Applied Artificial Intelligence Project -1

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Domain: Football Players Evaluation Engine (FPEE)

The rule-based expert system is designed using JESS Rule Engine and can predict whether a player is a good fit for the team. In this system, each player has to take three tests - a passing test, a pace test and a fitness test. I have considered these three parameters, as they are the basic requirements to play football. Apart from the above-mentioned parameters, I have also considered age and relevant experience as a factor in determining the players' ability. All factors do not carry the same weightage and are tweakable easily as per the requirements. The overall rating system is strict as it is required that players should be exceptional to get into top teams to improve them.

Structure of the system – The system was designed to interact with the user by letting the user enter certain scores, it then computes the final rating of the player and recommends if he/she should be bought to play for the team or not. The various input values to the system are:
- Age of the player
- Years of relevant experience
- Score on the pace test (1-10)
- Score on the passing test (1-10)
- Score on the fitness (1-10)

Once we get all the scores from the user, we now run the rule engine, which has rules pertaining to all the various combinations of values for these five factors. It evaluates the final rating of an employee based on the value of all these factors and gives the recommendation. As mentioned before different importance or weight given to the five factors depending on their logical importance towards the final rating.
The different weights I that I gave to these factors are:
- Age: 15%
- Years of experience: 25%
- Interview Rating: 30%
- Numerical Score: 15%
- Verbal Score: 15%

Knowledge Base: The knowledge base used by my system consists of the following:
Facts:
1. Questions: This consists of questions and these questions have an id to distinguish them and the type, which specifies what type of answer the system is expecting. The various questions are:
- Age - What is the player's age?
- Experience - How many years of relevant experience does the candidate have?
- Pace-score - How much did the candidate score on the pace test?
- Passing-score - How much did the candidate score on the passing test?
- Fitness-score - How much did the candidate score on the fitness test?

Templates:

1) Candidate template: This stores all the information regarding the candidate namely age, experience, pace-score, passing-score, 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 holds the questions in the format they have to be asked from the user.

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

3) Answer template: This stores the answers that are provided by the user corresponding to the questions.

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

4) Rating template: This holds the final rating which is given to the employee after the computation with all the details provided.

(deftemplate rating (slot score))

5) Recommendation template: This holds the final recommendation which has a slot for showing the rating and a slot which contains the final recommendation.

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

Test Cases:

1)


```
Welcome to the Football Player Evaluation Engine!
Type the name of the player and press Enter> TestCase1
Let us begin the performance evaluation for TestCase1.
Please provide the required information and the FPEE will tell you the rating and recommendation for the candidate.
What is the candidate's age ? 25
How much did the candidate score on the passing test? 9
How many years of relevant experience does the candidate have?   7
How much did the candidate score on the fitness test? 8
How much did the candidate score on the pace test? 8
*** The rating for this player is :7
Explanation: The player has a low rating and is not suitable for the team!
```

2)


```
Welcome to the Football Player Evaluation Engine!
Type the name of the player and press Enter> TestCase2
Let us begin the performance evaluation for TestCase2.
Please provide the required information and the FPEE will tell you the rating and recommendation for the candidate.
What is the candidate's age ? 30
How much did the candidate score on the passing test? 9
How many years of relevant experience does the candidate have?   16
How much did the candidate score on the fitness test? 9
How much did the candidate score on the pace test? 9
The value entered for the experience was incorrect, it does not seem logically correct with respect to the age you entered. Re-enter the details.
```

3)


```
Welcome to the Football Player Evaluation Engine!
Type the name of the player and press Enter> TestCase3
Let us begin the performance evaluation for TestCase3.
Please provide the required information and the FPEE will tell you the rating and recommendation for the candidate.
What is the candidate's age ? 28
How much did the candidate score on the passing test? 9
How many years of relevant experience does the candidate have?   12
How much did the candidate score on the fitness test? 9
How much did the candidate score on the pace test? 9
*** The rating for this player is :8
Explanation: The player has a good rating and is recommended for the team!
```

Valid cases:
- You can try out any test case with interview score, numerical score, verbal score between 1 and 10.
- Age suitable for paying football (I have kept the age bar high to accommodate other sports such as golf, which has higher retirement age if required).
- Relevant years of experience playing top level football, which should obviously be logical with respect to the age of the candidate (for example, a candidate can't be 25 years old and have 20 or 30 years of experience).

Expected Output:
- The expert system would give you a rating for the player and a recommendation whether the candidate would be a good fit for the team. The ratings range from 1-10, considering the immense amount of competition for in the football world, the system recommends only the candidates who have a rating of eight and above to give a real sense of the competition.

Instructions to run the system:
- Save the "football.clp" file in the "Jess71p2\bin\" folder on your local system.
- Go to the command line interface for Jess and execute the file using the batch command along with the correct location of the file on the system (batch "football.clp").