CS-514

Applied Artificial Intelligence

Project 1

Nike Shoe Recommender and Fitness Quotient

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Abstract:

Nike Shoe recommender is an expert system built in Jess that provides recommendation of Shoes based on type of activity that person practices, gender and price range of user. The system also advises of how much fit is the person is based on the BMI index and fat percentage.

Features:

- The system takes input from the user for the type of activity that user is fond of (eg basketball, soccer, tennis etc) , what is the persons gender and what is the price range that the user prefers and based on the input the system recommends some shoes to the user
- The system takes age, height and weight for calculation of fitness quotient of each individual and recommends weight to be reduced and amount of fat % in the body.
- Particularly the system recommends shoes for Nike as it contains the all the data for a single shoe manufacturer but it can be extended to any sport or fitness industry based on their factors.
- The system also can classify individuals based on different obesity levels based on the Body mass index for individuals
- The system suggests individuals to how much weight needs to be gained or lost based on normal BMI index of 18.5

Rules and Description:

#	Rule Name	Description	References and links
1	welcome	To give welcome banner to the user	
2	ask-question-by-id	to ask a question and assert it answer to the answer template	
3	request-budget	To ask range of budget for the user. There are two price ranges	
4	request-gender	To ask gender of the user	
5	request-activity	to ask activity of the user (ie: Basketball , Soccer , Running, Training , Tennis)	
6	request-weight	to ask weight of the user	
7	request-age	to ask the user for its age	
8	assert-user-fact	for asserting user fact from answer template to user template	
9	calculate-bmi-rating	it calculates BMI index , BMI rating , categorizes different body types, computes the fat percent and calculates the fat to be lost or gained based on different body types	BMI WIKI Body Fat percentage
10	recommend-1	it recommends shoes for specific category related to (male)(running)(range B)	Nike Shoes
11	recommend-2	it recommends shoes for specific category related to (male)(running)(range A)	Nike Shoes
12	recommend-3	it recommends shoes for specific category related to (male)(basketball)(range B)	Nike Shoes
13	recommend-4	it recommends shoes for specific category related to (male)(basketball)(range A)	Nike Shoes
14	recommend-5	it recommends shoes for specific category related to (male)(soccer)(range A)	Nike Shoes
15	recommend-6	it recommends shoes for specific category related to (male)(soccer)(range B)	Nike Shoes
16	recommend-7	it recommends shoes for specific category related to (male)(training)(range A)	Nike Shoes
17	recommend-8	it recommends shoes for specific category related to (male)(training)(range B)	Nike Shoes
18	recommend-10	it recommends shoes for specific category related to (male)(tennis)(range A)	Nike Shoes
19	recommend-11	it recommends shoes for specific category related to (male)(tennis)(range B)	Nike Shoes
20	recommend-12	it recommends shoes for specific category related to (female)(running)(range B)	Nike Shoes
21	recommend-13	it recommends shoes for specific category related to (female)(running)(range A)	Nike Shoes
22	recommend-14	it recommends shoes for specific category related to (female)(basketball)(range A)	Nike Shoes
23	recommend-15	it recommends shoes for specific category related to (female)(soccer)(range B)	Nike Shoes
24	recommend-16	it recommends shoes for specific category related to (female)(soccer)(range A)	Nike Shoes

25	recommend-17	it recommends shoes for specific category related to (female)(tennis)(range A)	Nike Shoes
26	recommend-18	it recommends shoes for specific category related to (male)(tennis)(range B)	Nike Shoes
27	recommend-19	it recommends shoes for specific category related to (female)(training)(range A)	Nike Shoes
28	recommend-20	it recommends shoes for specific category related to (female)(training)(range B)	Nike Shoes

Usage Manual

Instructions

Copy files nike_recommender.clp to the bin folder of jess directory

Open jess and execute the following commands

(batch nike_recommender.clp)

Validation and Assumptions

The system validates the input like age, gender, height, weight and price range

- The age is assumed to be of numeric type so it only accepts numeric value
- The gender is assumed to be either male or female so system accepts value of male or female
- Height is assumed to be in numeric and in inches, so that the calculations related to BMI , body obese type and fat percentage are calculated correctly.
- System takes only two values A or a ; B or b for the price range
- Weight is assumed to be in kgs and system accepts numerical value only.
- Although the system currently support only 5 (running, basketball, soccer , training, tennis) categories for activity and shoe recommendation but the scope can be expanded by adding more rules related to it.

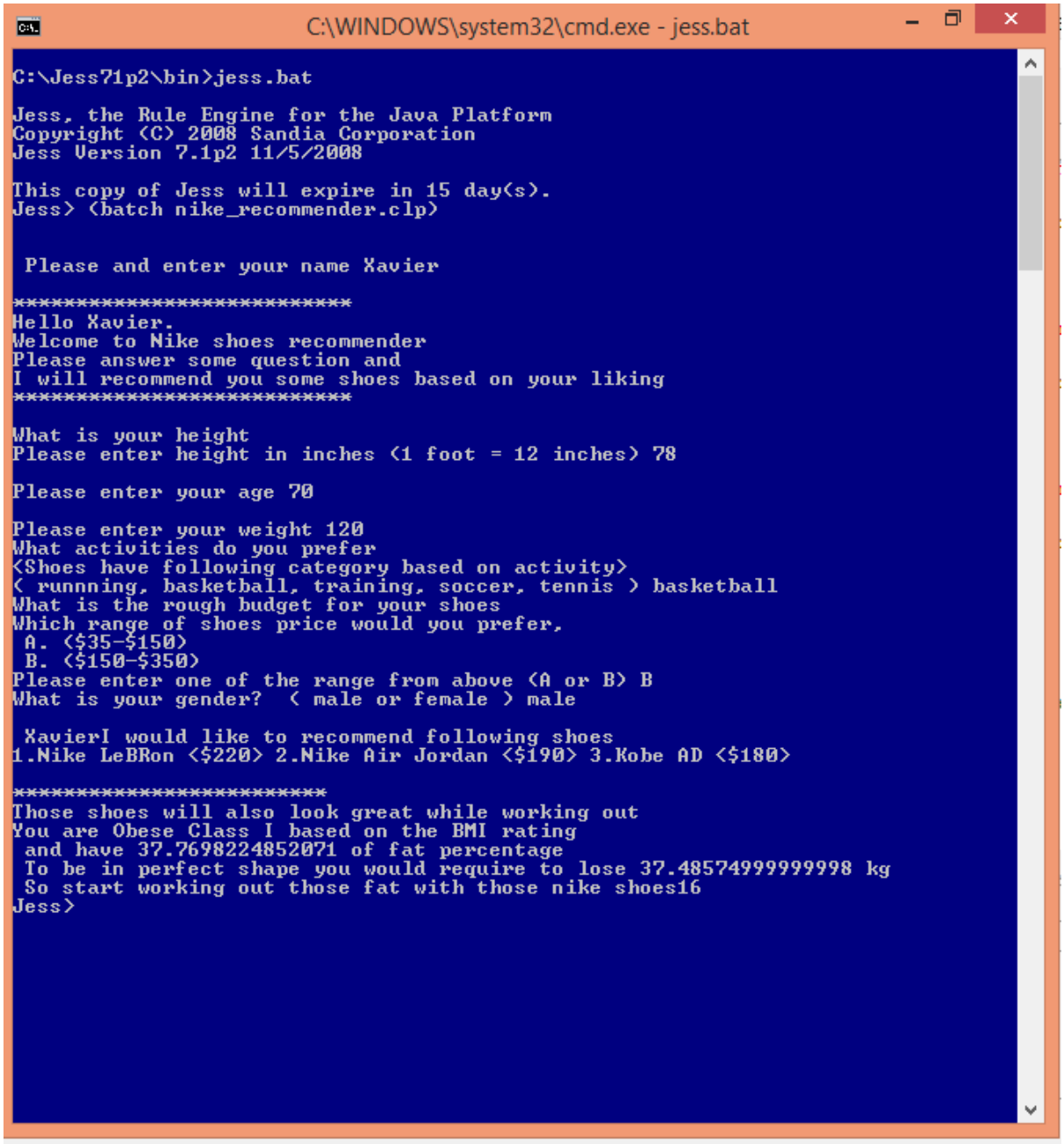
Future Score

- In future the recommender system can be expanded by using machine learning techniques that uses past history of users to make it more intuitive
- Although the project recommend shoes it can be extended to any sports industry or any categorization tasks that can be reduced to simple rule based.

Sample Runs

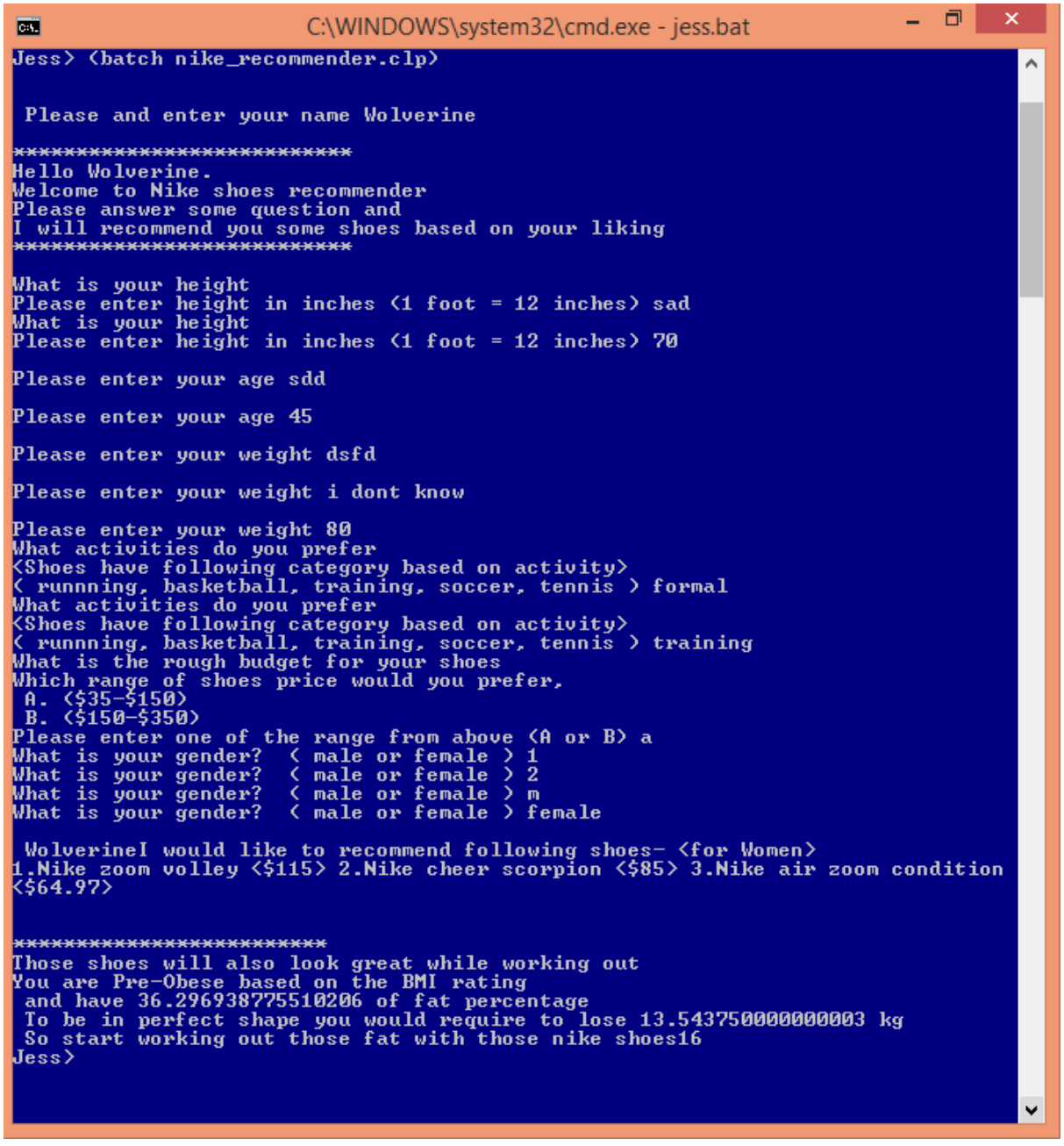
Run #1

It accepts all the input from the user (like name, age , height, weight , activity etc)so no assert command is required.



Run #2

The function is-type perform basic validation on the input so doing a one more run with different set of values.



So the parameter of age, height and weight are assumed of numeric type so it would not accept any character values. The price range has to be of A or B category although the system can accept lower case values. Similarly, the activity has to be from only the ones mentioned (ie. running, basketball, training, soccer, tennis)

Test Cases:

Test cases are supposed to be input values to the system only

- Name: Wolverine
  Height: 70
  Weight: 96
  Age: 45
  Gender: male
  Activity: tennis
  Price range: B

- Name: Tinker
  Height: 75
  Weight: 45
  Age: 20
  Gender: female
  Activity: running
  Price range: A

- Name: Lily
  Height: 45
  Weight: 85
  Age: 21
  Gender: female
  Activity: basketball
  Price range: B

- Name: Bella
  Height: 62
  Weight: 65
  Age: 23
  Gender: female
  Activity: soccer
  Price range: A

- Name: Tulip
  Height: 52
  Weight: 99
  Age: 21
  Gender: female
  Activity: training

Price range: A