

“ICE CREAM FLAVOR RECOMMENDATION SYSTEM”

Mini Project-1

CCAI-221-

Fundamentals of AI

**BUILD YOUR
ICE CREAM
SOCIAL**



IDEA DESCRIPTION:



Because it is a multi-flavored ice cream, as its flavors reach a huge number of flavors. We have created a system that advises users of this system on different types of ice cream flavors, but this recommendation is not made randomly. On the contrary, it is done in a sequential and organized manner, and this is what distinguishes our system. As the system recommends flavors of ice cream that suit the taste of each user, and this is what makes the process of choosing and experimenting with flavors a correct experience and a successful choice. This recommendation is not random, but is based on the inputs that the user has to enter in order to get suitable proposals that suit him in various aspects.

THE DESCRIPTION

THE PROBLEM:

Ice cream is one of the most popular foods for adults and children alike. But many people of all ages may face the problem of confusion due to the countless flavors, categories and colors of ice cream. This may lead them to fall into wrong and unsuccessful experiences because of their choice of flavors or categories that do not suit their preferences or flavors that may suit their preferences, but the colors Or categories of ice cream that do not suit their mood or health condition, and this in return is a waste of money, and they may not repeat this experience again because of their wrong choice of flavor, color, or category of ice cream, in addition to that the wrong choice of flavors, category, or color can affect Negatively affect your mood or health.

THE DESCRIPTION

THE SOLUTION:

And because the choice of flavors is very important because it may negatively affect mood or health, and accordingly, our system relies on solving these problems, as each ice cream flavor is not suggested randomly, but rather will be dependent on several things such as personality style, mood and class that Ice cream and the color of ice cream belong to it, and through the inputs entered by users, and depending on this, our system will suggest ice cream flavors to users in proportion to these inputs.



**Thinking
Humanly**

**Thinking
Rationally**

**Acting
Humanly**

**Acting
Rationally**

AI APPROACH USED

1-THINKING RATIONALLY:

The “Laws of thought” approach: based on the knowledge we have and inference mechanisms that are provably correct and guarantee an optimal solution.

2-ACTING RATIONALLY:

“The rational agent” approach: our system is focusing on acting in sufficiently, if not optimally in all situations to achieve the best outcome or, when there is uncertainty, the best expected outcome.

An example of this is the mood: suppose the user enters the input and his personality mood is “charming, impulsive” Based on this system, he will recommend ice cream flavors knowing that it will suit his personality mood perfectly.

BRIEF NOTE:

Using the knowledge from:

<https://www.delish.com/food/news/a39872/baskin-robbins-ice- cream-flavors-personality/>



ICE CREAM FLAVOR:

- Chocolate
- Vanilla
- Strawberry
- almond fudge
- Rocky Road



WE KNOW THAT THERE ARE 5 TYPES OF GENERAL PERSONALITIES:

- charming
- impulsive
- aggressive
- loving
- introvert



ICE CREAM TYPE:

- Basic
- Fruity
- Custard

BRIEF NOTE:

Using the knowledge from :

<https://onlinelibrary.wiley.com/doi/full/10.1002/col.22171>



WE ARE CATEGORIZING AGE IN THESE THREE PERIODS:

- Child
- Teen
- Adult



WE ARE CATEGORIZING MOODS GENERALLY IN THESE TWO TYPES:

- Happy
- Sad



WE ARE CATEGORIZING COLORS EFFECT GENERALLY IN THESE TWO TYPES:

- Light colour
- Dark colour

FACTOR TABLE:

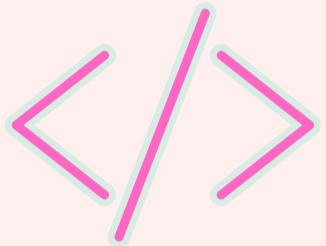
Personality	Age	Cup colors	Mood	Ice cream type	Ice cream Flavor
charming	Child light		Sad	Basic	Chocolate
Impulsive	Child light		Sad	Basic	Vanilla
Aggressive	Child light		Sad	Custard	Rocky road
Loving	Child light		Sad	Custard	Almond fudge
introvert	Child light		Sad	Fruity	Strawberry
personality	Teen light		Sad	Basic	Chocolate
charming	Teen light		Sad	Basic	Vanilla
Impulsive	Teen light		Sad	Custard	Rocky road
Aggressive	Teen light		Sad	Custard	Almond fudge
Loving	Teen light		Sad	Fruity	Strawberry
personality	Adult light		Sad	Basic	Chocolate
charming	Adult light		Sad	Basic	Vanilla
Impulsive	Adult light		Sad	Custard	Rocky road
Aggressive	Adult light		Sad	Custard	Almond fudge
Loving	Adult light		Sad	Fruity	Strawberry
charming	Child dark		happy	Basic	Chocolate
Impulsive	Child dark		happy	Basic	Vanilla
Aggressive	Child dark		happy	Custard	Rocky road
Loving	Child dark		happy	Custard	Almond fudge
introvert	Child dark		happy	Fruity	Strawberry
personality	Teen dark		happy	Basic	Chocolate
charming	Teen dark		happy	Basic	Vanilla
Impulsive	Teen dark		happy	Custard	Rocky road
Aggressive	Teen dark		happy	Custard	Almond fudge
Loving	Teen dark		happy	Fruity	Strawberry
personality	Adult dark		happy	Basic	Chocolate
charming	Adult dark		happy	Basic	Vanilla
Impulsive	Adult dark		happy	Custard	Rocky road
Aggressive	Adult dark		happy	Custard	Almond fudge
Loving	Adult dark		happy	Fruity	Strawberry



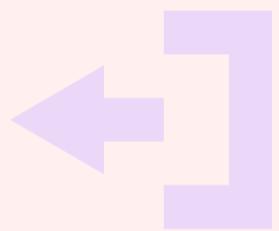
REFERENCES:

- Barbut, S. (2001). Effect of illumination source on the appearance of fresh meat cuts. *Meat Science*, 29(2), 181-191.
- Hong, J. J., Park, Y. K., & Seo, M. J. (2010). A study on the LED lighting and background color for a bakery, focusing on the bread color of YR order. *Journal of Korean Society of Color Studies*, 24(1), 105-113.
- Korea Industrial Standards. (1998). Recommendation levels of illumination (KS A 3011). Seoul: Korean Standards Association.
- Oberfeld, D., Hecht, H., Allendorf, U., & Wickelmaier, F. (2009). Ambient lighting modifies the flavor of wine. *Journal of Sensory Studies*, 24, 797-832.

TASK -2



**THE CODE
GENERATED FOR
THE SYSTEM**



**SCREEN SHOTS OF
THE OUTPUT OF
THE SYSTEM.**



Here is the full code:

HERE IS THE FULL CODE:

```
suggest(S):-write('What is your personality type?:  
(Charming,Impulsive,Aggressive,Loving,Introvert)'),  
          read(P),  
          write('what age Group do you classify?:  
(Child, Teen, Adult)'),read(A),  
          write('what kind of color do you prefer?:(Light,Dark)'),  
          read(C),  
          write('How is your mood?:(Happy,Sad)'),  
          read(M),  
          write('what ice cream type do you prefer?:  
(Basic,Custard,Fruity)'),read(T),  
          flavor(S,P,A,C,M,T).
```

HERE IS THE FULL CODE:

```
%Sad Mood
flavor('Chocolate',P,A,C,M,T):-
P=charming,A=child,C=light,M=sad,T= basic.
flavor('Vanilla',P,A,C,M,T):-
P=impulsive,A=child,C=light,M=sad,T= basic.
flavor('Rocky road',P,A,C,M,T):-
P=aggressive,A=child,C=light,M=sad,T= custard.
flavor('Almond fudge',P,A,C,M,T):-
P=loving,A=child,C=light,M=sad,T= custard.
flavor('Strawberry',P,A,C,M,T):-
P=introvert,A=child,C=light,M=sad,T= fruity.
flavor('Chocolate',P,A,C,M,T):-
P=charming,A=teen,C=light,M=sad,T= basic.
flavor('Vanilla',P,A,C,M,T):-P=impulsive,A=teen,C=light,
M=sad,T= basic.
flavor('Rocky road',P,A,C,M,T):-
P=aggressive,A=teen,C=light,M=sad,T= custard.
flavor('Almond fudge',P,A,C,M,T):-
P=loving,A=teen,C=light,M=sad,T= custard.
flavor('Strawberry',P,A,C,M,T):-
P=introvert,A=teen,C=light,M=sad,T= fruity.
flavor('Chocolate',P,A,C,M,T):-
P=charming,A=adult,C=light,M=sad,T= basic.
flavor('Vanilla',P,A,C,M,T):-
P=impulsive,A=adult,C=light,M=sad,T= basic.
flavor('Rocky road',P,A,C,M,T):-
P=aggressive,A=adult,C=light,M=sad,T= custard.
flavor('Almond fudge',P,A,C,M,T):-
P=loving,A=adult,C=light,M=sad,T= custard.
flavor('Strawberry',P,A,C,M,T):-
P=introvert,A=adult,C=light,M=sad,T= fruity.
```

HERE IS THE FULL CODE:

```
%Happy mood
flavor('Chocolate',P,A,C,M,T):-
P=charming,A=child,C=dark,M=happy,T= basic.
flavor('Vanilla',P,A,C,M,T):-
P=impulsive,A=child,C=dark,M=happy,T= basic.
flavor('Rocky road',P,A,C,M,T):-
P=aggressive,A=child,C=dark,M=happy,T= custard.
flavor('Almond fudge',P,A,C,M,T):-
P=loving,A=child,C=dark,M=happy,T= custard.
flavor('Strawberry',P,A,C,M,T):-
P=introvert,A=child,C=dark,M=happy,T= fruity.
flavor('Chocolate',P,A,C,M,T):-
P=charming,A=teen,C=dark,M=happy,T= basic.
flavor('Vanilla',P,A,C,M,T):-
P=impulsive,A=teen,C=dark,M=happy,T= basic.
flavor('Rocky road',P,A,C,M,T):-
P=aggressive,A=teen,C=dark,M=happy,T= custard.
flavor('Almond fudge',P,A,C,M,T):-
P=loving,A=teen,C=dark,M=happy,T= custard.
flavor('Strawberry',P,A,C,M,T):-
P=introvert,A=teen,C=dark,M=happy,T= fruity.
flavor('Chocolate',P,A,C,M,T):-
P=charming,A=adult,C=dark,M=happy,T= basic.
flavor('Vanilla',P,A,C,M,T):-
P=impulsive,A=adult,C=dark,M=happy,T= basic.
flavor('Rocky road',P,A,C,M,T):-
P=aggressive,A=adult,C=dark,M=happy,T= custard.
flavor('Almond fudge',P,A,C,M,T):-
P=loving,A=adult,C=dark,M=happy,T= custard.
flavor('Strawberry',P,A,C,M,T):-
P=introvert,A=adult,C=dark,M=happy,T= fruity.
```

Q1:suggest

Some questions and suggestions that appear in the list will be asked based on the answers entered

The screenshot shows the SWISH interface. On the left, there is a code editor window containing Prolog code for a 'suggest' predicate. The code defines various personality types (Charming, Impulsive, Aggressive, Loving, Introvert) and their corresponding preferences (age group, color, mood, flavor). On the right, there is a search interface with a table of suggestions and a query form. The table has columns for 'FLAVOR' and 'SUGGESTION'. The query form contains fields for personality type, age group, color, mood, and flavor, with dropdown menus for each.

```
1 suggest(S):-write('What is your personality type?:(Charming,Impulsive,Aggressive,Loving,Introvert)'),read(P),write('what age Group do you classify?:(Child, Teen, Adult)'),read(A),write('what kind of color do you prefer?:(Light,Dark)'),read(C),write('How is your mood?:(Happy,Sad)'),read(M),write('what ice cream type do you prefer?:(Basic,Custard,Fruity)'),read(T),flavor(S,P,A,C,M,T).
```

FLAVOR	SUGGESTION
'Chocolate'	charming
'Vanilla'	impulsive
false	

QUERY EXAMPLES:

Q2:Compound Queries with 3 variables

Find flavour type , personality type, Ice cream type by Age group

Note: No matter the mood or color type

-input

- Age group 1->child
- Agr group 2->teen

Output:

- flavour Type
- Personality Type
- Ice cream Type

The screenshot shows the SWISH interface with a code editor and a results table. The code defines compound queries for 'flavor' based on 'FLAVOUR_TYPE', 'PERSON_TYPE', and 'ICE_CREAM_TYPE'. The results table lists 20 rows of data, each with columns for 'FLAVOUR_TYPE', 'PERSON_TYPE', and 'ICE_CREAM_TYPE'. The table also includes a header row and a footer row with additional query definitions.

```
1 flavor(Flavour_Type,Person_Type,Child,_,-,Ice_Cream_Type), flavor(Flavour_Type,Person_Type,Teen,_,-,Ice_Cream_Type).
```

FLAVOUR_TYPE	PERSON_TYPE	ICE_CREAM_TYPE
'Chocolate'	charming	basic
'Chocolate'	charming	basic
'Vanilla'	impulsive	basic
'Vanilla'	impulsive	basic
'Rocky road'	aggressive	custard
'Rocky road'	aggressive	custard
'Almond fudge'	loving	custard
'Almond fudge'	loving	custard
'Strawberry'	introvert	fruity
'Strawberry'	introvert	fruity
'Chocolate'	charming	basic
'Chocolate'	charming	basic
'Vanilla'	impulsive	basic
'Vanilla'	impulsive	basic
'Rocky road'	aggressive	custard
'Rocky road'	aggressive	custard
'Almond fudge'	loving	custard
'Almond fudge'	loving	custard
'Strawberry'	introvert	fruity
'Strawberry'	introvert	fruity

Q3:

Find flavour type , personality type ,Color type by age group and mood type and Ice cream type

-input

- Age group--> child
- Mood type--> sad
- Ice cream type--> custard

Output:

- Flavour Ice cream type
- personality type
- Color type

The screenshot shows the SWISH interface with a code editor and a data viewer.

Code:

```

1st(S):-write('What is your personality type?'),read(P),write('what age Group
2lify?'),read(A),write('what kind of color do you prefer?'),read(C),write('How
3:'),read(M),write('what ice cream type do you prefer?'),read(T),flavor(S,P,A,
4
5 mood
6 ('Chocolate',P,A,C,M,T):-P=charming,A=child,C=light,M=sad,T= basic.
7 ('Vanilla',P,A,C,M,T):-P=impulsive,A=child,C=light,M=sad,T= basic.
8 ('Rocky road',P,A,C,M,T):-P=aggressive,A=child,C=light,M=sad,T= custard.
9 ('Almond fudge',P,A,C,M,T):-P=loving,A=child,C=light,M=sad,T= custard.
10 ('Strawberry',P,A,C,M,T):-P=introvert,A=child,C=light,M=sad,T= fruity.
11
12 ('Chocolate',P,A,C,M,T):-P=charming,A=teen,C=light,M=sad,T= basic.
13 ('Vanilla',P,A,C,M,T):-P=impulsive,A=teen,C=light,M=sad,T= basic.
14 ('Rocky road',P,A,C,M,T):-P=aggressive,A=teen,C=light,M=sad,T= custard.
15 ('Almond fudge',P,A,C,M,T):-P=loving,A=teen,C=light,M=sad,T= custard.
16 ('Strawberry',P,A,C,M,T):-P=introvert,A=teen,C=light,M=sad,T= fruity.
17
18 ('Chocolate',P,A,C,M,T):-P=charming,A=adult,C=light,M=sad,T= basic.
19 ('Vanilla',P,A,C,M,T):-P=impulsive,A=adult,C=light,M=sad,T= basic.
20 ('Rocky road',P,A,C,M,T):-P=aggressive,A=adult,C=light,M=sad,T= custard.
21 ('Almond fudge',P,A,C,M,T):-P=loving,A=adult,C=light,M=sad,T= custard.
22 ('Strawberry',P,A,C,M,T):-P=introvert,A=adult,C=light,M=sad,T= fruity.
23
24
25 / mood
26 ('Chocolate',P,A,C,M,T):-P=charming,A=child,C=dark,M=happy,T= basic.
27 ('Vanilla',P,A,C,M,T):-P=impulsive,A=child,C=dark,M=happy,T= basic.
28 ('Rocky road',P,A,C,M,T):-P=aggressive,A=child,C=dark,M=happy,T= custard.
29 ('Almond fudge',P,A,C,M,T):-P=loving,A=child,C=dark,M=happy,T= custard.
30 ('Strawberry',P,A,C,M,T):-P=introvert,A=child,C=dark,M=happy,T= fruity.
31
32 ('Chocolate',P,A,C,M,T):-P=charming,A=teen,C=dark,M=happy,T= basic.
33 ('Vanilla',P,A,C,M,T):-P=impulsive,A=teen,C=dark,M=happy,T= basic.

```

Data View:

FLAVOUR_TYPE	PERSONALITY_TYPE	COLOR_TYPE
'Rocky road'	aggressive	light
'Almond fudge'	loving	light

QUERY EXAMPLES:

Q4:

To find flavour liked by more age group:

*Note: no matter of the personality Type

Input :

- Mood Type-->happy
- Color Type-->dark
- Ice cream type--> basic

Output:

- Flavour Type
- Age Group 1
- Age group 2

The screenshot shows the SWISH interface with a code editor and a data viewer.

Code:

```

1 suggest(S):-write('What is your personality type?'),read(P),write('what age Group d
2 classify?'),read(A),write('what kind of color do you prefer?'),read(C),write('How i
3 mood?'),read(M),write('what ice cream type do you prefer?'),read(T),flavor(S,P,A,
4
5 %Sad Mood
6 flavor('Chocolate',P,A,C,M,T):-P=charming,A=child,C=light,M=sad,T= basic.
7 flavor('Vanilla',P,A,C,M,T):-P=impulsive,A=child,C=light,M=sad,T= basic.
8 flavor('Rocky road',P,A,C,M,T):-P=aggressive,A=child,C=light,M=sad,T= custard.
9 flavor('Almond fudge',P,A,C,M,T):-P=loving,A=child,C=light,M=sad,T= custard.
10 flavor('Strawberry',P,A,C,M,T):-P=introvert,A=child,C=light,M=sad,T= fruity.
11
12 flavor('Chocolate',P,A,C,M,T):-P=charming,A=teen,C=light,M=sad,T= basic.
13 flavor('Vanilla',P,A,C,M,T):-P=impulsive,A=teen,C=light,M=sad,T= basic.
14 flavor('Rocky road',P,A,C,M,T):-P=aggressive,A=teen,C=light,M=sad,T= custard.
15 flavor('Almond fudge',P,A,C,M,T):-P=loving,A=teen,C=light,M=sad,T= custard.
16 flavor('Strawberry',P,A,C,M,T):-P=introvert,A=teen,C=light,M=sad,T= fruity.
17
18 flavor('Chocolate',P,A,C,M,T):-P=charming,A=adult,C=light,M=sad,T= basic.
19 flavor('Vanilla',P,A,C,M,T):-P=impulsive,A=adult,C=light,M=sad,T= basic.
20 flavor('Rocky road',P,A,C,M,T):-P=aggressive,A=adult,C=light,M=sad,T= custard.
21 flavor('Almond fudge',P,A,C,M,T):-P=loving,A=adult,C=light,M=sad,T= custard.
22 flavor('Strawberry',P,A,C,M,T):-P=introvert,A=adult,C=light,M=sad,T= fruity.
23
24
25 %Happy mood
26 flavor('Chocolate',P,A,C,M,T):-P=charming,A=child,C=dark,M=happy,T= basic.
27 flavor('Vanilla',P,A,C,M,T):-P=impulsive,A=child,C=dark,M=happy,T= basic.
28 flavor('Rocky road',P,A,C,M,T):-P=aggressive,A=child,C=dark,M=happy,T= custard.
29 flavor('Almond fudge',P,A,C,M,T):-P=loving,A=child,C=dark,M=happy,T= custard.
30 flavor('Strawberry',P,A,C,M,T):-P=introvert,A=child,C=dark,M=happy,T= fruity.
31
32 flavor('Chocolate',P,A,C,M,T):-P=charming,A=teen,C=dark,M=happy,T= basic.
33 flavor('Vanilla',P,A,C,M,T):-P=impulsive,A=teen,C=dark,M=happy,T= basic.

```

Data View:

FLAVOUR_TYPE	AGE_GROUP1	AGE_GROUP2
'Chocolate'	child	teen
'Chocolate'	child	adult
'Vanilla'	child	adult
'Chocolate'	teen	adult
'Chocolate'	teen	adult
'Vanilla'	teen	adult
'Chocolate'	adult	child
'Vanilla'	adult	teen

Q5:

Find personality type , Ice cream type by Age group and Mood type.

* Note: no matter of the ice cream type flavor or color type.

-input

- Age groups--> Teen
- Mood type--> happy

Output:

- personality Type
- Ice cream Type

The screenshot shows the SWISH interface with a query editor and several tables. The query is:

```

How to Solve a Ma... Miro Templates Libr... Untitled Project - C... input (new)
Ra Program Program +
5 food
6 ('Chocolate',P,A,C,M,T):-P=charming,A=child,C=light,M=sad,T= basic.
7 ('Vanilla',P,A,C,M,T):-P=impulsive,A=child,C=light,M=sad,T= basic.
8 ('Rocky road',P,A,C,M,T):-P=aggressive,A=child,C=light,M=sad,T= custard.
9 ('Almond fudge',P,A,C,M,T):-P=loving,A=child,C=light,M=sad,T= custard.
10 ('Strawberry',P,A,C,M,T):-P=introvert,A=child,C=light,M=sad,T= fruity.
11
12 ('Chocolate',P,A,C,M,T):-P=charming,A=teen,C=light,M=sad,T= basic.
13 ('Vanilla',P,A,C,M,T):-P=impulsive,A=teen,C=light,M=sad,T= basic.
14 ('Rocky road',P,A,C,M,T):-P=aggressive,A=teen,C=light,M=sad,T= custard.
15 ('Almond fudge',P,A,C,M,T):-P=loving,A=teen,C=light,M=sad,T= custard.
16 ('Strawberry',P,A,C,M,T):-P=introvert,A=teen,C=light,M=sad,T= fruity.
17
18 ('Chocolate',P,A,C,M,T):-P=charming,A=adult,C=light,M=sad,T= basic.
19 ('Vanilla',P,A,C,M,T):-P=impulsive,A=adult,C=light,M=sad,T= basic.
20 ('Rocky road',P,A,C,M,T):-P=aggressive,A=adult,C=light,M=sad,T= custard.
21 ('Almond fudge',P,A,C,M,T):-P=loving,A=adult,C=light,M=sad,T= custard.
22 ('Strawberry',P,A,C,M,T):-P=introvert,A=adult,C=light,M=sad,T= fruity.
23
24
25 / mood
26 ('Chocolate',P,A,C,M,T):-P=charming,A=child,C=dark,M=happy,T= basic.
27 ('Vanilla',P,A,C,M,T):-P=impulsive,A=child,C=dark,M=happy,T= basic.
28 ('Rocky road',P,A,C,M,T):-P=aggressive,A=child,C=dark,M=happy,T= custard.
29 ('Almond fudge',P,A,C,M,T):-P=loving,A=child,C=dark,M=happy,T= custard.
30 ('Strawberry',P,A,C,M,T):-P=introvert,A=child,C=dark,M=happy,T= fruity.
31
32 ('Chocolate',P,A,C,M,T):-P=charming,A=teen,C=dark,M=happy,T= basic.
33 ('Vanilla',P,A,C,M,T):-P=impulsive,A=teen,C=dark,M=happy,T= basic.
34 ('Rocky road',P,A,C,M,T):-P=aggressive,A=teen,C=dark,M=happy,T= custard.
35 ('Almond fudge',P,A,C,M,T):-P=loving,A=teen,C=dark,M=happy,T= custard.
36 ('Strawberry',P,A,C,M,T):-P=introvert,A=teen,C=dark,M=happy,T= fruity.
37
('Chocolate',P,A,C,M,T):-P=charming,A=adult,C=dark,M=happy,T= basic.

```

The results show three tables: FLAVOUR_TYPE1, PERSONALITY_TYPE, and COLOR_TYPE. The FLAVOUR_TYPE1 table has two rows: 'Rocky road' (aggressive) and 'Almond fudge' (loving). The PERSONALITY_TYPE table has five rows: charming (basic), impulsive (basic), aggressive (custard), loving (custard), and introvert (fruity). The COLOR_TYPE table has five rows: charming (basic), impulsive (basic), aggressive (custard), loving (custard), and introvert (fruity).

QUERY EXAMPLES:

Q6:

Find Flavour type , personality type by age group and ice cream type and Color type

*Note: No matter of the mood type

Input :

- Age group -->teen
- Ice cream type--> fruity
- Color type-> light

Output:

- Flavour type
- personality type

The screenshot shows the SWISH interface with a query editor and several tables. The query is:

```

How to Solve a Ma... Miro Templates Libr... Untitled Project - C... input (new)
Ra Program Program +
# suggest(S):-write('What is your personality type? '),read(P),write('what age Group d
2 classify?'),read(A),write('what kind of color do you prefer?'),read(C),write('How i
3 mood?'),read(M),write('what ice cream type do you prefer?'),read(T),flavor(S,P,A,C,
4
5 %Sad Mood
6 flavor('Chocolate',P,A,C,M,T):-P=charming,A=child,C=light,M=sad,T= basic.
7 flavor('Vanilla',P,A,C,M,T):-P=impulsive,A=child,C=light,M=sad,T= basic.
8 flavor('Rocky road',P,A,C,M,T):-P=aggressive,A=child,C=light,M=sad,T= custard.
9 flavor('Almond fudge',P,A,C,M,T):-P=loving,A=child,C=light,M=sad,T= custard.
10 flavor('Strawberry',P,A,C,M,T):-P=introvert,A=child,C=light,M=sad,T= fruity.
11
12 flavor('Chocolate',P,A,C,M,T):-P=charming,A=teen,C=light,M=sad,T= basic.
13 flavor('Vanilla',P,A,C,M,T):-P=impulsive,A=teen,C=light,M=sad,T= basic.
14 flavor('Rocky road',P,A,C,M,T):-P=aggressive,A=teen,C=light,M=sad,T= custard.
15 flavor('Almond fudge',P,A,C,M,T):-P=loving,A=teen,C=light,M=sad,T= custard.
16 flavor('Strawberry',P,A,C,M,T):-P=introvert,A=teen,C=light,M=sad,T= fruity.
17
18 flavor('Chocolate',P,A,C,M,T):-P=charming,A=adult,C=light,M=sad,T= basic.
19 flavor('Vanilla',P,A,C,M,T):-P=impulsive,A=adult,C=light,M=sad,T= basic.
20 flavor('Rocky road',P,A,C,M,T):-P=aggressive,A=adult,C=light,M=sad,T= custard.
21 flavor('Almond fudge',P,A,C,M,T):-P=loving,A=adult,C=light,M=sad,T= custard.
22 flavor('Strawberry',P,A,C,M,T):-P=introvert,A=adult,C=light,M=sad,T= fruity.
23
24
25 %Happy mood
26 flavor('Chocolate',P,A,C,M,T):-P=charming,A=child,C=dark,M=happy,T= basic.
27 flavor('Vanilla',P,A,C,M,T):-P=impulsive,A=child,C=dark,M=happy,T= basic.
28 flavor('Rocky road',P,A,C,M,T):-P=aggressive,A=child,C=dark,M=happy,T= custard.
29 flavor('Almond fudge',P,A,C,M,T):-P=loving,A=child,C=dark,M=happy,T= custard.
30 flavor('Strawberry',P,A,C,M,T):-P=introvert,A=child,C=dark,M=happy,T= fruity.
31
32 flavor('Chocolate',P,A,C,M,T):-P=charming,A=teen,C=dark,M=happy,T= basic.
33 flavor('Vanilla',P,A,C,M,T):-P=impulsive,A=teen,C=dark,M=happy,T= basic.

```

The results show four tables: AGE_GROUP, COLOR_TYPE, MOOD_TYPE, and FLAVOUR_TYPE. The AGE_GROUP table has five rows: child (light), teen (light), adult (light), child (dark), teen (dark), and adult (dark). The COLOR_TYPE table has five rows: light (sad), light (sad), light (sad), dark (happy), and dark (happy). The MOOD_TYPE table has five rows: light (sad), light (sad), light (sad), dark (happy), and dark (happy). The FLAVOUR_TYPE table has five rows: 'Strawberry' (introvert), 'Strawberry' (introvert), 'Strawberry' (introvert), 'Strawberry' (introvert), and 'Strawberry' (introvert).

Q7:

To find Age group , Color type , Mood type by Flavour Type , Personality type , Ice cream type

-input

- flavour type → ‘Rocky road’
- personality type → aggressive
- ice cream type → custard

Output:

- Age group
- Color type
- Mood type

The screenshot shows the SWISH interface with a Prolog program and several tables of results.

```

1 suggest(S):-write('What is your personality type?'),read(P),write('what age Group d
2 classify?'),read(A),write('what kind of color do you prefer?'),read(C),write('How i
3 mood?'),read(M),write('what ice cream type do you prefer?'),read(T),flavor(S,P,A,C,
4
5 %Sad Mood
6 flavor('Chocolate',P,A,C,M,T):-P=charming,A=child,C=light,M=sad,T= basic.
7 flavor('Vanilla',P,A,C,M,T):-P=impulsive,A=child,C=light,M=sad,T= basic.
8 flavor('Rocky road',P,A,C,M,T):-P=aggressive,A=child,C=light,M=sad,T= custard.
9 flavor('Almond fudge',P,A,C,M,T):-P=loving,A=child,C=light,M=sad,T= custard.
10 flavor('Strawberry',P,A,C,M,T):-P=introvert,A=child,C=light,M=sad,T= fruity.
11
12 flavor('Chocolate',P,A,C,M,T):-P=charming,A=teen,C=light,M=sad,T= basic.
13 flavor('Vanilla',P,A,C,M,T):-P=impulsive,A=teen,C=light,M=sad,T= basic.
14 flavor('Rocky road',P,A,C,M,T):-P=aggressive,A=teen,C=light,M=sad,T= custard.
15 flavor('Almond fudge',P,A,C,M,T):-P=loving,A=teen,C=light,M=sad,T= custard.
16 flavor('Strawberry',P,A,C,M,T):-P=introvert,A=teen,C=light,M=sad,T= fruity.
17
18 flavor('Chocolate',P,A,C,M,T):-P=charming,A=adult,C=light,M=sad,T= basic.
19 flavor('Vanilla',P,A,C,M,T):-P=impulsive,A=adult,C=light,M=sad,T= basic.
20 flavor('Rocky road',P,A,C,M,T):-P=aggressive,A=adult,C=light,M=sad,T= custard.
21 flavor('Almond fudge',P,A,C,M,T):-P=loving,A=adult,C=light,M=sad,T= custard.
22 flavor('Strawberry',P,A,C,M,T):-P=introvert,A=adult,C=light,M=sad,T= fruity.
23
24
25 %Happy mood
26 flavor('Chocolate',P,A,C,M,T):-P=charming,A=child,C=dark,M=happy,T= basic.
27 flavor('Vanilla',P,A,C,M,T):-P=impulsive,A=child,C=dark,M=happy,T= basic.
28 flavor('Rocky road',P,A,C,M,T):-P=aggressive,A=child,C=dark,M=happy,T= custard.
29 flavor('Almond fudge',P,A,C,M,T):-P=loving,A=child,C=dark,M=happy,T= custard.
30 flavor('Strawberry',P,A,C,M,T):-P=introvert,A=child,C=dark,M=happy,T= fruity.
31
32 flavor('Chocolate',P,A,C,M,T):-P=charming,A=teen,C=dark,M=happy,T= basic.
33 flavor('Vanilla',P,A,C,M,T):-P=impulsive,A=teen,C=dark,M=happy,T= basic.

```

FLAVOUR_TYPE

'Chocolate'	1
'Chocolate'	2
'Vanilla'	3
'Vanilla'	4

flavor('Rocky road',PERSONALITY_TYPE,child,light,sad,ICE_CREAM_TYPE)

PERSONALITY_TYPE	ICE_CREAM_TYPE
aggressive	custard

flavor('Rocky road',PERSONALITY_TYPE,child,light,sad,ICE_CREAM_TYPE).

PERSONALITY_TYPE	ICE_CREAM_TYPE
aggressive	custard

false

flavor('Rocky road',aggressive,AGE_GROUP,COLOR_TYPE,MOOD_TYPE,custard).

AGE_GROUP	COLOR_TYPE	MOOD_TYPE
child	light	sad
teen	light	sad
adult	light	sad
child	dark	happy
teen	dark	happy
adult	dark	happy

?- flavor('Rocky road',aggressive,AGE_GROUP,COLOR_TYPE,MOOD_TYPE,custard).

QUERY EXAMPLES:

Q8:

Compound Queries with 4 variables

Find flavour type, Age group , Color type ,Ice cream type by Personality type and Mood type

Input :

- personality Type-->aggressive
- Mood Type-->happy

Output:

- Flavour Type
- Age group
- Color Type
- Ice cream Type

The screenshot shows the SWISH interface with a Prolog program and several tables of results.

```

1 suggest(S):-write('What is your personality type?'),read(P),write('what age Group d
2 classify?'),read(A),write('what kind of color do you prefer?'),read(C),write('How i
3 mood?'),read(M),write('what ice cream type do you prefer?'),read(T),flavor(S,P,A,C,
4
5 %Sad Mood
6 flavor('Chocolate',P,A,C,M,T):-P=charming,A=child,C=light,M=sad,T= basic.
7 flavor('Vanilla',P,A,C,M,T):-P=impulsive,A=child,C=light,M=sad,T= basic.
8 flavor('Rocky road',P,A,C,M,T):-P=aggressive,A=child,C=light,M=sad,T= custard.
9 flavor('Almond fudge',P,A,C,M,T):-P=loving,A=child,C=light,M=sad,T= custard.
10 flavor('Strawberry',P,A,C,M,T):-P=introvert,A=child,C=light,M=sad,T= fruity.
11
12 flavor('Chocolate',P,A,C,M,T):-P=charming,A=teen,C=light,M=sad,T= basic.
13 flavor('Vanilla',P,A,C,M,T):-P=impulsive,A=teen,C=light,M=sad,T= basic.
14 flavor('Rocky road',P,A,C,M,T):-P=aggressive,A=teen,C=light,M=sad,T= custard.
15 flavor('Almond fudge',P,A,C,M,T):-P=loving,A=teen,C=light,M=sad,T= custard.
16 flavor('Strawberry',P,A,C,M,T):-P=introvert,A=teen,C=light,M=sad,T= fruity.
17
18 flavor('Chocolate',P,A,C,M,T):-P=charming,A=adult,C=light,M=sad,T= basic.
19 flavor('Vanilla',P,A,C,M,T):-P=impulsive,A=adult,C=light,M=sad,T= basic.
20 flavor('Rocky road',P,A,C,M,T):-P=aggressive,A=adult,C=light,M=sad,T= custard.
21 flavor('Almond fudge',P,A,C,M,T):-P=loving,A=adult,C=light,M=sad,T= custard.
22 flavor('Strawberry',P,A,C,M,T):-P=introvert,A=adult,C=light,M=sad,T= fruity.
23
24
25 %Happy mood
26 flavor('Chocolate',P,A,C,M,T):-P=charming,A=child,C=dark,M=happy,T= basic.
27 flavor('Vanilla',P,A,C,M,T):-P=impulsive,A=child,C=dark,M=happy,T= basic.
28 flavor('Rocky road',P,A,C,M,T):-P=aggressive,A=child,C=dark,M=happy,T= custard.
29 flavor('Almond fudge',P,A,C,M,T):-P=loving,A=child,C=dark,M=happy,T= custard.
30 flavor('Strawberry',P,A,C,M,T):-P=introvert,A=child,C=dark,M=happy,T= fruity.
31
32 flavor('Chocolate',P,A,C,M,T):-P=charming,A=teen,C=dark,M=happy,T= basic.
33 flavor('Vanilla',P,A,C,M,T):-P=impulsive,A=teen,C=dark,M=happy,T= basic.

```

flavor('Rocky road',aggressive,AGE_GROUP,COLOR_TYPE,MOOD_TYPE,custard).

AGE_GROUP	COLOR_TYPE	MOOD_TYPE
child	light	sad
teen	light	sad
adult	light	sad
child	dark	happy
teen	dark	happy
adult	dark	happy

flavor(FLAVOUR_TYPE,PERSONALITY_TYPE,teen,_,_fruity).

FLAVOUR_TYPE	PERSONALITY_TYPE
'Strawberry'	introvert
'Strawberry'	introvert

flavor(FLAVOUR_TYPE,PERSONALITY_TYPE,teen,_,_sad,fruity).

FLAVOUR_TYPE	PERSONALITY_TYPE
'Strawberry'	introvert

false

flavor(FLAVOUR_TYPE,PERSONALITY_TYPE,teen,light,_).

FLAVOUR_TYPE	PERSONALITY_TYPE
'Strawberry'	introvert

false

?- flavor(FLAVOUR_TYPE,PERSONALITY_TYPE,teen,light,_).