



King Abdulaziz University, Jeddah, Saudi Arabia.
Faculty of Computing and Information Technology
Department of Computer Science
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Group Project



Nutrisentials



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1. Task Assignment

1.1. Tasks Performed for this Project

- Research regarding the vitamins chosen
- Creating and setting the system rules
- The purpose of the expert system
- The users of the system
- The experts
- Resources
- List of rules
- The technique used to acquire knowledge from the system
- Flowchart diagram
- Source code

1.2. Team Members Contribution

Team Member	Tasks	Contribution
Logain Sendi	<ul style="list-style-type: none">• Research regarding the vitamins chosen• Creating and setting the system rules• The purpose of the expert system• The users of the system• The experts• Resources• List of rules• The technique used to acquire knowledge from the system• Flowchart diagram• Source code	100% on all tasks
		
		

2. Introduction

2.1. The Purpose of the Chosen Expert System

Your body needs vitamins and minerals to grow and operate properly. While most individuals obtain all the essential nutrients by eating healthfully, certain people require a little nutrient supplement. Supplements can help by giving your body the assistance it needs to be healthy.

Some people may find it difficult to determine the nutritional supplement that their bodies lose, and taking supplements recklessly might also be harmful to their health. Here's where Nutrosentials expert systems will work. Nutrosentials expert system is made to assist users to figure out which supplements they should take. The system will select the most appropriate supplements for the user based on their responses after asking them a few simple questions that are easy to answer.

2.2. The Users of the System

Users of the system are people who wish to take body supplements to treat certain symptoms; they respond to the system's questions so that it may make the appropriate decisions.

2.3. The Expert(s) of the System

Selecting the appropriate supplements to take according to the user's answers.

2.4. The Resources

The information needed to build the system is collected from websites and applications that provide advice about health and symptoms of nutritional supplement deficiency. (Kassel, 2023) (Schneider, 2023)

3. Body

3.1. List of Rules

R1→ If the user answers all the following questions as:

- Yes, I follow a vegan or strict vegetarian diet.
- Yes, I'm anemic.

Then the answer is "Vitamin B12".

R2→ If the user answers all the following questions as:

- Female.
- Yes, interested in prenatal or postnatal health.

Then the answer is "Folic Acid".

R3→ If the user's answers are limited to:

- Yes, I have a history of osteoporosis.

Then the answer is "Calcium".

R4→ If the user's answers are limited to:

- Yes, I'm often around people who might have immune sensitivities.

Then the answer is "Vitamin C".

R5→ If the user answers all the following questions as:

- No, I'm not allergic to fish or fish oil.
- Yes, I have a family history of heart problems.

Then the answer is "Fish Oil".

R6→ If the user's answers are limited to:

- Yes, I have trouble falling/staying asleep.

Then the answer is "Melatonin".

R7→ If the user answers all the following questions as:

- Yes, I feel drained at the end of day.
- Yes, my muscles twitch sometimes.

Then the answer is “Magnesium”.

R8→ If the user answers all the following questions as:

- Yes, I’m looking for vitamin that help with nail/hair care.
- Yes, I lose my appetite overtime.

Then the answer is “Zinc”.

R8→ If the user’s answers are limited to:

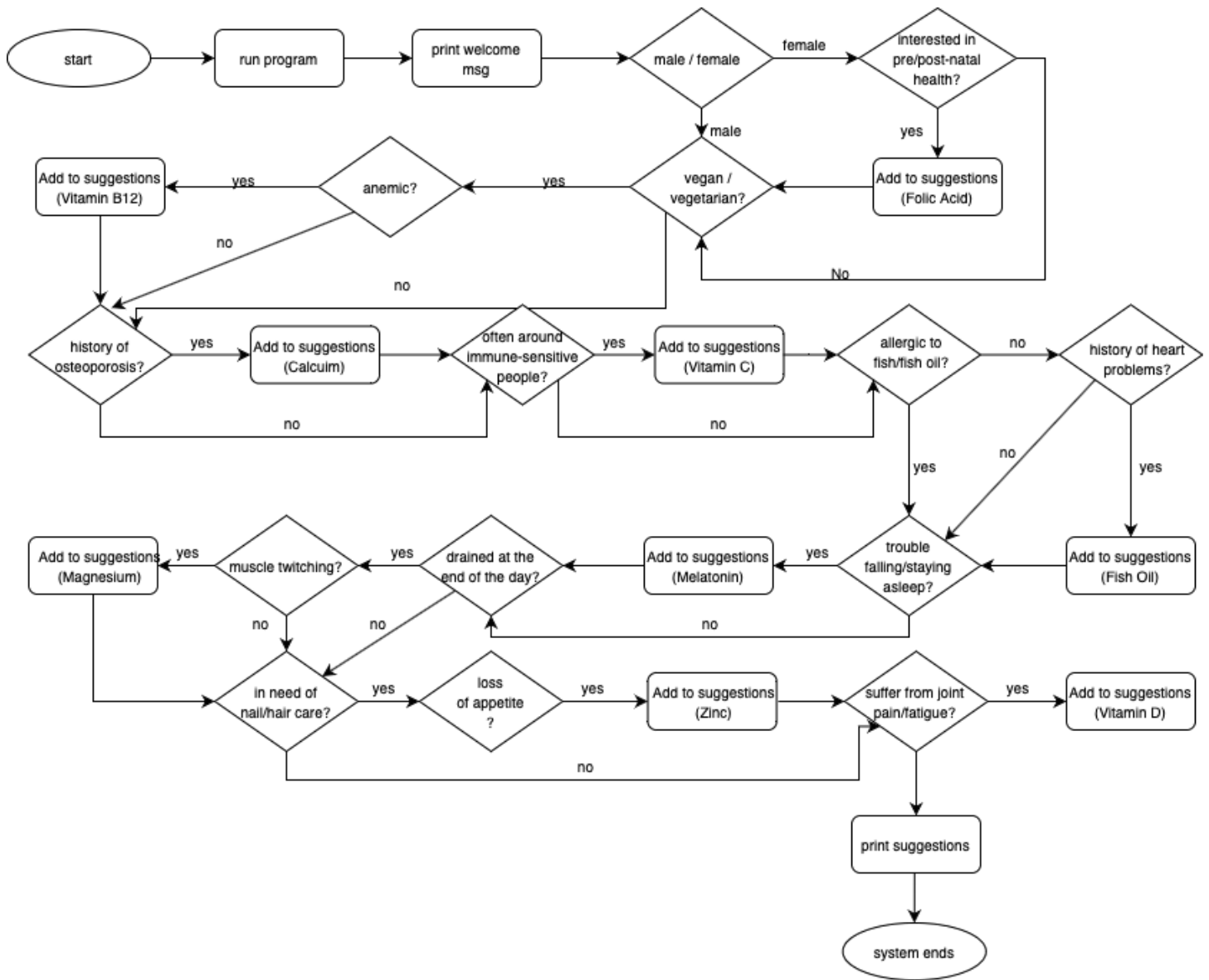
- Yes, I have joint pain, lethargy, or fatigue.

Then the answer is “Vitamin D”.

3.2. The techniques used to Acquire Knowledge from the System

For this expert system, we used the technique of forward chaining. First, we researched and collected all the rules for the potential outputs and then applied them using Experta.

3.3. The system's Flowchart



4. References

Kassel, G. (2023, March 20). *According to Nutritionists, These Are the 7 Ingredients Your Multivitamin Should Have*. Healthline.

<https://www.healthline.com/health/food-nutrition/best-vitamins-to-take-daily>

Schneider, K. (2023, May 19). 9 Vitamins and Minerals You Should Take Daily. *Cleveland Clinic*.

<https://health.clevelandclinic.org/which-vitamins-should-you-take/>

The Truth About Supplements: 5 Things You Should Know. Pennmedicine.org.
(2022, January 31).

<https://www.pennmedicine.org/updates/blogs/health-and-wellness/2020/february/the-truth-about-supplements>

5. Appendices

5.1. Source Code

```
6. from experta import *
7.
8. class Nutrisentials(Fact):
9.     pass
10.
11. class supplements(KnowledgeEngine):
12.     # 1 Vitamin B12
13.     @Rule(Nutrisentials(vitaminB12 = 'y'))
14.     def vitaminB12_supp(self):
15.         print("Vitamin B12")
16.
17.     # 2 Folic acid
18.     @Rule(Nutrisentials(folicAcid = 'y'))
19.     def folicAcid_supp(self):
20.         print("Folic acid ")
21.
22.     # 3 Calcium
23.     @Rule(Nutrisentials(calcium = 'y'))
24.     def calcium_supp(self):
25.         print("Calcium")
26.
27.     # 4 Vitamin C
28.     @Rule(Nutrisentials(vitaminC = 'y'))
29.     def vitaminC_supp(self):
30.         print("Vitamin C")
31.
32.     # 5 Fish Oil
33.     @Rule(Nutrisentials(fishOil = 'y'))
34.     def fishOil_supp(self):
35.         print("Fish Oil")
36.
37.     # 6 Melatonin
38.     @Rule(Nutrisentials(melatonin = 'y'))
39.     def melatonin_supp(self):
40.         print("Melatonin")
41.
42.     # 7 Magnesium
43.     @Rule(Nutrisentials(magensium = 'y'))
44.     def magensium_supp(self):
45.         print("Magnesium")
46.
47.     # 8 Zinc
```

```

48.     @Rule(Nutrisentials(zinc = 'y'))
49.     def zinc_supp(self):
50.         print("Zinc")
51.
52.     # 9 Vitamin D
53.     @Rule(Nutrisentials(vitaminD = 'y'))
54.     def vitaminD_supp(self):
55.         print("Vitamin D")
56.
57.     # Non-rule
58.     @Rule(AND(Nutrisentials(vitaminB12='n'), Nutrisentials(folicAcid='n'),
59.               Nutrisentials(calcium = 'n'),
60.               Nutrisentials(vitaminC = 'n'), Nutrisentials(fishOil = 'n'),
61.               Nutrisentials(melatonin = 'n'), Nutrisentials(magnesium = 'n'),
62.               Nutrisentials(magnesium = 'n'),
63.               Nutrisentials(zinc = 'n'), Nutrisentials(vitaminD = 'n')))
64.     def non_supp(self):
65.         print("You are healthy enough, no supplements needed.")
66.
67. engine = supplements()
68. engine.reset()
69.
70. print("-----")
71. print("|              Nutrisentials for health
72.     supplements              |")
73. print("-----")
74.
75. gender = input("Are you Female/Male? (f/m) ")
76.
77. # Folic Acid
78. if gender=="f":
79.     nutrisentials_folicAcid = input("Are you interested in prenatal or
80.     postnatal health? (y/n) ").lower()
81. else:
82.     nutrisentials_folicAcid = 'n'
83.
84. # Vitamin B12
85. nutrisentials_vitaminB12 = 'n'
86.
87. vitaminB12_q1 = input("Do you follow any Vegan or Vegetarian diet? (y/n)
88.     ").lower()
89. if vitaminB12_q1 == 'y':
90.     vitaminB12_q2 = input("Do you suffer from Anemia? (y/n) ").lower()
91.     if vitaminB12_q2 == 'y':
92.         nutrisentials_vitaminB12 = 'y'

```

```
87.
88.# Calcium
89.nutrisentials_calcium = input("Do your parents (or siblings) have a
    history of osteoporosis? (y/n) ").lower()
90.
91.# Vitamin C
92.nutrisentials_vitaminC = input("Are you often around people who might have
    immune sensitivities? (y/n) ").lower()
93.
94.# Fish Oil
95.allergy = input("Are you allergic to fish or fish oil? (y/n) ")
96.
97.if allergy=='n':
98.    nutrisentials_fishOil = input("Do you have a family history of heart
    problems? (y/n) ").lower()
99.else:
100.    nutrisentials_fishOil = 'n'
101.
102.    # Melatonin
103.    nutrisentials_melatonin = input("Do you sometimes have trouble
    falling/staying asleep? (y/n) ").lower()
104.
105.    # Magnesium
106.    nutrisentials_magnesium = 'n'
107.
108.    magnesium_q1 = input("Do you feel drained at the end of day? (y/n)
    ").lower()
109.    if magnesium_q1 == 'y':
110.        magnesium_q2 = input("Does your muscles twitches sometimes?
    (y/n) ").lower()
111.        if magnesium_q2 == 'y':
112.            nutrisentials_magnesium = 'y'
113.
114.    # Zinc
115.    nutrisentials_zinc = 'n'
116.
117.    zinc_q1 = input("Are you looking for vitamin that help with
    nail/hair care? (y/n) ").lower()
118.    if zinc_q1 == 'y':
119.        zinc_q2 = input("Do you feel like you loss appetite
    overtime? (y/n) ").lower()
120.        if zinc_q2 == 'y':
121.            nutrisentials_zinc = 'y'
122.
123.    # Vitamin D
```

```
124.     nutrisentials_vitaminD = input("Do you have joint pain, lethargy, or
      fatigue? (y/n) ").lower()
125.
126.     print("\nBased on your answers, we suggest the following
      supplements: ")
127.
128.     engine.declare(Nutrisentials(
129.         vitaminB12 = nutrisentials_vitaminB12,
130.         folicAcid = nutrisentials_folicAcid,
131.         calcium = nutrisentials_calcium,
132.         vitaminC = nutrisentials_vitaminC ,
133.         fishOil = nutrisentials_fishOil,
134.         melatonin = nutrisentials_melatonin,
135.         magensium = nutrisentials_magnesium,
136.         zinc = nutrisentials_zinc,
137.         vitaminD = nutrisentials_vitaminD))
138.
139.     engine.run()
```

5.2. Screenshots

```
-----  
|               Nutrisentials for health supplements               |  
-----  
Are you Female/Male? (f/m) f  
Are you interested in prenatal or postnatal health? (y/n) y  
Do you follow any Vegan or Vegetarian diet? (y/n) y  
Do you suffer from Anemia? (y/n) y  
Do your parents (or siblings) have a history of osteoporosis? (y/n) y  
Are you often around people who might have immune sensitivities? (y/n) y  
Are you allergic to fish or fish oil? (y/n) y  
Do you sometimes have trouble falling/staying asleep? (y/n) y  
Do you feel drained at the end of day? (y/n) y  
Does your muscles twitches sometimes? (y/n) y  
Are you looking for vitamin that help with nail/hair care? (y/n) y  
Do you feel like you loss appetite overtime? (y/n) y  
Do you have joint pain, lethargy, or fatigue? (y/n) y  
  
Based on your answers, we suggest the following supplements:  
Vitamin D  
Melatonin  
Vitamin B12  
Zinc  
Magnesium  
Folic acid  
Calcium  
Vitamin C
```

```
-----  
|               Nutrisentials for health supplements               |  
-----  
Are you Female/Male? (f/m) f  
Are you interested in prenatal or postnatal health? (y/n) n  
Do you follow any Vegan or Vegetarian diet? (y/n) n  
Do your parents (or siblings) have a history of osteoporosis? (y/n) n  
Are you often around people who might have immune sensitivities? (y/n) n  
Are you allergic to fish or fish oil? (y/n) n  
Do you have a family history of heart problems? (y/n) n  
Do you sometimes have trouble falling/staying asleep? (y/n) n  
Do you feel drained at the end of day? (y/n) n  
Are you looking for vitamin that help with nail/hair care? (y/n) n  
Do you have joint pain, lethargy, or fatigue? (y/n) n  
  
Based on your answers, we suggest the following supplements:  
You are healthy enough, no supplements needed.
```

```

-----
|               Nutrisentials for health supplements               |
-----
Are you Female/Male? (f/m) m
Do you follow any Vegan or Vegetarian diet? (y/n) y
Do you suffer from Anemia? (y/n) y
Do your parents (or siblings) have a history of osteoporosis? (y/n) y
Are you often around people who might have immune sensitivities? (y/n) y
Are you allergic to fish or fish oil? (y/n) y
Do you sometimes have trouble falling/staying asleep? (y/n) y
Do you feel drained at the end of day? (y/n) y
Does your muscles twitches sometimes? (y/n) y
Are you looking for vitamin that help with nail/hair care? (y/n) y
Do you feel like you loss appetite overtime? (y/n) y
Do you have joint pain, lethargy, or fatigue? (y/n) y

Based on your answers, we suggest the following supplements:
Melatonin
Zinc
Magnesium
Vitamin B12
Vitamin C
Calcium
Vitamin D

```

```

-----
|               Nutrisentials for health supplements               |
-----
Are you Female/Male? (f/m) m
Do you follow any Vegan or Vegetarian diet? (y/n) n
Do your parents (or siblings) have a history of osteoporosis? (y/n) n
Are you often around people who might have immune sensitivities? (y/n) n
Are you allergic to fish or fish oil? (y/n) n
Do you have a family history of heart problems? (y/n) n
Do you sometimes have trouble falling/staying asleep? (y/n) n
Do you feel drained at the end of day? (y/n) n
Are you looking for vitamin that help with nail/hair care? (y/n) n
Do you have joint pain, lethargy, or fatigue? (y/n) n

Based on your answers, we suggest the following supplements:
You are healthy enough, no supplements needed.

```

| Nutrisentials for health supplements |

Are you Female/Male? (f/m) m

Do you follow any Vegan or Vegetarian diet? (y/n) y

Do you suffer from Anemia? (y/n) n

Do your parents (or siblings) have a history of osteoporosis? (y/n) n

Are you often around people who might have immune sensitivities? (y/n) n

Are you allergic to fish or fish oil? (y/n) n

Do you have a family history of heart problems? (y/n) y

Do you sometimes have trouble falling/staying asleep? (y/n) n

Do you feel drained at the end of day? (y/n) y

Does your muscles twitches sometimes? (y/n) n

Are you looking for vitamin that help with nail/hair care? (y/n) y

Do you feel like you loss appetite overtime? (y/n) n

Do you have joint pain, lethargy, or fatigue? (y/n) n

Based on your answers, we suggest the following supplements:

Fish Oil

DE C:\Users\AGUE\