

Nutrition Level



What if someone
analysed and gave
you a proper menu
keeping in mind the
nutrition intake !!

THE OPTIMAL MENU

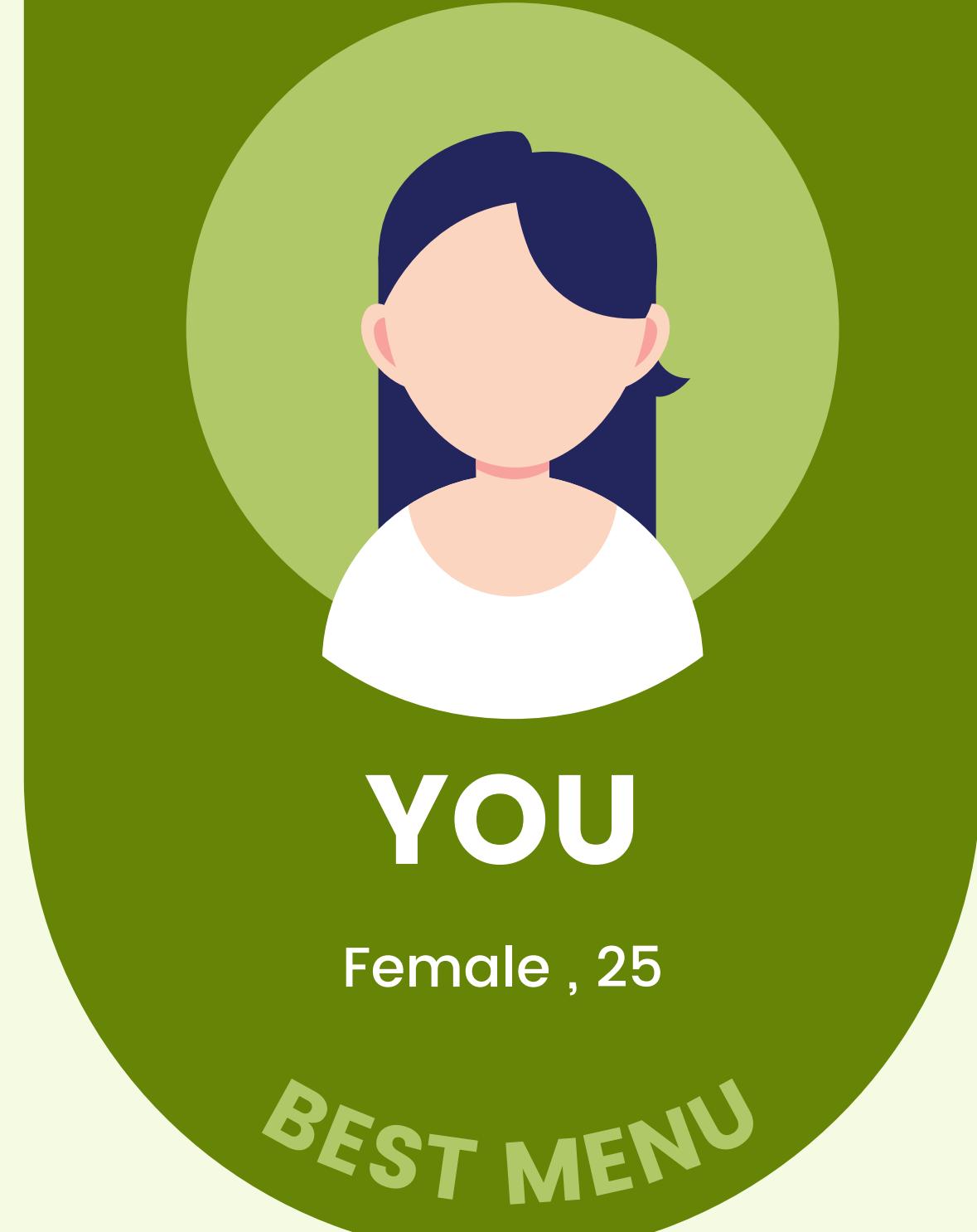


Amazing !!

@thenutritiouslife

EATWELL FOOD YOUR NUTRITION GUIDE

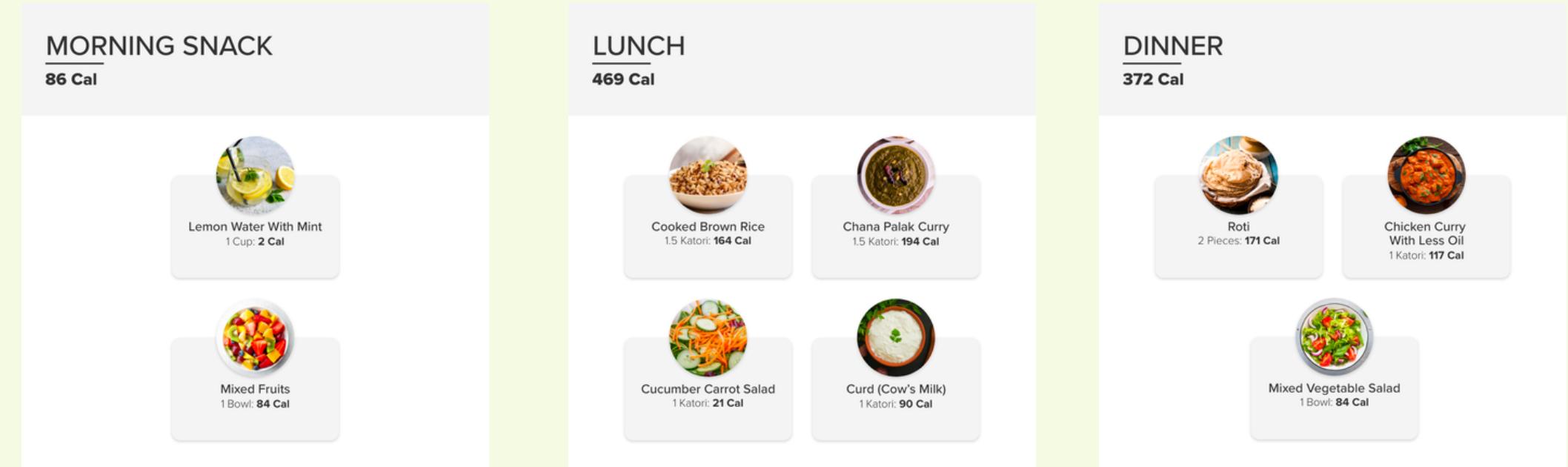




Different for People
#Factors

Nutrient Requirements

Based on Taste & Preferences
#Multiple Options



Healthy Dinner Options		
Option 1	+ +	2 Roti 1 Katori Rajma Curry Cucumber Salad
Option 2	+ +	1 Katori White Rice 1 Katori Moong Palak Dal Carrot Radish Salad
Option 3	+ +	1 Ragi Roti Bottle gourd Dal Curry Cucumber Tomato Salad

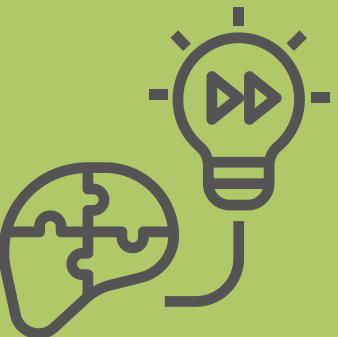
THE APPROACHES

Optimiser



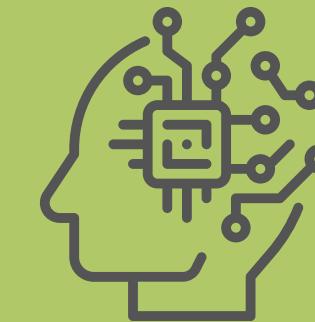
- Formulates a mathematical optimization problem
- Uses constraints to represent requirements or limitations.
- Optimization solver used to find the optimal solution.
- Provides guaranteed optimal solution.

Meta-heuristics



- Uses search algorithm to iteratively improve upon a given solution.
- Does not guarantee finding the optimal solution.
- Can provide good approximations within a reasonable amount of time.
- Common algorithms include genetic algorithms, simulated annealing, and particle swarm optimization.

AI-ML



- Trains a ML model on a dataset of food items and nutrient values.
- Predicts nutrient content of a new diet plan given its list of food items.
- Adjusts the plan until it meets the user's dietary requirements.
- Personalized to individual users based on their unique dietary needs and preferences.

OPTIMISER

Nutrient Available From Food

- Gender] Considering these two major factors
- Age
- Weight
- Height
- Activity

Lie In

Nutrient Required by People

- Location (availability of food item)
- Cost
- Nutritional Value (Cal | Proteins ...)
- Taste] Captured by
- Preferences] ML Model

Formulation Constraint Programming

Decision Variables

"What Food Items"

"What Quantity"

Subject to

Given : List of Food Items available with their nutrition value & cost

Requirements met as per data of recommended nutrient consumption

Decision Variables	Servings [Food Item i]	Requirements
Subject to		
Calories	$\sum \text{Servings [Food Item i]} * \text{Calories [i]}$	$\geq \leq$
Protiens	$\sum \text{Servings [Food Item i]} * \text{Proteins [i]}$	$\geq \leq$
Fats	$\sum \text{Servings [Food Item i]} * \text{Fats [i]}$	$\geq \leq$
Carbs	$\sum \text{Servings [Food Item i]} * \text{Carbs [i]}$	$\geq \leq$
Fibers	$\sum \text{Servings [Food Item i]} * \text{Fibers [i]}$	$\geq \leq$
Cost	$\sum \text{Servings [Food Item i]} * \text{Cost [i]}$	$\geq \leq$

Enter Gender

M]

Search through Corresponding
sheet for Lower and Upper Limits

Enter Age

25]

Enter Budget Range 50-100 \$

Will Generate Multiple Optimal Solutions

https://github.com/proffapt/mip_optimisation

REQUIREMENT DATASHEET

Male

Age Lower	Age Upper	Protein Lower	Protein Upper	Calories Lower	Calories Upper	Carbohydrates Lower	Carbohydrates Upper	Fat Lower	Fat Upper	Fiber Lower	Fiber Upper
2	3	13	19	1000	1400	130	200	30	40	14	20
4	8	16	28	1200	1800	130	300	25	35	19	25
9	13	27	46	1600	2200	130	400	25	35	25	31
14	18	52	82	1800	2800	130	500	25	35	30	38
19	30	56	82	2000	3000	130	550	20	35	38	38
31	50	56	82	2000	3000	130	550	20	35	38	38
51	70	56	82	2000	2800	130	500	20	35	30	38
71	90	56	82	2000	2800	130	500	20	35	30	38

FOOD ITEM DATASHEET

Food	Protein	Calories	Carbohydrate	Fat	Fiber	Cost
Food_Item_1	0.26	381	91.27	0.05	0.9	3.4
Food_Item_2	9.17	691	13.86	71.97	9.6	6.4
Food_Item_3	0.98	25	5.88	0.18	3	15.3
Food_Item_4	13.3	367	73.13	2.38	8	5.9
Food_Item_5	1.1	144	30.4	2	1.3	1.4
Food_Item_6	1.92	25	4.97	0.28	2	20.3
Food_Item_7	4.98	42	6.7	0.74	3.7	7.3
Food_Item_8	16.56	282	0	23.41	0	7.5
Food_Item_9	19.8	300	0.46	24.26	0	7.4
Food_Item_10	23	290	9	18	6.1	12.4
Food_Item_11	0	25	6.25	0	3.1	7.5
Food_Item_12	14.26	349	77.06	0.39	13	7.8
Food_Item_13	0.11	51	13.12	0.06	0.3	7.1
Food_Item_14	13.5	407	72.3	7.2	0	15.3
Food_Item_15	19.4	215	0.2	14.6	0	25.2

THE GOAL



Only Optimiser
nutrients



Only AL-ML
User Taste



Both
nutrients
+ user taste

The Optimiser and the Meta Heuristic Approach will act as a toolkit for doctors / AI Models to give optimised meals including User Preference and Taste

Group 6

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THANK YOU
FOR YOUR ATTENTION

