Project proposal - Mirco Aresu 60/73/65283.

Project name: Achievement system

Software: Azure Cosmo DB, Unity

Description:

Creating a Database on **Cosmo DB** that implement an Achievement system and a Leaderboard that handle requests from one or multiple Games made in **Unity (C#)**.

Definitions:

A **user** defined by **nickname, name, id,** and **games played** (each game with his own achievement list)

Where an **achievement** is a goal reached by a user like "level 3 completed" or "drove for 100 m".

Where an '**achievement list**' from a '**game list**' is a 'finite list of achievements' of a singular game that a user unlocked or locked and follow this format:

- Consider a game with 10 level where each level is an achievement and a user reached level 7, the user has 7 achievements **unlocked** and 3 **locked**.
- Where an achievement has an integer **score** that represents the **score difficulty (easy5--15-20hard)**
- When a user unlocks an achievement, it must be added in the Database with a real time **timestamp**.
- Once that an achievement is unlocked then it **cannot be deleted** from an achievement list.

If the user closes the game and reopen it, also if local data of the game are reset, the achievement lists are not affected in the database and when logged, the user can see his achievement list ordered by unlock order(timestamp) in **real time**.

A **leaderboard** that highlights from a **list of players** a sort of **ranking system** based on how many games and achievements a player unlocked.

Each achievement will then have a Ratio based on rarity; a new Score is calculated as consequence from the leaderboard:

Score rarity = $Score\ difficulty \sqrt{\frac{Number\ of\ users\ with\ that\ game}{Number\ of\ users\ that\ unlocked\ that\ achievement}}$

Therefore, **Ratio** = $\frac{Score\ rarity}{Score\ difficulty}$

Tests will be simulated with many players.