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Expert System for Diseases Identification

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➤ Group - 5
[Section-B]

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Objective

- To identify the diseases according to the symptoms which will be provided by the users as the inputs.
- To provide intelligence behaviour of the expert system in queries.
- Providing more accuracy in identification of diseases.
- Avoid the misinterpretations regarding the determination of the diseases.



Introduction

Introduction

- A huge figure of expert systems is medical.
- The chief aim of any medical expert system is identification and cure of diseases.
- A medical expert system is built up of programs and medical knowledge base.
- The information obtained from medical expert system is similar to the information given by proficient in that particular area.

Introduction (contd.)

- Medical Knowledge of specialized doctor is vital for the growth of medical expert system.
- This knowledge is composed in two phases.
- In the first phase, the medical conditions of diseases are recorded during the formation of personal meeting with doctors and patients.
- In the second phase, a deposit of rules is formed where each rule contains IF part that has the symptoms and THEN part that has the disease that should be realized.

Introduction (contd.)

- **Diseases to be identified:**

- ❖ Anemia
- ❖ Meningitis
- ❖ Measles
- ❖ Bronchitis
- ❖ Poisoning
- ❖ Rubella

- ❖ Flu
- ❖ Gastritis
- ❖ ORVI
- ❖ Laringitis
- ❖ Pharyngitis
- ❖ Migraine

Method

Programming Language Used:

CLIPS C Language Integrated Production System



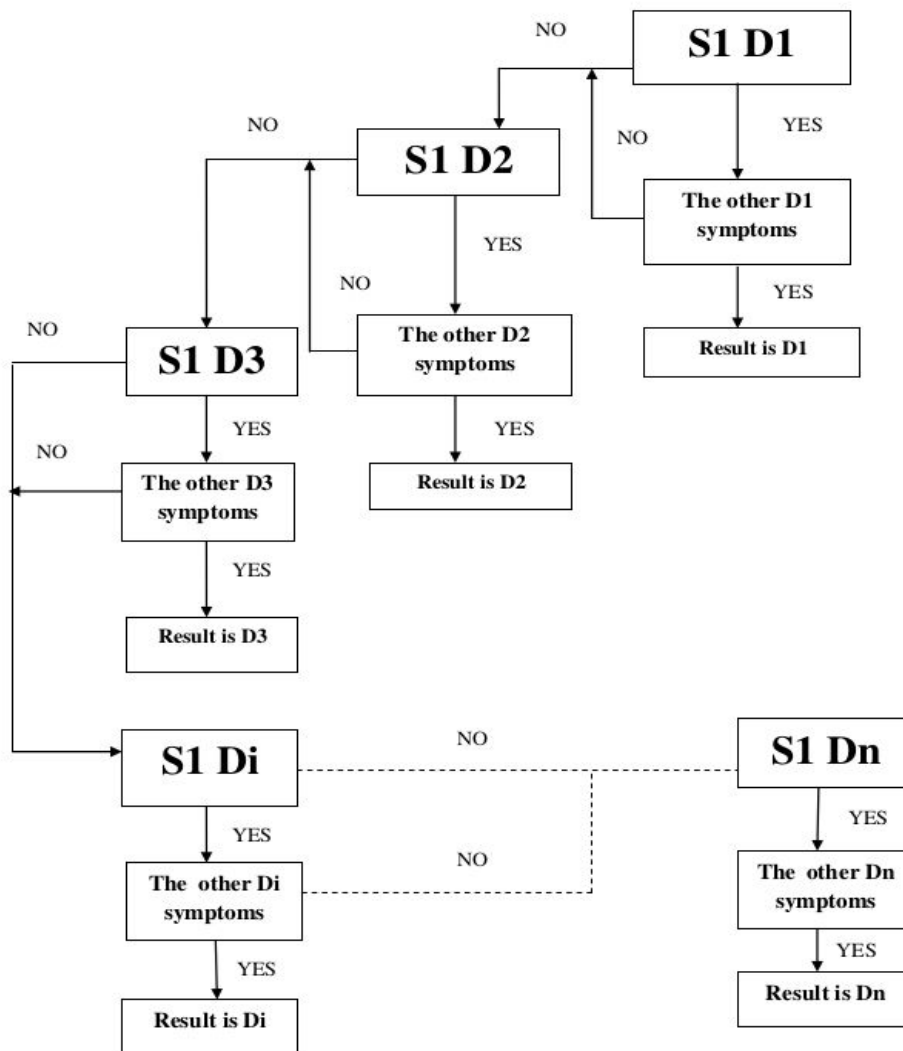
Implementation

Structure of Medical Expert System

- The Knowledge Base encloses information with reference to diseases which are characterized as a set of if-then production rules.
- The knowledge base is analogue to the long-standing human memory. The whole sorting of production rules is prepared in the knowledge base.
- The Fact Base contains facts which are applied to match in opposition to the antecedent part of rules stored in the knowledge base. The fact base is analogue to the instant human memory.

Structure of Medical Expert System

- The foremost job of Inference Engine is to bring out the reasoning by connecting the rules with facts and deducing new facts.
- The Explanation Module permits the user to inquire the expert system how a finicky conclusion is reached and why a specific fact is desired.



- In the figure, S1 D1 denotes the first symptom of first disease.
- In general Si Dj denotes the “i” symptom of “j” disease.
- If the program has a positive answer to the symptom, it goes on with the symptoms from that disease.
- If a symptom from that disease is negative, it jumps to the first symptom from the next disease.



Screenshots Of Prototype

Process To Identify:

Case 1:

The system will first check for Anemia. For Anemia it will ask for headache, weaknesses, paleness, faint.

But In this user have given “no” response for faint.

Then It will check for Meningitis. For Meningitis it will ask for rash,headache, vomit, weaknesses, cough, pain in muscles, Temperature.

Here all the symptoms of meningitis have satisfied so the output will be meningitis.

```
CLIPS> (reset)
CLIPS> (run)
Is there paleness? - yes - 1) no - 2) why - 3>()1
Is there faint? - yes - 1) no - 2) why - 3>()2
Is there rash? - yes - 1) no - 2) why - 3>()1
Is there headache? - yes - 1) no - 2) why - 3>()1
Is there vomit? - yes - 1) no - 2) why - 3>()1
Is there weaknesses? - yes - 1) no - 2) why - 3>()1
Is there cough? - yes - 1) no - 2) why - 3>()1
Is there pain in muscles? - yes - 1) no - 2) why - 3>()1
Is there temperature? - yes - 1) no - 2) why - 3>()1
This is meningitis, because you have temperature, headache, cough, pain in muscles, weaknesses, rash and vomit
CLIPS> 
```

Case 2:

This case will arise when there will be no symptoms of any disease then the Output will be “No Suggestion”.

```
CLIPS> !:~# sudo apt-get install shutter
(reset) package lists... Done
CLIPS> n(run)endecy tree
Is there spaleness? r-yesn-.1)Dnoe- 2) why - 3)()2
Is there rash? r-yeso+ 1)anoabl2) why +s3)()2rred to
Is there red eyes? +hyesa-k1)enos-m2)swhy, -h3)()2en o
Is there vomit? le yesm-a1)tnor-s2)rwhy - 3)()2
Is there sore throat? - yes - 1) no - 2) why - 3)()2
Sorry, there is no suggestion for installation candidate
```

Case 3 :

When user wants to know about the query like “Why this query has been asked ? ” then “why (3)” option will be chosen. It tells about the disease type.

The Relevant Screenshot is given below :

```
Is there paleness? - yes - 1) no - 2) why - 3>()1
Is there faint? - yes - 1) no - 2) why - 3>()3
There is suggest that you have anemia
Is there faint? - yes - 1) no - 2) why - 3>()2
Is there rash? - yes - 1) no - 2) why - 3>()1
Is there headache? - yes - 1) no - 2) why - 3>()3
There is suggest that you have a meningitis
Is there headache? - yes - 1) no - 2) why - 3>()1
Is there vomit? - yes - 1) no - 2) why - 3>()2
Is there running nose? - yes - 1) no - 2) why - 3>()3
There is suggest that you have a measles
Is there running nose? - yes - 1) no - 2) why - 3>()1
Is there weaknesses? - yes - 1) no - 2) why - 3>()1
Is there cough? - yes - 1) no - 2) why - 3>()1
Is there temperature? - yes - 1) no - 2) why - 3) ()1
This is measles, because you have temperature, cough, running nose, weaknesses and rash
CLTPS>
```


Conclusion

With using CLIPS [C Language Integrated Production System] we've successfully designed an Expert System for ***Diseases Identification***. Through this system we can specifically determine the diseases by analyzing the symptoms, provided by the users.

References

- Jimmy Singla, Dinesh Grover, Abhinav Bhandari, "Medical Expert Systems for Diagnosis of Various Diseases", International Journal of Computer Applications (0975 – 8887) Volume 93 – No.7, May 2014
- Rimpay Nohria, "Medical Expert System- A Comprehensive Review", International Journal of Computer Applications (0975 – 8887) Volume 93 – No.7, May 2014
- <http://www.clipsrules.net/>



Thank You

Any
Question?

