will then automatically move next turn as far as it can towards the requested tile.
- Units will visibly "jump" from tile to tile along their movement path. (Ie they will not just "teleport" from tile to tile)
- Movement is affected by terrain. The movement cost to go across certain terrain is more than other terrain. For example, the movement cost across a mountain is 9 versus the cost of grass which is 3. This is a result of avoiding the use of double variables (use for travel modifiers such as roads) where they are not truly needed. For example, a road makes a tile only cost ⅓ units of travel in FreeCiv and a grassland costs 1. For our game a road will reduce travel to 1 and grassland will be 3 by default. Simply to avoid using more space for doubles when its not needed.
- Units are able to move onto a tile that has a greater cost than their movement range, for example, if a settler has a movement value of 3 and wants to move onto a mountain, it can do so, at which point all of its range has been used for the turn. Thus, if a unit has a low movement range and is surrounded by mountains (or other terrain of a higher cost), it will not be stranded.
- The above does not apply to units that have a current movement value of 0 (or less), for example a unit with a movement value of 3 wants to travel through a grassland and onto a mountain that is adjacent to it, it will not be able to reach the mountain in a single turn, the unit will cross into the grassland, costing 3 movement, at which point the unit will have a movement value of 0, so it will not be able to climb the mountain. The next turn, the unit will be able to climb the mountain for a movement cost of 9, at which point its movement value will be -6 and it will not be able to move again that turn.

Gameplay:
- The trade feature in freeCiv did not seem to be a vital aspect of gameplay and will not be included in our version of ACiv for the time being. We plan to replace the trade value on resources with a science value as surplus trade value in freeCiv gave a bonus to your researching ability. Therefore the science value will be used to increase your researching ability.
- As AI is not a feature we are considering for this iteration, the random spawning of pirates that exists in freeCiv will not be implemented in our version.
- Diplomacy was deemed to be too large of a feature in concurrence with the other features and infrastructure being created this iteration, and will not be included in this release.
- A player wins our version of ACiv by eliminating all other players' cities.
- If a player leaves the game, their buildings and units are all removed from the map world.
- Happiness was deemed to be a minor feature, and will not be included in this release. This means that players will have to balance between money and science, but will not have to worry about revolutions.

Cities:
- Each city will be able to expand after a certain level of food has been reached (10 x current level + 10). Expanded cities will not be any larger physically, but will change visually and they will have increased resource gathering as well as increased food, production and trade requirements.
- The number of resources a city can consume is limited to the current level of the city. A city of level 1 can

only consume from one resource. This excludes the tile which the city occupies, a city will also gather the resources that are on the tile it sits upon.

- The units a city can produce is dependent on the advancement of its research tree.
- Cities have access to tiles up to 2 away from itself, including travel diagonally from tiles. This creates a near circle on the grid.
- Building cities is instant and can occur every "Player Turn".
- Governors (predefined city managers) will not be included in this iteration.
- Once a city is established, there will be a list of resources within the city's radius that are available to be harvested. Players can then select which resource they wish to harvest (they can also select multiple resources as their cities level up) this is different from Civilization which provides you with a segment of the map which you click on to select the tiles you wish to use.
- Building settlers requires at least a level 2 city and when a settler is produced, the city will be reduced a level. Cities cannot reach level 0.

Research:
- Each player has their own research tree.
- Some Technologies require other technologies to be researched first. For example the alphabet is needed before being able to research writing.
- Every technology in the research tree takes a number of turns to research. For example, researching Bronze Working might take 10 turns.
- The number of turns it takes to research technology is derived from the player's current Science level. The higher a player's Science, the faster research is completed. This science level is increased by collecting the science resource.

Terrain:
- The movement cost of certain terrain is higher than others. (ie mountains will take multiple turns to move across) (See the movement section for more explanation)
- Maps in civilization can be small or very large, as a result, we want to optimize the way that we store the image information for tiles in the world. For this reason, tiles will not hold a reference to a graphic, instead a utility will be created that fetches the sprites given.
- Terrain will also now hold all of its values for resources.

Game:
- The map of the game is represented by a 2D tile array.
- Units and Cities will be stored in hash maps.
  - Unit hash map will be accessed through coordinate values and will contain an ArrayList of units corresponding to the units located on that tile.

  - Cities will be accessed through coordinate values and will contain City object corresponding to the city located at that tile.
- The GameEngine will be responsible for checking which player owns what units/cities and allowing/ restricting them from being modified accordingly.

Players:
- Players will hold a reference to their own units to ease in deletion if they decide to quit the game.

Combat:
- There is only one type of combat: A unit can collide with an array of other units. (An array size of one would represent a single unit on a tile, whereas an array of size > 1 would represent one or more units on the tile).
- Combat is preferentially done between the best units in each stack and then by the second best then the third, etc. These attacks are always received by the best unit that is still alive. This is done until all units on the tile have attacked or one side has lost all the units.
- Units defending a city will not actually be coupled to a city. Instead, they will simply be on the same tile as a city and get buffs (such as extra health at turn end) accordingly.