STROKE RISK ESTIMATING EXPERT SYSTEM

Abstract:

This is a rule based expert system built on JESS that is designed to take fuzzy values of four measures of a patient's test results and estimate the degree of chances of a stroke. The system highlights the problems or the causes due to which it arrived to a conclusion.

Features:

The system uses the measure of the patient's blood pressure levels, BMI, sugar level and cholesterol (total i.e. LDL and HDL combined) levels. The system takes these measures as input. It assesses these measures to classify the degree of the probability of a stroke into the following classes:

Extremely Low Risk: The patient is perfectly fit and all the measures are in normal range.

Considerately Low: The important measures are in normal range, but some minor measures have abnormality.

Low Risk: Most of the important measures are in normal range except for 1-2. Minor test results are in normal range.

Considerate Risk: Some of the measures are not in normal range and can pose a risk if not heeded to.

Moderate Risk: Fair risk of a stroke since many of the measures aren't in normal range.

High Risk: Most of the important measure are not in normal range.

Extremely High Risk: All the vital measures are abnormal.

Rules and descriptions:

There are total 22 rules defined in the system:

#	Rule Name
1	getDetails
2	init
3	norAllbACH
4	norAllbLBP
5	norAllbHBP
6	norAllbLS
7	norAllbHS
8	norAll
9	norAllbABMI
10	hSughBP
11	hSuglBP
12	LSughBP
13	lSuglBP
14	aCHlBP
15	aCHhBP
16	hSaBMI
17	lSaBMI
18	aCHaBMI
19	aCHhS
20	aCHlS
21	hBPaBMI
22	lBPaBMI

Usage Manual:

Instructions:

Copy the file FuzzyStrokeRisk.clp to the BIN folder under the JESS directory.

Open JESS and execute the below commands:

```
(batch FuzzyStrokeRisk.clp)
```

Enter the details.

Note:

1. Kindly enter legitimate values for the details. Most of them (except first and last name) are prompted with appropriate range values (also given below). These values are case sensitive.
   - Blood pressure → high-normal-low
   - Cholesterol → high-normal
   - BMI → high-normal
   - Sugar → high-normal-low

Sample Test Case:

Input values entered are shown in green in the below screenshots

```
Jess, the Rule Engine for the Java Platform
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Jess Version 7.1p2 11/5/2008

This copy of Jess will expire in 1681 day(s).
Enter the patient's first name:
sdas
Enter the patient's last name:
dsadas
Choose the patient's Blood Pressure range (high-normal-low):
normal
Choose the patient's BMI range (high-normal):
high
Choose the patient's total Blood cholesterol level range (high-normal):
high
Choose the patient's Blood Sugar level range (high-normal-low):
normal
Considerate risk. Cholesterol level and BMI need to improve.
```

```
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This copy of Jess will expire in 1681 day(s).
Enter the patient's first name:
John
Enter the patient's last name:
Smith
Choose the patient's Blood Pressure range (high-normal-low):
high
Choose the patient's BMI range (high-normal):
high
Choose the patient's total Blood cholesterol level range (high-normal):
normal
Choose the patient's Blood Sugar level range (high-normal-low):
normal
Moderate risk. Blood Pressure level needs to decrease and BMI needs to improve.
```

```
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This copy of Jess will expire in 1681 day(s).
Enter the patient's first name:
Brad
Enter the patient's last name:
Pitt
Choose the patient's Blood Pressure range (high-normal-low):
low
Choose the patient's BMI range (high-normal):
high
Choose the patient's total Blood cholesterol level range (high-normal):
high
Choose the patient's Blood Sugar level range (high-normal-low):
normal
High risk. Blood Pressure needs to increase and cholesterol level needs to improve.
```