

Bowling Alley

Write machine code for a single lane bowling alley system.

One bowling game will be played by multiple players on a single lane. During the game, players and their scores will be maintained and shown by the system and the winner will be declared at the end of the game.

Some rules about bowling:

- The Game of bowling consists of 5 Rounds.
- Each round consists of alternate plays (one by each player), and each player will have two chances to drop all the “pins”
- The score for a round is the total number of pins knocked down, plus bonuses for **strikes** and **spares**.
- A **strike** is when the player knocks down all ten pins on the first try. If there is a strike the player gets 10 bonus points.
- A **spare** is when the player knocks down all ten pins in two tries. If there is spare the player gets 5 bonus points.
- In the final round, a player who rolls a **spare** or a **strike** is allowed to roll extra 2 balls(not rounds) to complete the round. This allows for a potential of 7 strikes (5+2) in a single game.
- **Strike** is denoted by 'x' and **spare** is denoted by '/'. All other pin drop count can be denoted by 0 - 9 (for ex: 5, if five pins were dropped in a round)
- After the final round, display the Player list in ranked order on the basis of score.

Bonus Point: (Only Attempt If Time Permits)

Changing Bonus Rule: Bonus points are awarded, depending on what is scored in the next 2 balls (for a strike) or next 1 ball (for a spare).

Input:

No. of players

Score Input can be taken from fileInput or console.

Output:

Current position of the running games (Scoreboard) and after the final round, display players in ranked order on the basis of score.

Example:

Below example is for 3 Rounds

Input:

Number of players: 2

Round 1:

Enter Score for Player1 - Chance1: 8

Enter Score for Player1 - Chance2: 2

```
*****
Player1      Score Chance1 - 8pins   Chance2 - 2pin
*****
Scoreboard:
P1:   {8, /} -> 15 (10+5)
P2:   {}      -> 0
```

Enter Score for Player2 - Chance1: 10

```
*****
Player2      Score Chance1 - 10pins
*****
Scoreboard:
P1:   {8, /} -> 15
P2:   {X, }  -> 20 (10+10)
*****
```

Round 2:

Enter Score for Player1 - Chance1: 2

Enter Score for Player1 - Chance2: 7

```
*****
Player1      Score Chance1 - 2pins   Chance2 - 7pin
*****
Scoreboard:
P1:   {8, /}, {2, 7}      -> 24 (15+9)
P2:   {X, }, {}          -> 20
```

Enter Score for Player2 - Chance1: 6

Enter Score for Player2 - Chance2: 4

```
*****
Player2      Score Chance1 - 6pins   Chance2 - 4pin
*****
Scoreboard:
P1:   {8, /}, {2, 7}      -> 24
P2:   {X, }, {6, /}       -> 35 (20+10+5)
*****
```

Round 3:

Enter Score for Player1 - Chance1: 10

Enter Score for Player1 - Chance2: 8

Enter Score for Player1 - Chance3: 2

Player1 Score Chance1 - 10pins

Player1 Score Chance2 - 8pins Chance3 - 2pin

(Extra chance as all pins were dropped in last round)

Scoreboard:

P1: {8,/}, {2,7}, {X,}, {8,/} -> 59 (24+(10+10)+(10+5))

P2: {X, }, {6, /}, {} -> 35

Enter Score for Player2 - Chance1: 3

Enter Score for Player2 - Chance2: 4

Player2 Score Chance1 - 3pins Chance2 - 4pin

Scoreboard:

P1: {8,/}, {2,7}, {X, }, {8,/} -> 59

P2: {X, }, {6, /}, {3,4} -> 42 (35+3+4)

Final Output:

P1 - 59 points (winner)

P2 - 42 points

Example for bonus question:

Strike:

Round 1, ball 1: 10 pins (strike)

Round 2, ball 1: 3 pins

Round 2, ball 2: 6 pins

The total score from these throws is:

Round one: $10 + (3 + 6) = 19$

Round two: $3 + 6 = 9$

TOTAL = 28

Spare:

Round 1, ball 1: 7 pins

Round 1, ball 2: 3 pins (spare)

Round 2, ball 1: 4 pins

Round 2, ball 2: 2 pins

The total score from these throws is:

Round one: $7 + 3 + 4$ (bonus) = 14

Round two: $4 + 2 = 6$

TOTAL = 20

Evaluation criteria

- Demo-able code
- Separation of concerns
- Functional correctness
- Code readability
- Abstractions
- Entity Modeling
- Handling edge cases
- Usage of design patterns, where applicable
- Testability
- Language proficiency
- Design should be extensible.
- The code should be parameterized rather than hard coded.

Candidate Guidelines

- Please discuss the solution with an interviewer.
- Please do not access the internet for anything EXCEPT syntax
- You are free to use the language of your choice
- All work should be your own
- Please focus on the Bonus Feature only after ensuring the required features are complete and demoable.
- Once the code is complete please zip the source code and upload it to:
<https://docs.google.com/forms/d/e/1FAIpQLSfzz8HH6fLso7NLgqJ0kC0TYP-tZhC2XhTN4EdI2c6OC1v2XA/viewform>