

Project 2 Specification B -- Medieval Combat Tournament

Analysis

Problem Statement

Design a piece of software that simulates a medieval combat tournament, with entrants of different physical parameters and weapon choices. The entrants have two physical parameters -- strength, reach, and speed. The weapons have three archetypes -- long, medium, and short. Each weapon, regardless of archetype, has a defense and an offense bonus. To win a match in the tournament, a fighter must score 10 points of damage on his opponent.

The purpose of this program will be to create, record, and print an entertaining combat record to the console that shows the unique strengths of each kind of weapon. To facilitate this, each tournament shall have an associated Jester who will comment on the progress and outcome of a match.

A tournament will consist of 4 sub-tournaments -- a long-weapon tournament, a medium-weapon tournament, a short-weapon tournament, and a wild tournament where contestants may use any weapon they choose.

Parameter Specification

This section describes how different weapon archetypes do battle, and how a fighter's physical prowess factor into their ability to attack and defend.

Combat

Weapon-based combat takes place across two factors -- ratings and performance.

A weapon's **rating** symbolizes how well it can perform on attack or defense, recorded on a scale of 1 through 6. Greater ratings represent greater prowess in combat.

In each round of combat, a combattant will obtain **performance** from their weapon, both in attack and defense. For every point of attack or defense rating a weapon has, a six-sided die is rolled. The sum of these dice determines the total attack value or defense value that a fighter receives that round.

After values have been calculated, each fighter takes damage equal to his opponent's attack value minus his own defense value. Combat ends when a fighter has received 10 damage, and his opponent is declared the winner. If both combatants fall in the same round, the match is reset and continues until there is a one-sided victory.

Weapons

Weapons are broken down into three archetypes -- long, medium, and short.

Ratings

Long Weapons

Weapon Name	Attack Rating	Defense Rating
Halberd	3	0
Lance	1	2
Two-handed sword	2	2

Medium Weapons

Weapon Name	Attack Rating	Defense Rating
Staff	1	3
Hand-and-a-half sword	3	2
Rapier	3	1

Short Weapons

Weapon Name	Attack Rating	Defense Rating
Dagger	4	1
Cestus	5	0
Gladius	3	3

Fighters

Fighters have three attributes -- strength, reach, and speed. Each is measured on a scale of 1 to 10.

A fighter's strength is how much force their blows carry. In each round of combat, the stronger fighter gets an extra 1 point to their attack rating.

A fighter's reach is how long their limbs are. In each round of combat, the longer-reached fighter gets an extra 1 point to their defense rating.

A fighter's speed is how quickly they can move. If combat is taking place between two different weapon archetypes (such as a long weapon and a medium weapon), the fighter with the greater speed gets an extra 1 rating to both attack and defense ratings.

Jester

The Jester is a non-mechanical character who exists to commentate on the progress of matches. For each match, the Jester should remark on who he thinks will win the match based on physical attributes. After each match, the Jester should remark on whether or not an upset occurred. During each match, the Jester should comment when a fighter has received half of the damage he has available before losing.

Design

CRC Cards

Weapon
+ Store attack and defense ratings
+ Store archetype
+ None

Fighter
+ Store attributes
+ Compare self to other fighter
+ Calculate attack and defense performance
+ Weapon

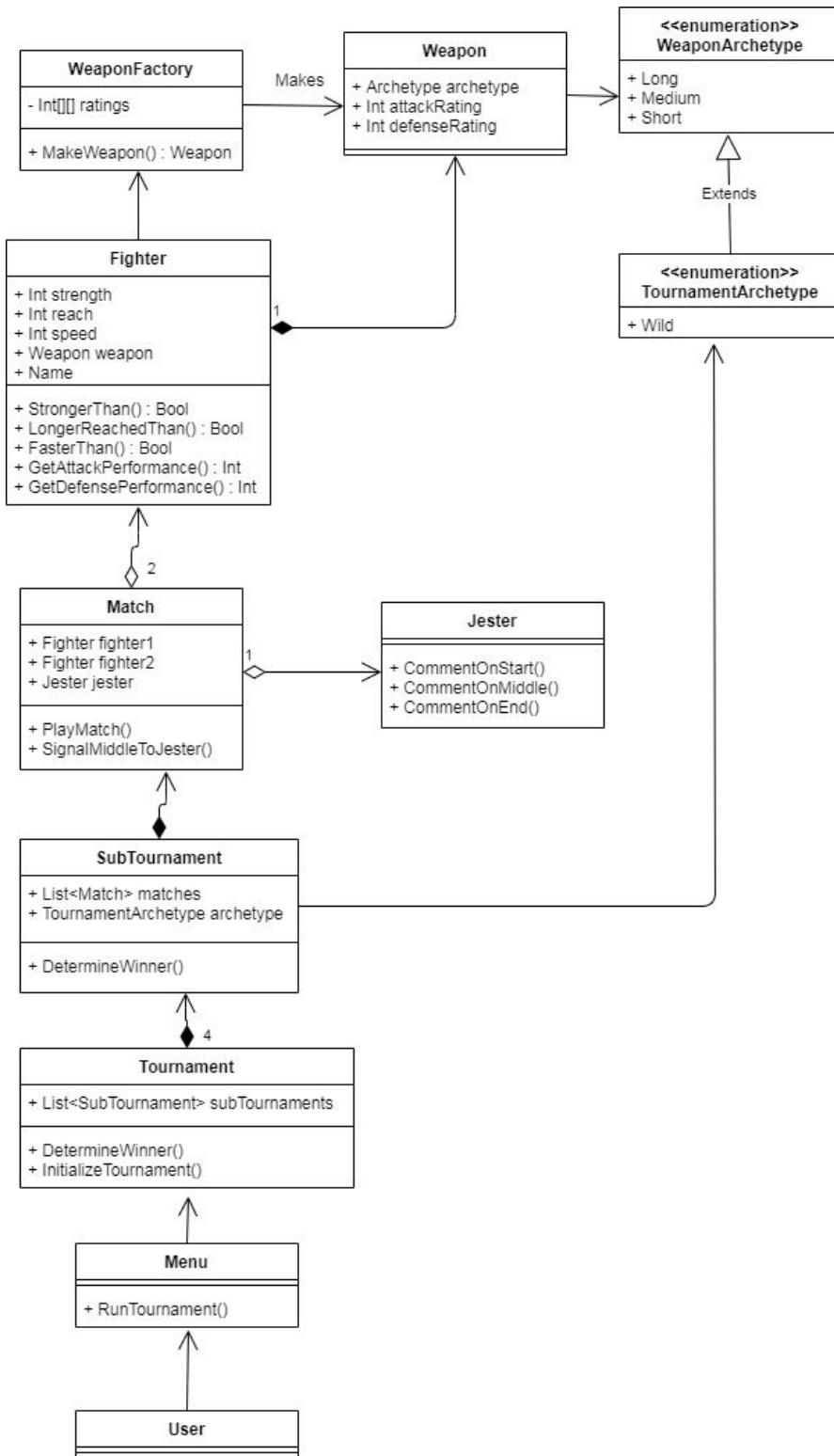
Match
+ Store fighters
+ Determine the winner of a fight
+ Use Jester to comment on match status
+ Fighter
+ Jester

Jester
+ Comment on match start, end, and halfway point
+ Fighter
+ Match

Tournament
+ Handle matches
+ Handle sub-tournaments
+ Store archetype
+ Determine Winner
+ Initialize tournaments with random fighters
+ Fighter
+ Match

Menu
+ Take in user input
+ Tournament
+ Match
+ Fighter

UML Diagram



Use Case

Case: User Runs a Tournament

1. Menu presents the user with a list of options.
2. The user indicates that they wish to run a tournament.
3. Menu asks the user for how many matches should be in each sub-tournament.
4. Menu tells Tournament to initialize.
5. Tournament creates the fighters for the fixed-archetype tournaments. Tournament gives them names, attributes, and weapons.
6. Tournament creates the fighters for the wild tournament. Tournament gives them names, attributes, and weapons.
7. Tournament composes the sub-tournaments into a single tournament.
8. Menu tells the tournament to find a winner.
9. The tournament runs each of its sub-tournaments to find semifinalists.
10. Each sub-tournament plays through its matches to find its winner.
11. The Jester comments on each match and prints its commentary to the console.
12. Each match runs through successive rounds of combat until a winner is found.
13. The sub-tournaments present their champions to the main tournament.
14. The main tournament has the semi-finalists fight using wild combat rules.
15. The main tournament has its finalists fight using wild combat rules.
16. The tournament presents its winner to menu.
17. Menu prints the winner to the console.