**Improvements recommended for the engine.**

In this documentation, our group (Tute08Group02) will try to list out our opinions on the game engine that was given to us for our Assignments.

**What improvements need to be made:**

* Iterating the map to find specific items / actors : A major problem we faced at the start of the assignment was the lack of method within the engine itself to know who / where each of the specific actors / items that we are looking for. This forced us to implement the functionality through a double for-loop which loops through the entire map within its x and y boundaries to do simple operations such as finding the dinosaurs within the map etc. While this method ultimately works, it might become a problem if we were to expand the project and either add more maps or make the current map much bigger. This would significantly increase the runtime and hampers the overall performance of our game (since this method is used by almost all the major functionalities that we implemented into the map.) thus leading to worse user experiences.

**The fix :**

The fix that we propose is to modify the gameMap class to allow us to store all instances of the specified type (actor/ground) along with its location into an ArrayList. This will be updated every round to get the latest locations of all the actors/ grounds. The getActor and getGround methods can be refactored and made so that they take in a parameter of the specific actor / ground that we are looking for and return the instance from the ArrayList. This prevents us from needing to iterate the map every-time we need to find the items which will significantly reduce the runtime and in turn make the user experience much better. A problem with this however is that (insert problem here)

* Checking adjacent actors / objects : Another inconvenience we faced when creating the game was the lack of method to check the surroundings of our actor. For example, when we were implementing the Allosaur’s attack action. We had to manually code it within the Allosaur class itself to check whether its x-1 (left) or x+1(right) contains a Stegosaur which they can fight. In the context of this assignment, this seems fine since only a limited number of functionalities require us to check the surroundings but for future users of the engine who might design more sophisticated games, they will find it very inconvenient to have to hard code these methods when they require it for more of their functionalities.

**The fix:**

The fix we propose is to add a method within the actor class (and for ground class) which checks each surrounding hex (i.e. (x,y-1),(x+1,y)) etc. This method can be reused by the user each time the player wants to look for the surroundings of the actors / grounds to implement functionalities such as (fighting an adjacent actor, trading with an adjacent merchant) which are fundamental in most games. This will also reduce the amount of repetitive code from the game designer thus making the design cleaner and easier to refactor in the future, A disadvantage of such implementation would be that it would force the actor/ground to check all possible hex when the game designer might just want it to check left and right ( player can only fight with enemies beside them but not in other directions) which will then lead us back to the same problem we had which is to implement those methods one by one in each of the classes which requires them.