CS 514

Applied Artificial Intelligence

Project 1

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





