

Problem statement:

Design a Magical Arena. Every Player is defined by a “health” attribute, “strength” attribute and an “attack” attribute - all positive integers. The player dies if his health attribute touches 0.

1)Any two player can fight a match in the arena. Players attack in turns. Attacking player rolls the attacking dice and the defending player rolls the defending dice. The “attack” value multiplied by the outcome of the attacking dice roll is the damage created by the attacker. The defender “strength” value, multiplied by the outcome of the defending dice is the damage defended by the defender. Whatever damage created by attacker which is in excess of the damage defended by the defender will reduce the “health” of the defender. Game ends when any players health reaches 0

2)Player with lower health attacks first at the start of a match.

3)Assume two players . Player A 50 health 5 strength 10 attack Player B 100 health 10 strength and 5 attack . Attacking die and Defending die are both 6 sided die with values ranging from 1-6

1)Player A attacks and rolls die. Die roll : 5 . Player B defends and rolls die. Die roll 2

2)Attack damage is $5 * 10 = 50$; Defending strength = $10 * 2 = 20$; Player B health reduced by 30 to 70

3)Player B attacks and rolls die. Die roll : 4. Player A defends and rolls die. Die Roll 3

4)Attack damage is $4 * 5 = 20$; Defending strength = $5 * 3 = 15$; Player A health reduced by 5 to 45

5)And so on

Source code:

```
import java.util.*;

public class Game {

    private Player playerA;

    private Player playerB;

    private Random random;

    public Game(Player playerA, Player playerB) {
```

```

        this.playerA = playerA;

        this.playerB = playerB;

        this.random = new Random();
    }

    public void start() {

        Player attacker = playerA.getHealth() <
playerB.getHealth() ? playerA : playerB;

        Player defender = attacker == playerA ? playerB
: playerA;

        while (playerA.getHealth() > 0 &&
playerB.getHealth() > 0) {

            int attackRoll = rollDice();

            int defenseRoll = rollDice();

            int attackDamage = attackRoll *
attacker.getAttack();

            int defenseStrength = defenseRoll *
defender.getStrength();

            int damageTaken = Math.max(0, attackDamage
- defenseStrength);

            defender.takeDamage(damageTaken);

            System.out.println(attacker.getName() + "
attacks with roll " + attackRoll +

                                ", " + defender.getName() + "
defends with roll " + defenseRoll +

```

```

        ", inflicting " + damageTaken + "
damage.");

        Player temp = attacker;
        attacker = defender;
        defender = temp;
    }

    System.out.println("Game over!");
    if (playerA.getHealth() <= 0) {
        System.out.println(playerB.getName() + "
wins!");
    } else {
        System.out.println(playerA.getName() + "
wins!");
    }
}

private int rollDice() {
    return random.nextInt(6) + 1;
}

public static void main(String[] args) {
    Player playerA = new Player("Player A", 50, 5,
10);

    Player playerB = new Player("Player B", 100,
10, 5);

    Game game = new Game(playerA, playerB);
    game.start();
}

```

```
    }  
}  
  
class Player {  
    private String name;  
    private int health;  
    private int strength;  
    private int attack;  
  
    public Player(String name, int health, int  
strength, int attack) {  
        this.name = name;  
        this.health = health;  
        this.strength = strength;  
        this.attack = attack;  
    }  
  
    public String getName() {  
        return name;  
    }  
  
    public int getHealth() {  
        return health;  
    }  
  
    public int getStrength() {  
        return strength;  
    }  
}
```

```
    public int getAttack() {  
        return attack;  
    }  
  
    public void takeDamage(int damage) {  
        health -= damage;  
    }  
}
```

Output:

Player A attacks with roll 1, Player B defends with roll 3,
inflicting 0 damage.

Player B attacks with roll 5, Player A defends with roll 3,
inflicting 10 damage.

Player A attacks with roll 2, Player B defends with roll 6,
inflicting 0 damage.

Player B attacks with roll 4, Player A defends with roll 1,
inflicting 15 damage.

Player A attacks with roll 1, Player B defends with roll 2,
inflicting 0 damage.

Player B attacks with roll 4, Player A defends with roll 5,
inflicting 0 damage.

Player A attacks with roll 2, Player B defends with roll 6,
inflicting 0 damage.

Player B attacks with roll 5, Player A defends with roll 5,
inflicting 0 damage.

Player A attacks with roll 3, Player B defends with roll 5,
inflicting 0 damage.

Player B attacks with roll 2, Player A defends with roll 5,
inflicting 0 damage.

Player A attacks with roll 3, Player B defends with roll 1,
inflicting 20 damage.

Player B attacks with roll 1, Player A defends with roll 6,
inflicting 0 damage.

Player A attacks with roll 3, Player B defends with roll 6,
inflicting 0 damage.

Player B attacks with roll 3, Player A defends with roll 4,
inflicting 0 damage.

Player A attacks with roll 3, Player B defends with roll 4,
inflicting 0 damage.

Player B attacks with roll 4, Player A defends with roll 2,
inflicting 10 damage.

Player A attacks with roll 4, Player B defends with roll 4,
inflicting 0 damage.

Player B attacks with roll 4, Player A defends with roll 6,
inflicting 0 damage.

Player A attacks with roll 1, Player B defends with roll 4,
inflicting 0 damage.

Player B attacks with roll 5, Player A defends with roll 2,
inflicting 15 damage.

Game over!

Player B wins!