CENG431 – Building Software Systems
Final Project
Group6

In this project we build a game called “LoL (League of Legends)”, which is an 1v1 auto battler game. In this project we use following patterns:

- Abstract Factory
- Strategy
- Singleton

This game is played with 2 users. Every users has a unique user-name. Giving a new user-name means that creating new user. At first 2 users enters their user-name. Then, they asked to create a Hero. After both users create their Hero, battle starts. Heroes hit each other by turns. Every Hero has its own attacking and defending strategy.

Every Hero has an Origin. Heroes and Origins can have their own Attack and Defense strategy. Means that every created hero has 2 attack and 2 defense strategy (1 come from Hero itself, 1 come from its origin). Heroes also have Critical Damage and a state which contains Attack Damage, Health Point, Initial Health Point and Critical Chance. These states differs from hero to hero.

Default Values for a Hero:
AD(Attack Damage), HP(Health Point), CC(Critical Chance), CD(Critical Damage)
Default Stats: AD: 100, HP: 1000, CC: 20%, CD: 2
Every Hero deals damage to enemy which equals to his AD (This differ according to heroes attack strategies). Hero can deal critical damage by CC chance. And Critical hit calculates as AD * CD. Heroes can defend some of the damage according to their defense strategy.

Hero strategies:

- **Cavalier (HP: 1200, AD: 85, CC: 20%, CD: 2):** Cavaliers take 20% less damage.
- **Assassin (HP: 750, AD: 120, CC: 30%, CD: 3):** Assassins deal 3x instead of 2x when they hit critical damage.
- **Knight (HP: 1200, AD: 90, CC: 20%, CD: 2):** Knights parry the whole damage with 5% chance. This chance increases by 1.3x every time they attacked.
- **God-King (HP: 1200, AD: 90, CC: 20%, CD: 2):** God-Kings executes the enemy while enemy has 25% Health Point.
- **Ranger (HP: 900, AD: 65, CC: 20%, CD: 2):** Rangers increases their Critical Chance by 1.4x every time they attack. If they have 100% Critical Chance, they increase their Critical Damage by 1.15x.
- **Sorcerer (HP: 1100, AD: 90, CC: 20%, CD: 2):** Sorcerers steal enemy’s Attack Damage by 5% every time they attack.
- **Demilitionist (HP: 1100, AD: 65, CC: 20%, CD: 2):** Demolitionists deals extra damage (which is equal to 3x of their AD) every 1 of 3rd attack.

Origin strategies:

- **Dragonslayer:** Dragonslayers execute the enemy by 2% chance. This chance gets multiplied by 1.4x every time they attack.
- **Eternal:** Eternals refuse to die when they are below 0 health for the first time and revives back with 40% of his initial health.
- **Nightbringer:** Lightbringers deal 2 times more damage when they are on their 35% health.
- **Lightbringer:** Lightbringers take 2 times less damage when they are on their 35% health.
- **Ironclad:** Ironclads ignores the damage and get healed as much as damage by 12.5% chance.
- **Forgotten:** Forgottens deal %8 of their health.
- **Trickster:** Trickster gamble, and deal extra damage by his Attack Damage to enemy or himself with 50% chance.

User has a user-name, win count, lose count and match records. Match record has id, winner player, loser player and attack count. Player has a user-name, hero name which contains Hero name and Origin Name and end state of hero. Users are stored in “users.json” and Match records are stored in “matchRecords.json”.

There is a statistics page with top 10 winners (Winners calculates by win rates which equals to win count / lose count) and a search option to see user’s match records. User can search his username and see all the matches he did with its enemy username, winner hero, loser hero and their end states.