Computer Science

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AIM

To create an expert system for medical diagnosis on the basis of symptoms and prescribe a suitable treatment.

PROGRAM

import java.io.*; class

Main

```java
{


public void dengue()

{ int

s=0;

String p,q;

String tr1="Medication: Painkillers like Tylenol or Paracetamol are generally prescribed to the patients. IV drips are sometimes supplemented in case of severe dehydration.";

String tr2="Stay hydrated: This is crucial as most of our bodily fluids are lost during vomiting and high fever. Continuous intake of fluids will make sure that the body does not easily dehydrate.";

String tr3="Hygiene: Hygiene is of the utmost importance, even more so when you are not well. The patient can opt for a sponge bath if not a regular bath. Add a few drops of disinfectant liquid like Dettol to the water being used for bathing. It is also advisable to sanitize your hand with a hand sanitizer like Dettol before and after visiting the patient in the hospital. Disinfect the water used to wash the patient's clothes with Dettol to rid the clothes of germs.";

System.out.println("Disease name: Dengue");

System.out.println(tr1);

System.out.println(tr2); System.out.println(tr3);

}


public void malaria()

{

String tr1="Chloroquine phosphate. Chloroquine is the preferred treatment for any parasite that is sensitive to the drug. But in many parts of the world, parasites are resistant to chloroquine, and the drug is no longer an effective treatment.";

String tr2="Artemisinin-based combination therapies (ACTs). ACT is a combination of two or more drugs that work against the malaria parasite in different ways. This is usually the preferred treatment for chloroquine-resistant malaria. Examples include artemether-lumefantrine (Coartem) and artesunate-mefloquine.";
```

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```java
String tr3="Other common antimalarial drugs include:Atovaquone-proguanil (Malarone),Quinine sulfate (Qualaquin) with doxycycline (Oracea, Vibramycin, others)and Primaquine phosphate";

  System.out.println("Disease name: Malaria");

System.out.println(tr1);

System.out.println(tr2); System.out.println(tr3);

}


public void tuber()

{

String tr1="If you have become infected with TB, but do not have the active TB disease you should get preventive therapy. This treatment kills germs that could cause problems if the disease becomes active. The most common preventive therapy is a daily dose of the antibiotic isoniazid (INH) taken as a single daily pill for six to nine months. You are not contagious if you have latent TB.";

System.out.println("Disease name: Tuberculosis");

System.out.println(tr1);

}


public void fluu()

{

String tr1="Rest more than usual and avoid exercise until symptoms are gone.";

String tr2="Drink lots of clear fluids (e.g., water, tea).";

String tr3="Stay away from cigarette smoke.";

String tr4="Do not take antibiotics unless specifically prescribed for you to cure the illness from which you currently suffer.";

String tr5="Avoid drinking alcohol because it weakens your immune system and may interact with medications";
```

```java
String tr6="Avoid caffeine, which can increase congestion and dehydration.";

String tr7="Eat a well-balanced diet, including fruits, vegetables, and grains.";

System.out.println("Disease name: Flu");

System.out.println(tr1);

System.out.println(tr2);

System.out.println(tr3);

System.out.println(tr4);

System.out.println(tr5);

System.out.println(tr6); System.out.println(tr7);

}


public void typhoid()

{

String tr1="Ciprofloxacin (Cipro). In the United States, doctors often prescribe this for adults who aren't
pregnant. Another similar drug called ofloxacin also may be used. Unfortunately, many Salmonella typhi
bacteria are no longer susceptible to antibiotics of this type, particularly strains picked up in Southeast
Asia.";

String tr2="Azithromycin (Zithromax). This may be used if a person is unable to take ciprofloxacin or the
bacteria are resistant to ciprofloxacin.";

String tr3="Ceftriaxone. This injectable antibiotic is an alternative in more-complicated or serious
infections and for people who may not be candidates for ciprofloxacin, such as children.";

String tr4="Drinking fluids. This helps prevent the dehydration that results from a prolonged fever and
diarrhea. If you're severely dehydrated, you may need to receive fluids through a vein (intravenously).";

System.out.println("Disease name: Typhoid");

System.out.println(tr1);

System.out.println(tr2);
```

```java
System.out.println(tr3); System.out.println(tr4);

}


public void cholera()

{

String tr1="For children of age<12: Doxycycline 2–4 mg/kg by mouth (per os, p.o.) single dose";

String tr2="For people of age>=12 including pregnant women: Doxycycline 300 mg p.o. single dose";

System.out.println("Disease name: Cholera");

System.out.println(tr1); System.out.println(tr2);

}

public void respiratory() {

  String tr1="Asthma. Inhalers and nebulizers are key components of asthma treatment. Long-term
asthma control medications include inhaled corticosteroids, leukotriene modulators (like Singulair) that
prevent asthma symptoms, theophylline, and long-term beta agonists, or LABAs, that relax airway
muscles (like Serevent). Combination inhalers include both a LABA and corticosteroid.";

  String tr2="Quick-relief or rescue asthma medications provide rapid, short-term symptom relief during
asthma flares. Albuterol and Atrovent are types of inhaled rescue drugs. Oral and IV steroids may be
prescribed on a short-term basis to treat severe asthma symptoms.";

  String tr3="COPD. A wide range of inhalers, nebulizers, oral medications and injections are used to treat
COPD, depending on severity and symptoms. Clinicians use guidelines from the Global Initiative for
Chronic Obstructive Lung Disease, known as the GOLD guidelines, to prescribe COPD medications.";

  String tr4="Idiopathic pulmonary fibrosis. Two oral medications are currently approved by the Food and
Drug Administration to treat idiopathic pulmonary fibrosis: pirfenidone
(Esbriet) and nintedanib (Ofev).";

  String tr5="Alpha-1 antitrypsin deficiency. Drugs are available where we functionally give people back
alpha-1 antitrypsin, Kuhn says. And you're actually able to augment their deficiency to some degree.
Augmentation therapy involves a weekly IV infusion, which some patients learn to manage at home.";

  String tr6="Cystic fibrosis. In October, the FDA announced its approval of a three-drug combination
called Trikafta as a breakthrough therapy for the genetic condition.";
```

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```java
  String tr7="Smoking cessation. It's critical for people with respiratory diseases to quit smoking and
avoid further compromising their breathing. However, it can be difficult for long-term smokers, who may
need medications and counseling to help them quit.";

  String tr8="Supplemental oxygen. People with advanced COPD or pulmonary fibrosis may benefit from
using supplemental oxygen to deliver enough oxygen to the body and help relieve their symptoms.";

  String tr9="Pulmonary rehabilitation. Pulmonary rehab is probably the most underutilized tool for
  COPD, Hogarth says. You're going to the gym with a trainer and insurance is paying for it, he says.
  Officially called medically supervised exercise, it involves up to 36 covered sessions with a certified
  program, offered in many hospitals and outpatient settings.";

System.out.println("Disease name: Respiratory Diseases");

System.out.println(tr1);

System.out.println(tr2);

System.out.println(tr3);

System.out.println(tr4);

System.out.println(tr5);

System.out.println(tr6);

System.out.println(tr7);

System.out.println(tr8); System.out.println(tr9);

}


public void diabetes()

{

String tr1="Controlling blood sugar (glucose) levels is the major goal of diabetes treatment, in order to
  prevent complications of the disease.";

String tr2="Type 1 diabetes is managed with insulin as well as dietary changes and exercise.";

String tr3="Type 2 diabetes may be managed with non-insulin medications, insulin, weight reduction, or
  dietary changes.";
```

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```java
System.out.println("Disease name: Diabetes");

System.out.println(tr1);

System.out.println(tr2); System.out.println(tr3);

}


public void pneumonia()

{

String tr1="Antibiotics. These medicines are used to treat bacterial pneumonia. It may take time to identify the type of bacteria causing your pneumonia and to choose the best antibiotic to treat it. If your symptoms don't improve, your doctor may recommend a different antibiotic.";

String tr2="Cough medicine. This medicine may be used to calm your cough so that you can rest. Because coughing helps loosen and move fluid from your lungs, it's a good idea not to eliminate your cough completely. In addition, you should know that very few studies have looked at whether over-the-counter cough medicines lessen coughing caused by pneumonia. If you want to try a cough suppressant, use the lowest dose that helps you rest.";

String tr3="Fever reducers/pain relievers. You may take these as needed for fever and discomfort. These include drugs such as aspirin, ibuprofen (Advil, Motrin IB, others) and acetaminophen (Tylenol, others).";

System.out.println("Disease name: Pneumonia");

System.out.println(tr1);

System.out.println(tr2); System.out.println(tr3);

}


public void covid()

{

String tr1="Rest. It can make you feel better and may speed your recovery.";

String tr2="Stay home. Don't go to work, school, or public places";
```

String tr3="Drink fluids. You lose more water when you're sick. Dehydration can make symptoms worse and cause other health problems.";

String tr4="Monitor. If your symptoms get worse, call your doctor right away. Don't go to their office without calling first. They might tell you to stay home, or they may need to take extra steps to protect staff and other patients.";

String tr5="Ask your doctor about over-the-counter medicines that may help, like acetaminophen to lower your fever.";

System.out.println("Disease name: Covid-19");

System.out.println(tr1);

System.out.println(tr2);

System.out.println(tr3);

System.out.println(tr4); System.out.println(tr5);

}

public static void main(String args[])throws IOException

{ int s1=0;

int s2=0;

int s3=0;

int s4=0;

int s5=0;

int s6=0;

int s7=0;

int s8=0;

int s9=0;

int

7

```java
s10=0;

int

max=0;

String inp[]=new String[5];

String[] den={"Eye pain","Rashes","Vomiting","Joint pain","Headache"};

String[] mal={"Fever","Chills","Headache","Muscle pain","Vomiting"};

String[] tub={"Cough","Fever","Chills","Night Sweats","Loss of appetite"};

String[] flu={"Fever","Headache","Cough","Pain","Fatigue"};

String[] typ={"Stomach pain","Headache","Cough","Loss of appetite","Diarrhea"};

String[] cho={"Diarrhea","Vomiting","Cramps","Thirst","Irritability"};

String[] res={"Cough","Runny nose","Sore throat","Pain","Fatigue"};

String[] dia={"Dry skin","Weight Loss","Increased urination","Feeling tired","Thirst"};

String[] pne={"Cough","Loss of appetite","Fever","Shortness of breath","Chest pain"};

String[] cov={"Fever","Cough","Feeling tired","Headache","Loss of taste"};

BufferedReader in=new BufferedReader(new InputStreamReader(System.in));

System.out.println("Enter 5 symptoms"); for(int i=0;i<5;i++)

{ inp[i]=in.readLine();

}


for(int a=0;a<5;a++)

{

String p=inp[a]; for(int

b=0;b<5;b++) {
```

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```java
String q=den[b];

if(p.equals(q)==true)

s1++; }}


for(int a=0;a<5;a++) {

String r=inp[a]; for(int

b=0;b<5;b++) {

String s=mal[b];

if(r.equals(s)==true)

s2++; }}


for(int a=0;a<5;a++) {

String t=inp[a]; for(int

b=0;b<5;b++) {

String u=tub[b];

if(t.equals(u)==true)

s3++; }}


for(int a=0;a<5;a++) {

String v=inp[a]; for(int

b=0;b<5;b++) {
```

```java
String w=flu[b];

if(v.equals(w)==true)

s4++; }}


for(int a=0;a<5;a++) {

String x=inp[a]; for(int

b=0;b<5;b++) {

String y=typ[b];

if(x.equals(y)==true)

s5++; }}

for(int a=0;a<5;a++) {

String e=inp[a]; for(int

b=0;b<5;b++) { String

f=cho[b];

if(e.equals(f)==true)

s6++; }}


for(int a=0;a<5;a++) {

String g=inp[a]; for(int

b=0;b<5;b++) {

String h=res[b];

if(g.equals(h)==true)

s7++; }}
```

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```
for(int a=0;a<5;a++) {

String k=inp[a]; for(int b=0;b<5;b++) { String l=dia[b]; if(k.equals(l)==true) s8++; }}


for(int a=0;a<5;a++) {

String m=inp[a]; for(int

b=0;b<5;b++) {

String n=pne[b];

if(m.equals(n)==true)

s9++; }}


for(int a=0;a<5;a++) {

String oo=inp[a]; for(int

b=0;b<5;b++) {

String pp=cov[b]; if(oo.equals(pp)==true)

s10++; }}


if(s1>s2)

max=s1;

else max=s2;


if(s3>max) max=s3;


if(s4>max) max=s4;
```

```java
if(s5>max) max=s5;

if(s6>max) max=s6;

if(s7>max) max=s7;

if(s8>max) max=s8;

if(s9>max) max=s9;

if(s10>max) max=s10;

System.out.println("Number of common symptoms= "+max);

Main ob=new Main();
if(max==s1) ob.dengue();
if(max==s2) ob.malaria();
if(max==s3) ob.tuber();
if(max==s4) ob.fluu();
if(max==s5)
ob.typhoid();
if(max==s6) ob.cholera();
if(max==s7)
ob.respiratory();
```

```
if(max==s8)

ob.diabetes();

if(max==s9)

ob.pneumonia();

if(max==s10) ob.covid();

}}
```

OUTPUT

```
> javac -classpath .:/run_dir/junit-4.12.jar:target/dependency/* -d . Main.java
> java -classpath .:/run_dir/junit-4.12.jar:target/dependency/* Main
Enter 5 symptoms
Fever
Headache
Eye pain
Joint pain
Vomiting
Number of common symptoms= 4
Disease name: Dengue
Medication: Painkillers like Tylenol or Paracetamol are generally prescribed to the patients. IV drips are sometimes supplemented in
 case of severe dehydration.
Stay hydrated: This is crucial as most of our bodily fluids are lost during vomiting and high fever. Continuous intake of fluids wil
l make sure that the body does not easily dehydrate.
Hygiene: Hygiene is of the utmost importance, even more so when you are not well. The patient can opt for a sponge bath if not a reg
ular bath. Add a few drops of disinfectant liquid like Dettol to the water being used for bathing. It is also advisable to sanitize
your hand with a hand sanitizer like Dettol before and after visiting the patient in the hospital. Disinfect the water used to wash
the patient's clothes with Dettol to rid the clothes of germs.
>
```

```
Enter 5 symptoms
Fever
Headache
Cough
Stomach pain
Rashes
Number of common symptoms= 3
Disease name: Flu
Rest more than usual and avoid exercise until symptoms are gone.
Drink lots of clear fluids (e.g., water, tea).
Stay away from cigarette smoke.
Do not take antibiotics unless specifically prescribed for you to cure the illness from which you currently suffer.
Avoid drinking alcohol because it weakens your immune system and may interact with medications
Avoid caffeine, which can increase congestion and dehydration.
Eat a well-balanced diet, including fruits, vegetables, and grains.
>
```

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