

Backend Developer Technical Test

Aequilibrium does love transforming... people, lives, teams, companies. And there's no better representation of transformation than Hasbro's Transformers, the classic television series featuring heroic Autobots raging their battle to destroy the evil forces of the Decepticons.

The Transformers are at war and you are in charge of settling the score! You're to create an API that evaluates who wins a fight between the Autobots and the Decepticons.

Please watch this video: <https://www.youtube.com/watch?v=nLS2N9mHWaw>

Overview

The goal of the technical test is to create a RESTful API. Your API should allow the following main functionality:

- Create a Transformer
- Update a Transformer
- Delete a Transformer
- List Transformers
- Given a list of Transformer IDs, determine the winning team

Transformer definition:

Each Transformer has the following criteria (ranked from 1 to 10) on their tech spec:

- **Strength**
- **Intelligence**
- **Speed**
- **Endurance**
- **Rank**
- **Courage**
- **Firepower**
- **Skill** The "overall rating" of a Transformer is the following formula: (Strength + Intelligence + Speed + Endurance + Firepower). Each Transformer must either be an Autobot or a Decepticon.

Determining the winning team:

Your API should take as input a list of Transformer IDs and based on input returns:

1. The number of battles
2. The winning team
3. The surviving members of the losing team

The basic rules of the battle are:

- The transformers are split into two teams based on if they are Autobots or Decepticons
- The teams should be sorted by rank and faced off one on one against each other in order to determine a victor, the loser is eliminated.
- A battle between opponents uses the following rules:
 - If any fighter is down 4 or more points of courage and 3 or more points of strength compared to their opponent, the opponent automatically wins the face-off regardless of overall rating (opponent has ran away)
 - Otherwise, if one of the fighters is 3 or more points of skill above their opponent, they win the fight regardless of overall rating
- The winner is the Transformer with the highest overall rating
- In the event of a tie, both Transformers are considered destroyed
- Any Transformers who don't have a fight are skipped (i.e. if it's a team of 2 vs. a team of 1, there's only going to be one battle)
- The team who eliminated the largest number of the opposing team is the winner

Special rules:

- Any Transformer named Optimus Prime or Predaking wins his fight automatically regardless of any other criteria
- In the event either of the above face each other (or a duplicate of each other), the game immediately ends with all competitors destroyed

Example:

For example, given the following

input: Soundwave, D, 8,9,2,6,7,5,6,10 Bluestreak, A, 6,6,7,9,5,2,9,7 Hubcap:
A, 4,4,4,4,4,4,4,4

The output should be: 1 battle Winning team (Decepticons): Soundwave Survivors from the losing team (Autobots): Hubcap

Requirements:

- API must be RESTful
- Delivered as a Java web app (Spring boot or Spring mvc). This must be created in at least Java 8
- The project must include unit tests (do not include integration tests)
- Short document explaining how to build and start the project. This Readme file should show:
 - How to build and run the unit tests
 - How to run the application
 - Include the API endpoints used with example (JSON) payloads
 - Any assumptions or notes to the reviewer
- A list of default transformers is created on startup: at least 3 Autobots, 3 Decepticons
- The project **must be uploaded** onto GitHub and have descriptive commit messages
- Only an in memory data repository should be used