

Mother Follower Expert System

CPCS-331-PROJECT





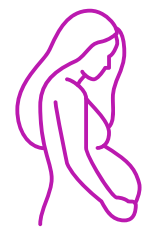
▶ **TABLE OF CONTENT:**

- ▶ Introduction
- ▶ Rules
- ▶ Flowchart
- ▶ Implemented methods
- ▶ Result



**Mother Follower
Expert System**

01



Mother Follower
Expert System

Introduction



Purpose of the System

Our system aims to follow up with the expectant mother during her pregnancy, describing what she needs in terms of treatments, nutritional supplements, and advice that will help her have a healthy and comfortable pregnancy for her and her fetus.



Users of the System

- The woman who is planning to be pregnant
- The pregnant woman



▶ **Expert of the System**

Describe the appropriate treatments, nutritional supplements, and advice for the expectant mother based on the duration of her pregnancy and the symptoms she feels through her answers to several questions.



▶ **Used Resources**

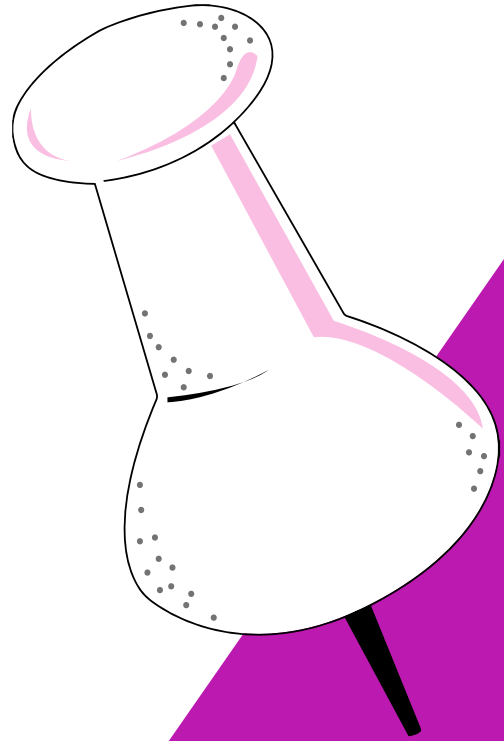
- You and Pregnancy Application.
- Gathering information by asking our mothers and friends who have experience with pregnancy, by benefiting from what they went through and the pieces of advice of their doctors during pregnancy.

02



Mother Follower
Expert System

Rules



RULE 1

R1: If the mother's answers are limited to:

- first trimester (0-12 weeks)
- No, I don't take.

Then, the answer is "You should take prenatal vitamins and folic acid".



RULE 1.1

R1.1: If the mother's answers are limited to:

- first trimester (0-12 weeks)
- Yes, I take.

Then, the answer is "That is so good".



RULE 2

R2: If the mother's answers are limited to:

- first trimester (0-12 weeks)
- Yes, I have experiencing morning sickness.

Then, the answer is "Recommend taking ginger supplements to alleviate nausea".



RULE 2.1

R2.1: If the mother's answers are limited to:

- first trimester (0-12 weeks)
- No, I have not experienced morning sickness.

Then, the answer is "That is so good".



RULE 3

R3: If the mother's answers are limited to:

→ second trimester (13-27 weeks)

→ Yes, I have low iron levels.

Then, the answer is "Prescribe iron supplements to prevent anemia."



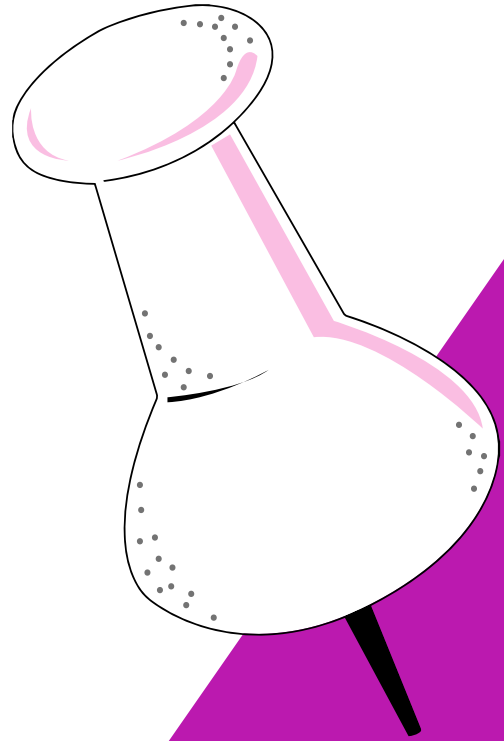
RULE 3.1

RR3.1: If the mother's answers are limited to:

→ second trimester (13-27 weeks)

→ No, I do have not low iron levels.

Then, the answer is "That is so good."



RULE 4

R4: If the mother's answers are limited to:

- third trimester (28-40 weeks)
- Yes, I have experiencing heartburn.

Then, the answer is "Advise avoiding spicy and greasy foods and recommend taking antacids after meals".

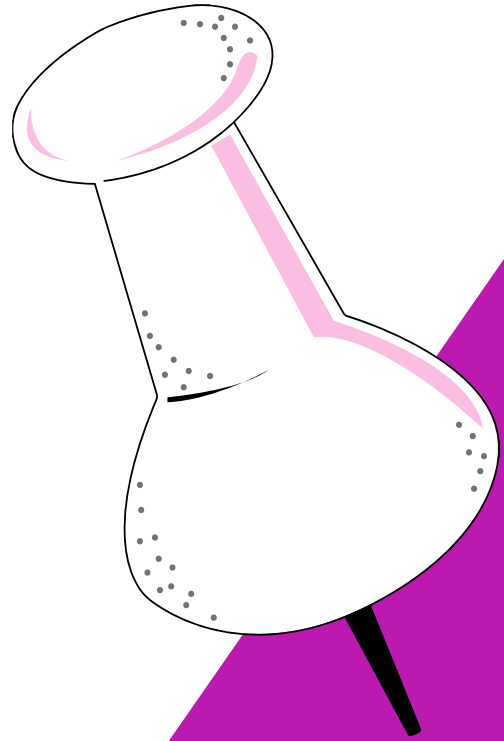


RULE 4.1

R4.1: If the mother's answers are limited to:

- third trimester (28-40 weeks)
- No, I have not experiencing heartburn.

Then, the answer is "That is so good".



RULE 5

R5: If the mother's answers are limited to:

→ second trimester (13-27 weeks) or third trimester (28-40 weeks)

→ Yes, I have gestational diabetes.

Then, the answer is "Recommend a balanced diet with controlled carbohydrate intake and regular exercise".



RULE 5.1

R5.1: If the mother's answers are limited to:

→ second trimester (13-27 weeks) or third trimester (28-40 weeks)

→ No, I have not gestational diabetes.

Then, the answer is "That is so good".



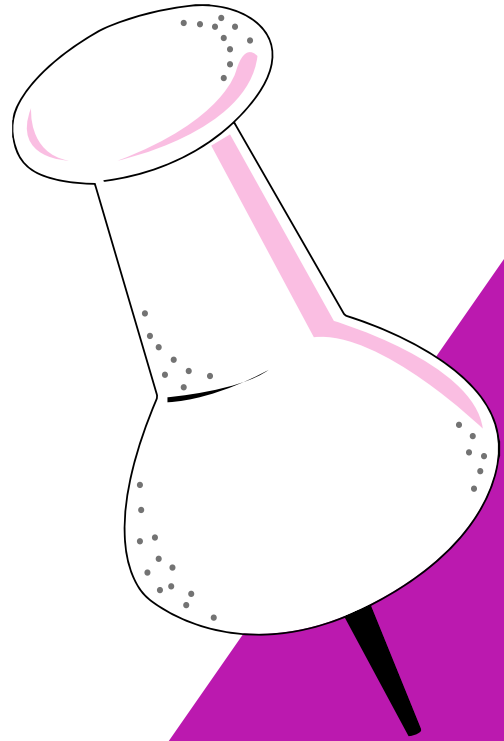
RULE 6

R6: If the mother's answers are limited to:
→ second trimester (13-27 weeks) or third trimester (28-40 weeks)
→ Yes, I have constipation.
Then, the answer is "Advise increasing fiber intake and drinking plenty of water".



RULE 6.1

R6.1: If the mother's answers are limited to:
→ second trimester (13-27 weeks) or third trimester (28-40 weeks)
→ No, I have no constipation.
Then, the answer is "That is so good".



RULE 7

R7: If the mother's answers are limited to:
→ third trimester (28-40 weeks)
→ Yes, I have swollen ankles.
Then, the answer is "Suggest elevating the legs and avoiding prolonged standing or sitting.".



RULE 7.1

R7.1: If the mother's answers are limited to:
→ third trimester (28-40 weeks)
→ No, I have no swollen ankles.
Then, the answer is "That is so good".



RULE 8

R8: If the mother's answers are limited to:

→ second trimester (13-27 weeks) or third trimester (28-40 weeks)

→ Yes, I have trouble sleeping. Then, the answer is "Recommend establishing a bedtime routine, maintaining a comfortable sleep environment, and practicing relaxation techniques such as deep breathing or prenatal meditation".

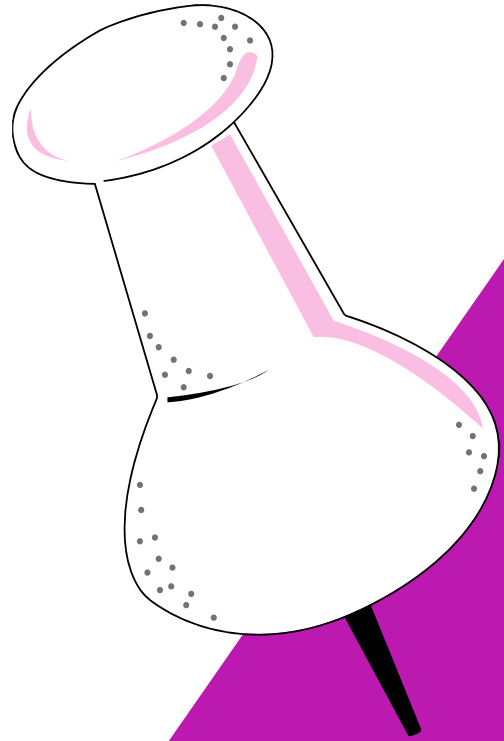


RULE 8.1

R8.1: If the mother's answers are limited to:

→ second trimester (13-27 weeks) or third trimester (28-40 weeks)

→ No, I have no trouble sleeping. Then, the answer is "That is so good".



RULE 9

R9: If the mother's answers are limited to:

→ third trimester (28-40 weeks)
→ Yes, I have experiencing back pain.

Then, the answer is "Recommend prenatal yoga, gentle stretching, and using a pregnancy support belt".

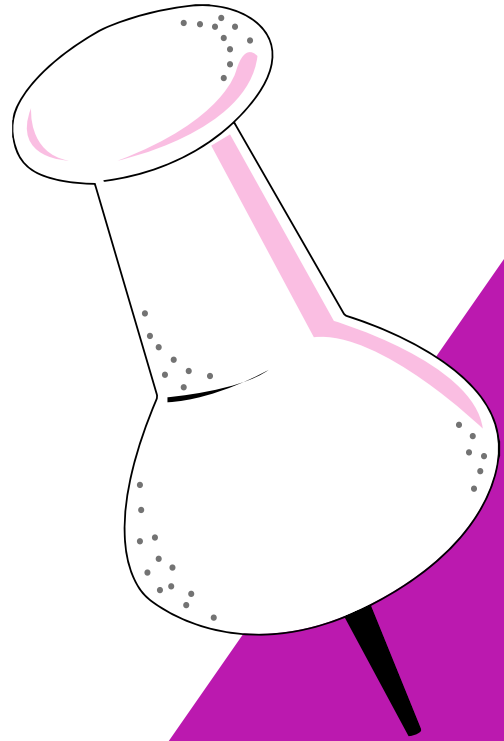


RULE 9.1

R9.1: If the mother's answers are limited to:

→ third trimester (28-40 weeks)
→ No, I have not experienced back pain.

Then, the answer is "That is so good".



RULE 10

R10: If the mother's answers are limited to:

- third trimester (28-40 weeks)
- Yes, I have swelling in the hands and face along with high blood pressure.

Then, the answer is "consult a healthcare professional immediately as it may indicate preeclampsia".

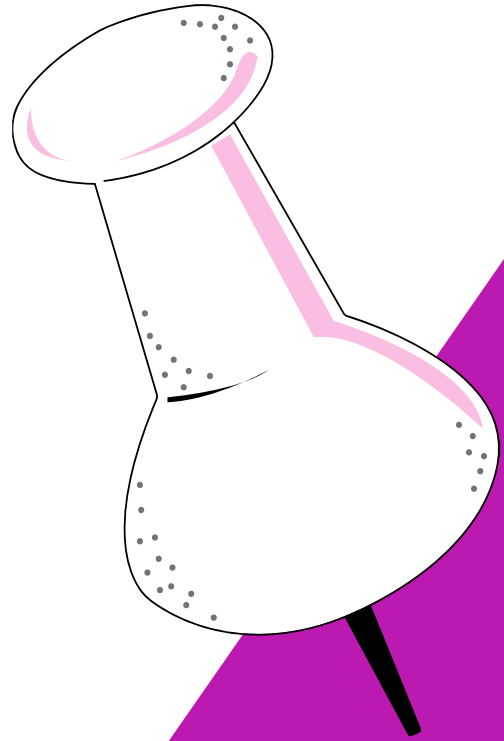


RULE 10.1

R10.1: If the mother's answers are limited to:

- third trimester (28-40 weeks).
- No, I have no swelling in the hands and face along with high blood pressure.

Then, the answer is "That is so good".



RULE 11

R11: If the mother's answers are limited to:

- third trimester (28-40 weeks)
- Yes, I have experiencing shortness of breath.

Then, the answer is "Advise her to maintain good posture, practice deep breathing exercises, and avoid overexertion".

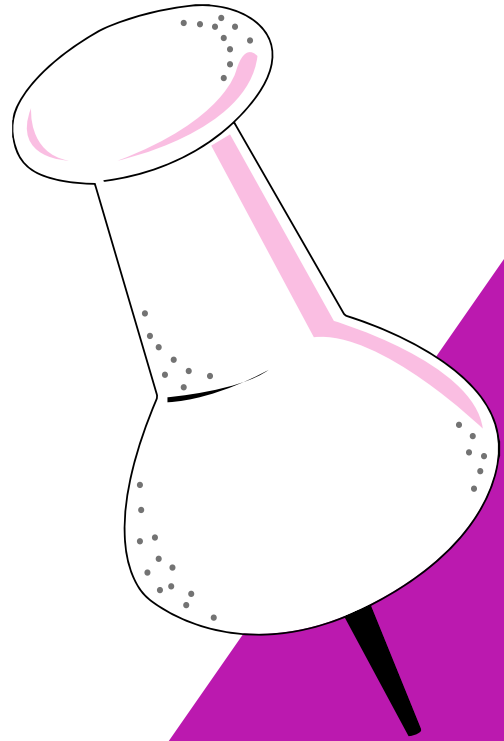


RULE 11.1

R11.1: If the mother's answers are limited to:

- third trimester (28-40 weeks)
- No, I have not experienced shortness of breath.

Then, the answer is "That is so good".



RULE 12

R12: If the mother's answers are limited to:

→ first trimester (0-12 weeks) or
second trimester (13-27 weeks) or
third trimester (28-40 weeks)

→ Yes, I have a Rh-negative
blood type.

Then, the answer is "Recommend
receiving Rh immunoglobulin
(RhIg) to prevent potential issues
with Rh incompatibility".



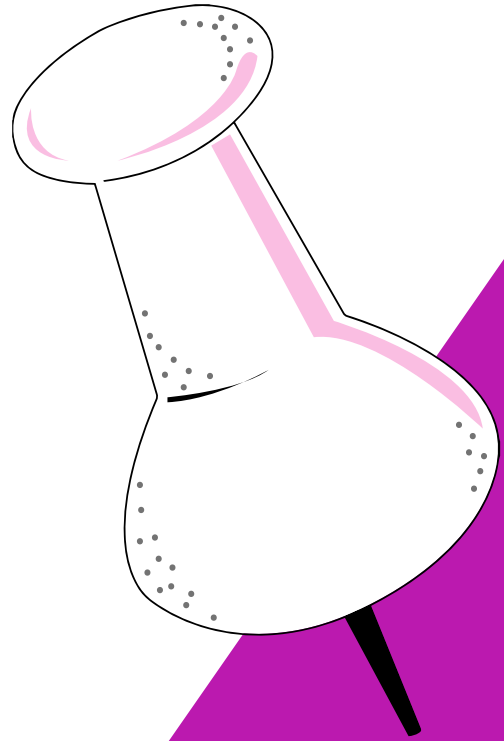
RULE 12.1

R12.1: If the mother's answers are limited to:

→ first trimester (0-12 weeks) or
second trimester (13-27 weeks) or
third trimester (28-40 weeks)

→ No, I have not a Rh-negative
blood type.

Then, the answer is "That is so
good".



RULE 13

R13: If the mother's answers are limited to:

- first trimester (0-12 weeks)
- Yes, I have a history of recurrent miscarriages.

Then, the answer is "Prescribe progesterone supplements to support the pregnancy".

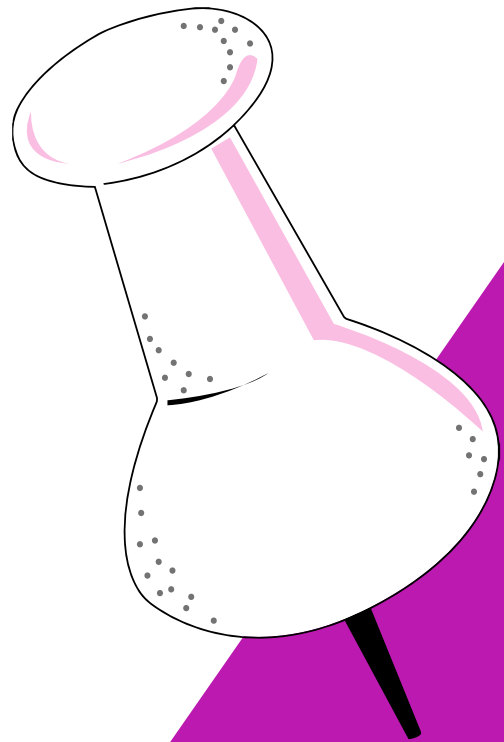


RULE 13.1

R13.1: If the mother's answers are limited to:

- first trimester (0-12 weeks)
- No, I have not a history of recurrent miscarriages.

Then, the answer is "That is so good".



RULE 14

R14: If the mother's answers are limited to:

- third trimester (28-40 weeks)
- Yes, I have reduced fetal movement.

Then, the answer is "Advise her to seek immediate medical attention for further evaluation".



RULE 14.1

R14.1: If the mother's answers are limited to:

- third trimester (28-40 weeks)
- No, I have not reduced fetal movement.

Then, the answer is "That is so good".



RULE 15

R15: If the mother's answers are limited to:

→ second trimester (13-27 weeks) or third trimester (28-40 weeks)

→ Yes, I have experiencing leg cramps.

Then, the answer is "Recommend gentle stretching exercises and increasing intake of calcium and magnesium-rich foods or supplements".



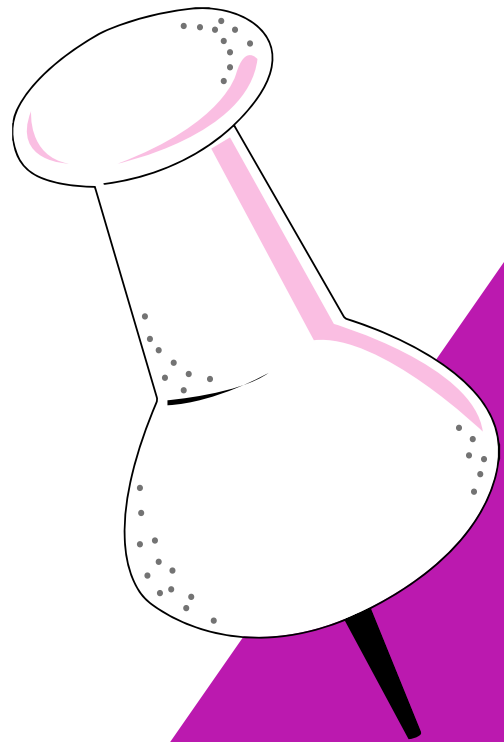
RULE 15.1

R15.1: If the mother's answers are limited to:

→ second trimester (13-27 weeks) or third trimester (28-40 weeks)

→ No, I have not experienced leg cramps.

Then, the answer is "That is so good".



RULE 16

R16: If the mother's answers are limited to:

→ third trimester (28-40 weeks)

→ Yes, I have Regular contractions, lasting less than two minutes between one contraction and the next, Extreme pressure and stress on the mother, and the descent of the fetal waters.

Then, the answer is " It may be childbirth, and you should go to the doctor immediately ".



RULE 16.1

R16.1: If the mother's answers are limited to:

→ third trimester (28-40 weeks)

→ No, I have no Regular contractions, lasting less than two minutes between one contraction and the next, Extreme pressure and stress on the mother, and the descent of the fetal waters.

Then, the answer is "That is so good".



RULE 17

R17: If the mother's answers are limited to:

→ first trimester (0-12 weeks) or second trimester (13-27 weeks) or third trimester (28-40 weeks)

→ Yes, I want.

Then, the answer is "Some tips that you should follow:

- Avoid X-rays.
- Avoid approaching cats.
- Avoid getting close to the paint.
- Get the necessary vitamins by consulting your doctor.
- Stay away from raw fish like sushi.
- Avoid fish that are high in iodine.
- Stay away from unpasteurized cheese.
- Stay away from cold cuts like sausage and mortadella.
- Avoid drinking too much coffee".



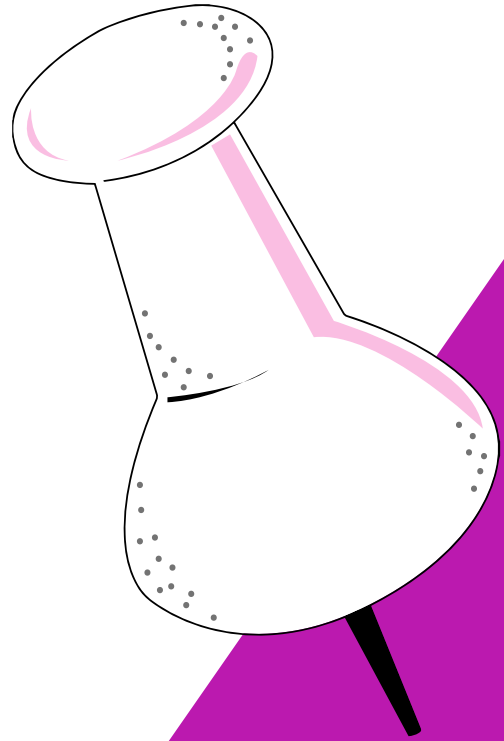
RULE 17.1

R17.1: If the mother's answers are limited to:

→ first trimester (0-12 weeks) or second trimester (13-27 weeks) or third trimester (28-40 weeks)

→ No, I do not want.

Then, the answer is " We wish you a healthy and comfortable pregnancy. Thanks for using our system :)".



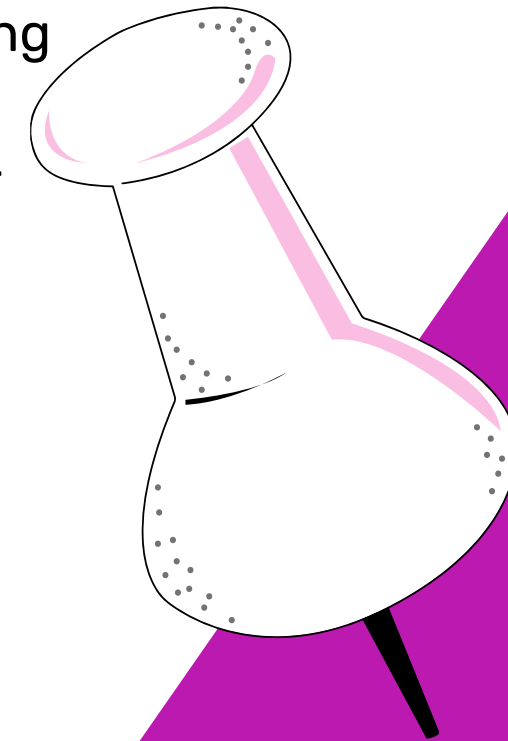
RULE 18

R18: If the mother's answers are limited to:

→ first trimester (0-12 weeks) or second trimester (13-27 weeks) or third trimester (28-40 weeks)

→ Yes, I have Breathing difficulty, Swelling of the face, legs, and hands, Blurred eyes and blurred vision, Fainting spells, Continuous diarrhea, and vomiting, or High body temperature or Spasms of the limbs and chest.

Then, the answer is " You should go to the doctor immediately ".



RULE 18.1

R18.1: If the mother's answers are limited to:

→ first trimester (0-12 weeks) or second trimester (13-27 weeks) or third trimester (28-40 weeks)

→ No, I do not have Breathing difficulty, Swelling of the face, legs, and hands, Blurred eyes and blurred vision, Fainting spells, Continuous diarrhea, and vomiting, or High body temperature or Spasms of the limbs and chest.

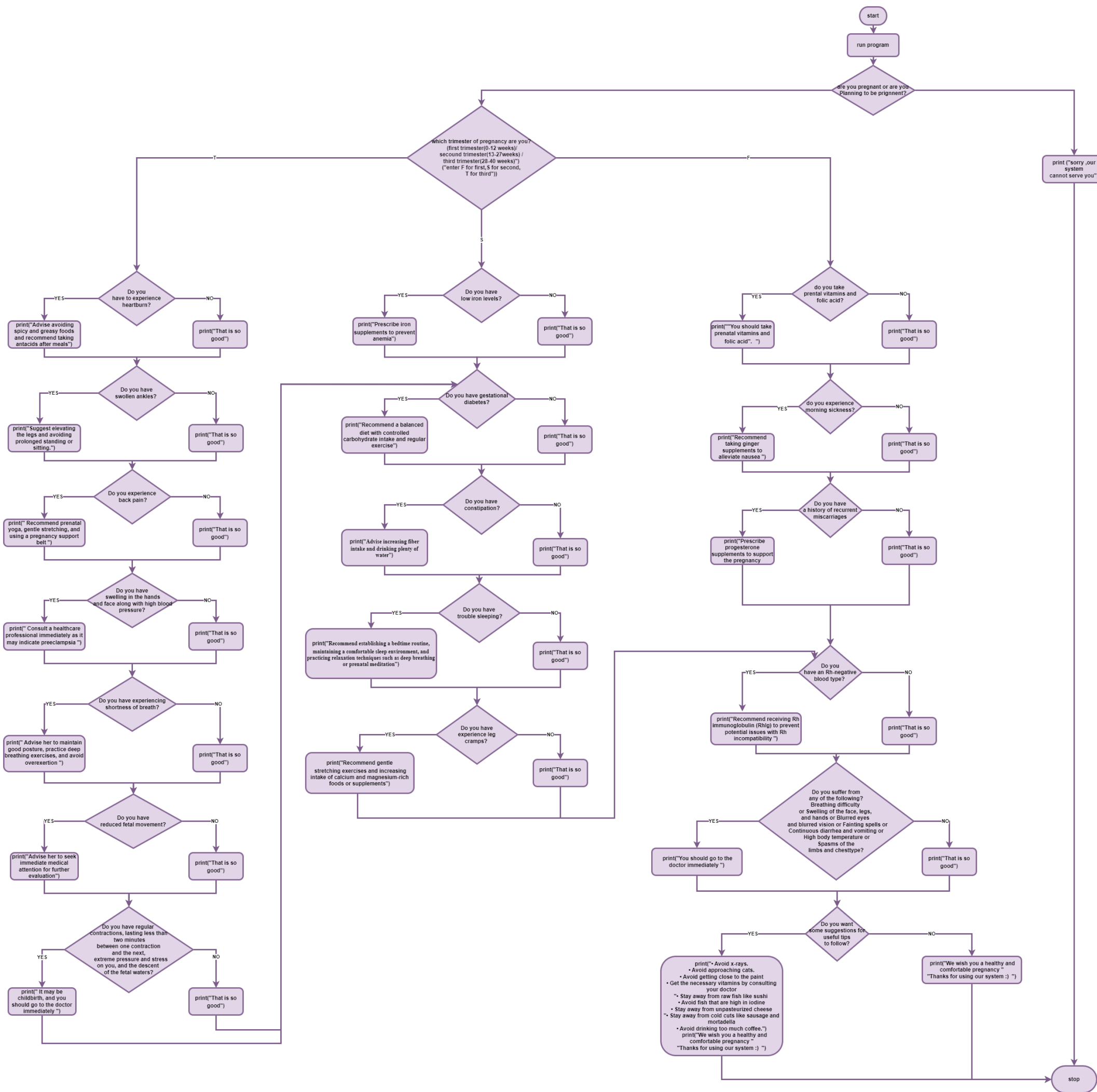
Then, the answer is " You should go to the doctor immediately ".

03

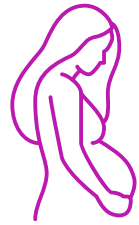


Mother Follower
Expert System

Flowchart



04



Mother Follower
Expert System

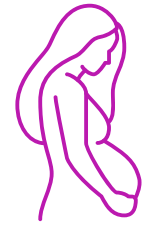
Implemented methods



Implemented methods

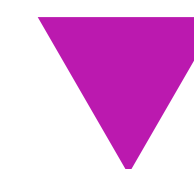
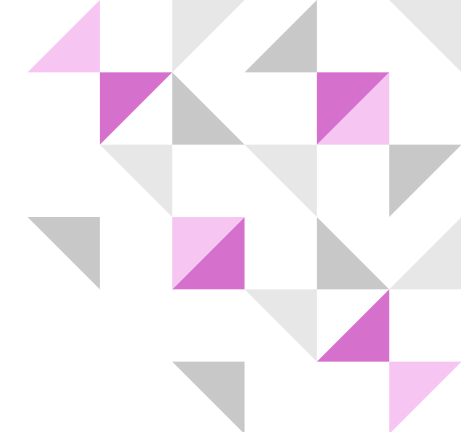
The technique we used is backward chaining, first, we conclude all possible results and write the rules based on those results, using Experta.

05



Mother Follower
Expert System

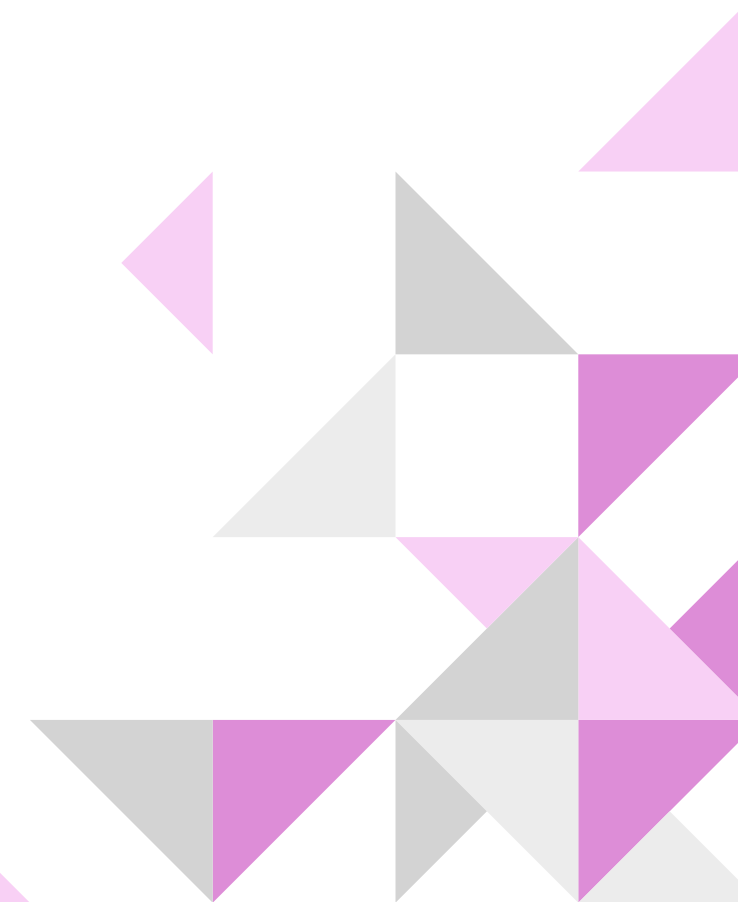
Result



Are you pregnant or are you planning to be pregnant? (yes/no) no

Sorry, our system cannot serve you):

Output 1




```
Are you pregnant or are you planning to be pregnant? (yes/no)  yes
In which trimester of pregnancy are you? (first trimester(0-12 weeks)/second trimester(13-27 weeks)/third trimester(28-40 weeks))
    (->Enter F for first ,S for second ,T for third)  f
Do you take prenatal vitamins and folic acid? (yes/no) no

You should take prenatal vitamins and folic acid

Do you experience morning sickness? (yes/no) yes

Recommend taking ginger supplements to alleviate nausea

Do you have a history of recurrent miscarriages? (yes/no) no

That is so good

Do you have an Rh-negative blood type? (yes/no) yes

Recommend receiving Rh immunoglobulin (RhIg) to prevent potential issues with Rh incompatibility

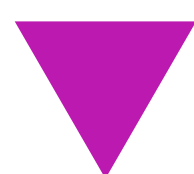
Do you suffer from any of the following? Breathing difficulty or Swelling of the face, legs, and hands or Blurred eyes
and blurred vision or Fainting spells or Continuous diarrhea and vomiting or High body temperature or Spasms of the limbs and chest? (yes/no) yes

You should go to the doctor immediately

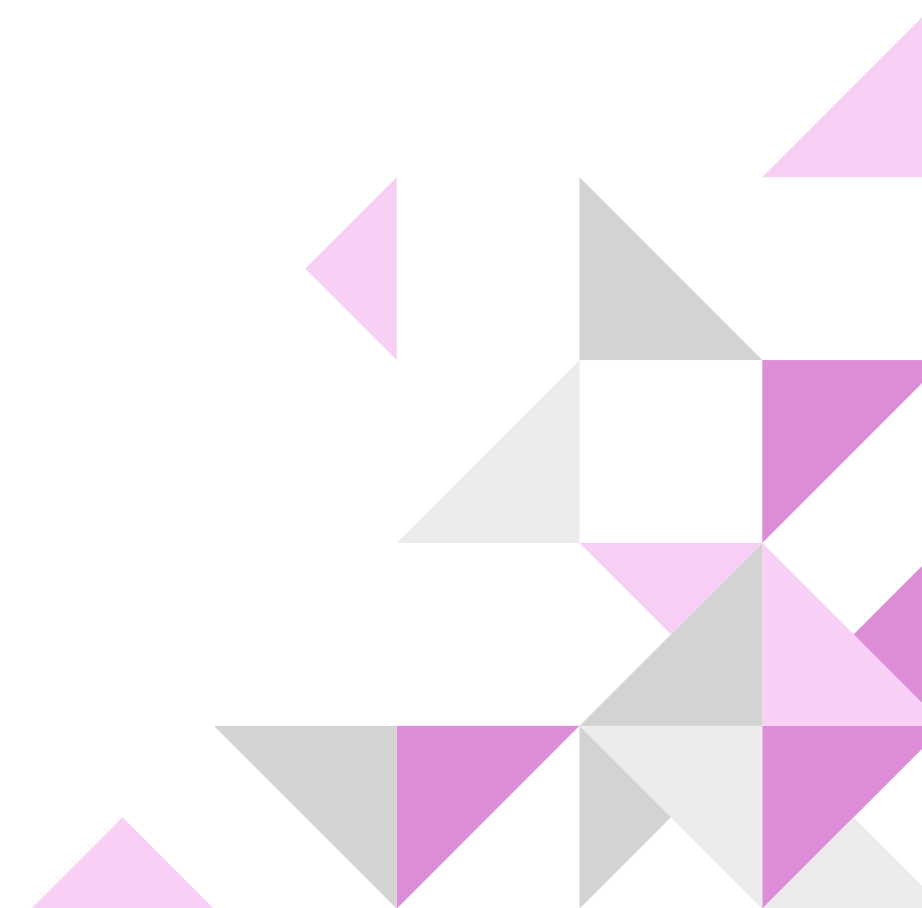
Do you want some suggestions for useful tips to follow? (yes/no) yes

• Avoid x-rays.
• Avoid approaching cats.
• Avoid getting close to the paint
• Get the necessary vitamins by consulting your doctor
• Stay away from raw fish like sushi
• Avoid fish that are high in iodine
• Stay away from unpasteurized cheese
• Stay away from cold cuts like sausage and mortadella
• Avoid drinking too much coffee.

We wish you a healthy and comfortable pregnancy
Thanks for using our system :)
```



Output 2



Are you pregnant or are you planning to be pregnant? (yes/no) yes
In which trimester of pregnancy are you? (first trimester(0-12 weeks)/second trimester(13-27 weeks)/third trimester(28-40 weeks))
(->Enter F for first ,S for second ,T for third) s
Do you have low iron levels? (yes/no) yes

Prescribe iron supplements to prevent anemia.

Do you have gestational diabetes? (yes/no) yes

Recommend a balanced diet with controlled carbohydrate intake and regular exercise

Do you have constipation? (yes/no) yes

Advise increasing fiber intake and drinking plenty of water

Do you have trouble sleeping? (yes/no) no

That is so good

Do you have experience leg cramps? (yes/no) yes

Recommend gentle stretching exercises and increasing intake of calcium and magnesium-rich foods or supplements

Do you have an Rh-negative blood type? (yes/no) no

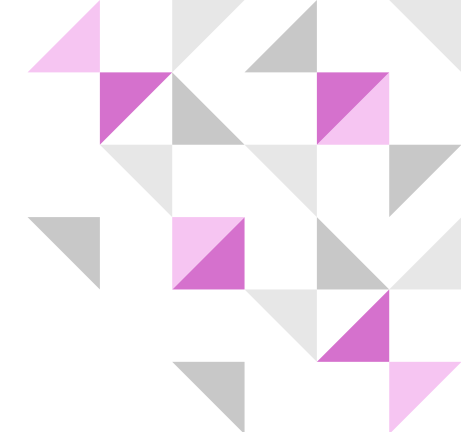
That is so good

Do you suffer from any of the following? Breathing difficulty or Swelling of the face, legs, and hands or Blurred eyes
and blurred vision or Fainting spells or Continuous diarrhea and vomiting or High body temperature or Spasms of the limbs and chest? (yes/no) no


That is so good

Do you want some suggestions for useful tips to follow? (yes/no) no

We wish you a healthy and comfortable pregnancy
Thanks for using our system :)



Output 3



```
Are you pregnant or are you planning to be pregnant? (yes/no)  yes
In which trimester of pregnancy are you? (first trimester(0-12 weeks)/second trimester(13-27 weeks)/third trimester(28-40 weeks))
    (->Enter F for first ,S for second ,T for third)    t
Do you have to experience heartburn? (yes/no) yes
```

Advise avoiding spicy and greasy foods and recommend taking antacids after meals

```
Do you have swollen ankles? (yes/no) yes
```

Suggest elevating the legs and avoiding prolonged standing or sitting.

```
Do you experience back pain? (yes/no) yes
```

Recommend prenatal yoga, gentle stretching, and using a pregnancy support belt

```
Do you have swelling in the hands and face along with high blood pressure? (yes/no) yes
```

Consult a healthcare professional immediately as it may indicate preeclampsia

```
Do you have experiencing shortness of breath? (yes/no) no
```

That is so good

```
Do you have reduced fetal movement? (yes/no) yes
```

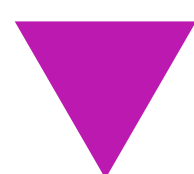
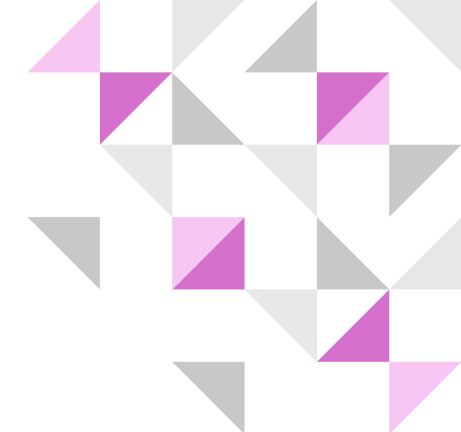
Advise her to seek immediate medical attention for further evaluation

```
Do you have regular contractions, lasting less than two minutes between one contraction and the next,
extreme pressure and stress on you, and the descent of the fetal waters?yes
```

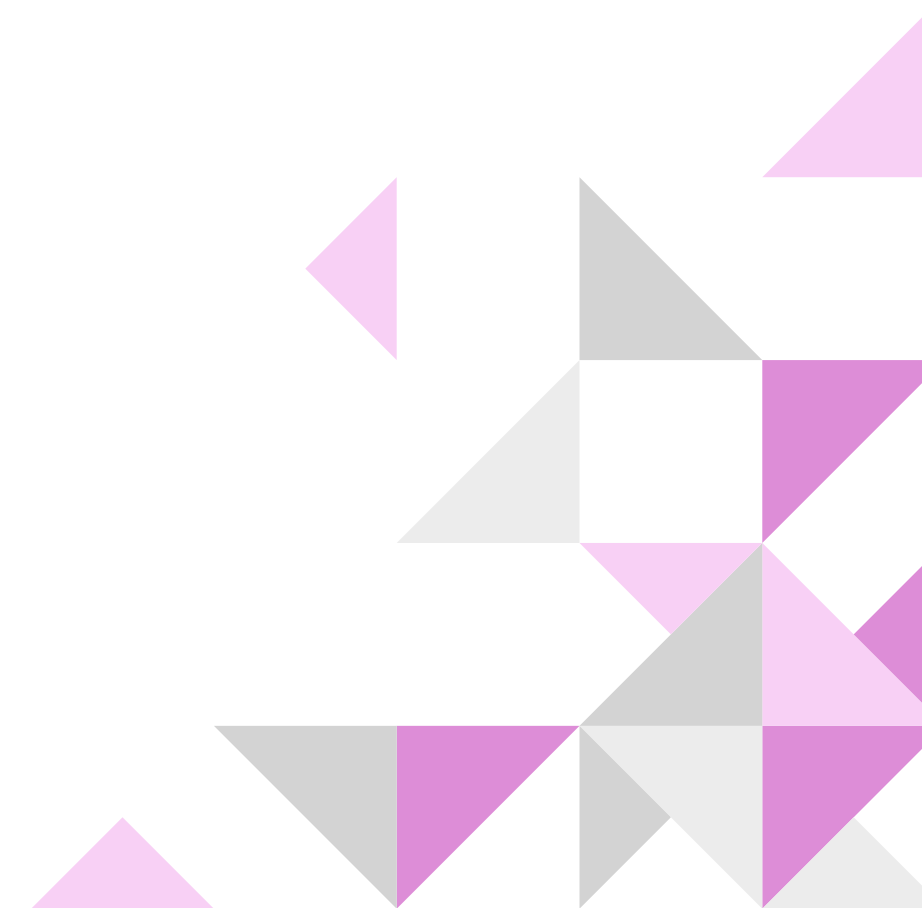
It may be childbirth, and you should go to the doctor immediately

```
Do you have gestational diabetes? (yes/no) no
```

That is so good



Output 4



Do you have constipation? (yes/no) yes

Advise increasing fiber intake and drinking plenty of water

Do you have trouble sleeping? (yes/no) yes

Recommend establishing a bedtime routine, maintaining a comfortable sleep environment, and practicing relaxation techniques such as deep breathing or prenatal meditation

Do you have experience leg cramps? (yes/no) no

That is so good

Do you have an Rh-negative blood type? (yes/no) yes

Recommend receiving Rh immunoglobulin (RhIg) to prevent potential issues with Rh incompatibility

Do you suffer from any of the following? Breathing difficulty or Swelling of the face, legs, and hands or Blurred eyes and blurred vision or Fainting spells or Continuous diarrhea and vomiting or High body temperature or Spasms of the limbs and chest? (yes/no) yes

You should go to the doctor immediately

Do you want some suggestions for useful tips to follow? (yes/no) no

We wish you a healthy and comfortable pregnancy
Thanks for using our system :)



Output 4





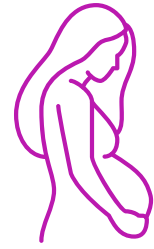
Our team

Noor Ahmed

Nsreen Hujatuallah

Hanoof Mohammed

Sara Alyami



**Mother Follower
Expert System**

Thank You
For Listening