| 179        | Date//   |  |  |  |  |
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|            | Assignment-B2 when the manual of   |  |  |  |  |
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| *          | Title: Expert ystem.   |  |  |  |  |
|            | The state of the s |  |  |  |  |
| *          | Problem statement: - Implement on expert system for medical  |  |  |  |  |
|            | diagnosis of diseases based on adequate symptoms.  |  |  |  |  |
| ,          |  |  |  |  |  |
| *          | objectives! . To leasn and implement an expect system.   |  |  |  |  |
|            |  |  |  |  |  |
| *          | outromes: students will be able to 1-  |  |  |  |  |
| y. 4. **   | · learn and implement expert cyctem for Medical  |  |  |  |  |
| 310,00     | not appear in the siagnosistant design and halfthan and the  |  |  |  |  |
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| ha *       | soful and HIW Requisements:  |  |  |  |  |
| , 1-7      | • OS: 64-bit Ubunty 18.04.   |  |  |  |  |
| Averable   | · Programming languages: Pythonis  |  |  |  |  |
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| 0          | · Python3 library: Experta when Is a small white ships   |  |  |  |  |
|            | Salvet and the first and the f |  |  |  |  |
| *          | Theory   |  |  |  |  |
| 1          | • Expert Systems!  |  |  |  |  |
| 1 siriling | Diagnostic expert-based systems are computer systems   |  |  |  |  |
| - 1        | that seek to emulate the diagnostic decision-making  |  |  |  |  |
|            | ability of human expects. Medical expect systems generally   |  |  |  |  |
| · · · /    | including 2 components.  |  |  |  |  |
|            | a) trowledge Base: It enopsulates the evidence -based  |  |  |  |  |
|            | medical knowledge that is curated by expects.  b) Rule based inference engine: It is devised by the expect,  |  |  |  |  |
|            | which operates on the knowledge base to generate a   |  |  |  |  |
|            | differential diagnosis.  |  |  |  |  |
|            | - Medium died.   |  |  |  |  |
|            |  |  |  |  |  |



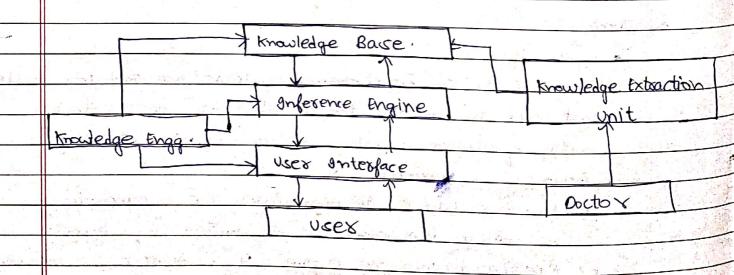
| Diagonictic knowledge bases generally consist of dise | ases,      |
|---|------------|
| findings (i.e. symptoms, signs, history or lab xes    |            |
| their relationships. In many cases, they explicitly   | Parout the |
|   |            |
| relationships between a set of findings and the       | mings that |
| cause them (diseases).                                |            |

relationships with fever, coughing and congestion.

## → Knowledge Base Design:-

The knowledge domain was got from facts of a collection of data about the types of symptoms & diseases to be isolated and identified, the identification methods, the expected results.

Data elicited fox the isolation, identification of ayomptoms and possible recommendations on sum susceptibility patterns makes the knowledge base which was modeled into frames at different levels of decision treas using the 'IF-THEN' production rules, quick deductions are made:



Date \_\_\_ /\_\_\_ /\_\_\_\_



|                |                  |                      |   | Notebook        |
|----------------|------------------|----------------------|---|-----------------|
|                | Representing d   | iseases and symptoms | IY.   | Self and the    |
|                | . 0              |                      |   | J. 1944         |
|                | label            | Disease 11 Mission   | Label   | symptom         |
|                | X                | Jandice              | 12  | Headache        |
|                | Xa               |                      | 32  | Back Pain       |
|                | Х3               |                      | 53  | Chest Pain      |
|                | Хч               | Tubercolosis.        | 54  | ough.           |
|                | ×s               | Asthma               |   | fainting.       |
|                | × <sub>6</sub>   | sinusitis.           | 56  | some throat.    |
|                | × <sub>7</sub>   | Epilepsy.            | 57  | Fatique.        |
|                | X <sub>8</sub>   | Heart Disease        | 48  | Retlessness     |
|                | Xq               | Diabetes             | La(69 40 10 10 10 10 10 10 10 10 10 10 10 10 10 | Low body temp   |
|                | X10              | alouroma             | ا   | Fevex.          |
|                | ׄ                | Hyperthyxodism       | ١١٧   | sunken Eyes.    |
|                | X12              | Heaxt stocke.        | SI2   | Nauxea.         |
|                | ×13              |                      | S13   | Blussed Vission |
|                |                  | Q'                   |   |                 |
|                |                  |                      |   |                 |
| *              | Test Cases'      |                      |   |                 |
|                | 300              | <u>ut</u>            | Output  | Result          |
|                |                  |                      | 4.  |                 |
| 1              | symptoms         |                      | antiforp.                                       |                 |
|                | cough:n          | Rack Adln:n          |   |                 |
|                | fevex:n          | Low Body temp: n     | flauroma  | Sulle .         |
|                | xectlessness:    | U                    |   |                 |
|                | some thorat:     | · ·                  |   |                 |
| - 7            | Fatigue:         |                      |   | 47              |
| - 1.<br>- 1 1. | Headache: y      | •                    |   |                 |
|                | sunken Eyes      | · \ \                |   |                 |
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| ع()         | symptoms -         | , eintyme how nos  | - 1 to 8 2 x ( \$) 1  |
|             | Headache: 4        | backfain:n   |   |
| 7           | bluxed vision = y  | Bung Ar Ballytamps UM  | race)   |
| -\#         | restlessness: y    | ough: y mast   | Probably success.   |
| 5-1-6       | Nausea: y.         | fever: n   | abeles  |
| × 14.34     | Fainting: y        | some threat: n. 11 1111  |   |
|             | Sunken Eges: y     | chest bain in  | . u/  |
|             | Fatigue: y         | law barly temp: n  |   |
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