CS 514 - Applied Artificial Intelligence

Project -1

Domain: Football Players Rating Evaluation

This AI rule-based method is intended to predict a football player's likelihood of fitting in well with the team. Each player in this system is required to pass three examinations, including a passing test, a pace test, and a fitness test. These three criteria have been taken into account because they are essential for playing football. In addition to these factors, the players' ages and relevant experience are also considered when determining their skill levels. Each factor has a different weighting and can be easily adjusted to meet the needs. The overall rating system is demanding since it calls for players to be exceptional in order to join elite clubs and advance their careers.

Features of the system

This AI system is created in a way to engage a user by letting the user enter specific scores. The system then computes the player's final rating and suggests whether he/she should be purchased to play for the team or not. The system's numerous input values include:

- Player's age
- Player's relevant years of experience
- Player's score on the pace test, between 1 and 10
- Player's score on the passing test, between 1 and 10
- Player's score on the fitness test, between 1 and 10

We execute the rule engine, which has rules pertaining to all possible combinations of values for these five parameters after we have collected all of the user scores. Based on the importance of each of these factors, the system assesses the employee's overall rating and makes a suggestion. As previously noted, the five factors are given various levels of importance or weight according to their logical value to the final grade.

The different weights given to these factors are

- Player's age: **15%**
- Player's relevant years of experience: **15%**
- Fitness Rating: **30%**
- Passing Score: **20%**
- Pace Score: **20%**

Knowledge Base

The knowledge base used by this AI system consists of the following:

Facts:

1. *Questions:* This comprises questions that are given an ***id*** to identify them and a type that indicates the kind of response the system anticipates. The different questions are:
    - What is the age of the player?
    - How many years of experience does the player have that is relevant?
    - What was the player's pace test score?
    - What was the player's passing test score?
    - What was the player's fitness test score?

Templates:

1. *Candidate template:* This template stores all the information for a player, namely their age, relevant experience, pace score, passing score, and fitness score.

```
(deftemplate candidate
(slot age (default 0))
(slot experience (default 0))
(slot pace-score (default 0))
(slot passing-score (default 0))
(slot fitness-score (default 0)))
```

2. *Question template:* This maintains the format in which the questions must be asked by the user.

```
(deftemplate question (slot text) (slot type) (slot ident))
```

3. *Answer template:* This is where the user-provided responses to the questions are kept.

```
(deftemplate answer (slot ident) (slot text))
```

4. *Rating template:* This contains the employee's final rating following computation and consideration of all relevant information.

```
(deftemplate rating (slot score))
```

5. *Recommendation template:* This stores the final recommendation and includes slots for the rating and the final recommendation.

```
(deftemplate recommendation (slot rating) (slot explanation))
```

Rules and Description

No.	Rules	Description
1	**ask-question-by-id**	Ask a question from the user
2	**welcome-user**	Prints the welcome message
3	**request-age**	Request the player's age
4	**request-experience**	Request the player's experience
5	**request-pace-score**	Request the player's pace-score
6	**request-passing-score**	Request the player's passing-score
7	**request-fitness-score**	Request the player's fitness-score
8	**assert-candidate-fact**	Assert the candidate's information
9	**rating-combination[1-19]**	**19 rules** to determine the rating and evaluation of the player
10	**check-experience**	Check if the experience value is logically correct with respect to the age
11	**print-result**	Print out the result of the player evaluation

Sample Test Cases:

1. Test Case 1
    - Age: **25**
    - Fitness test score: **8**
    - Passing test score: **9**
    - Pace test score: **8**
    - Years of experience: **7**

```
Type the name of the player and press Enter> Messi

Evaluation for Messi.

Please provide the required information for the football player.

What is the age of the player? 25
What was the player's fitness test score [Between 0 & 10] ? 8
What was the player's passing test score [Between 0 & 10] ? 9
What was the player's pace test score [Between 0 & 10] ? 8
How many years of experience does the player have that is relevant? 7
=== Player rating: 7
Explanation: Low Performance, Not Suitable for team
```

2. Test Case 2
    - Age: **35**
    - Fitness test score: **10**
    - Passing test score: **10**
    - Pace test score: **10**
    - Years of experience: **15**

```
Welcome to a system to evaluate football player!

Type the name of the player and press Enter> Ronaldo

Evaluation for Ronaldo.

Please provide the required information for the football player.

What is the age of the player? 35
What was the player's fitness test score [Between 0 & 10] ? 10
What was the player's passing test score [Between 0 & 10] ? 10
What was the player's pace test score [Between 0 & 10] ? 10
How many years of experience does the player have that is relevant? 15
=== Player rating: 9
Explanation: High Performance, Good Fit for team
```

3. Test Case 3
    - Age: **29**
    - Fitness test score: **9**
    - Passing test score: **9**
    - Pace test score: **9**
    - Years of experience: **12**

```
Welcome to a system to evaluate football player!

Type the name of the player and press Enter> Hakimi

Evaluation for Hakimi.

Please provide the required information for the football player.

What is the age of the player? 29
What was the player's fitness test score [Between 0 & 10] ? 9
What was the player's passing test score [Between 0 & 10] ? 9
What was the player's pace test score [Between 0 & 10] ? 9
How many years of experience does the player have that is relevant? 12
rating-combination7=== Player rating: 8
Explanation: Good Performance, Recommended for team
```

Key for running the tests:

- Try out any test case with fitness, passing, and pace test scores to be between 1 - 10.
- Player with a rating of **7 and below** is "Low Performance, Not Suitable for team".
- Player with a rating of **8** has "Good Performance, Recommended for team".
- Player with a rating of **9** is "High Performance, Good Fit for team".
- Player with a rating of **10** is "High Performance, Perfect for team".