AMRITA VISHWA VIDYAPEETHAM

19AIE212 – Design and Analysis of Algorithms

DIET AND FITNESS PLANNER

TEAM INFINTY

APOORVA M AIE19007
TANUJ M AIE19041
AISHWARYA V AIE19068

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INTRODUCTION

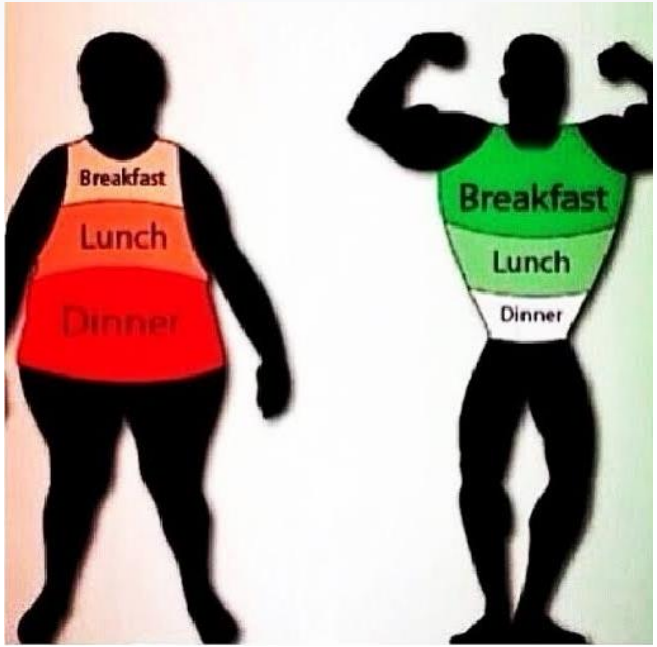
"He who has health, has hope; and he who has hope, has everything"

- Running behind the growing technological life has made us ignore our health.
- Aim: Developing a customized diet and fitness planner that can be followed everyday with ease to reach a weekly target

DIET

- Following a strict diet and to not cheat is tedious.
- How the planner over comes it:

1. Providing customized cuisines and not compromising on protein.
2. Follows a 2:2:1 ratio for designing breakfast lunch and dinner respectively



FITNESS

- Physical activity and exercise can have immediate and long-term health benefits. But following a regular fitness regime can be hard
- Constraints:

  Availability of equipment.

  Time
- How the planner over comes it:

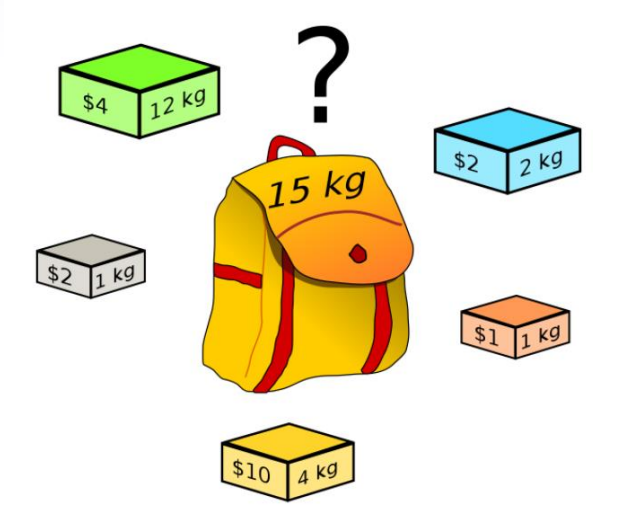
  Provides many categories physical activities.

  Fitness and diet design are made interdependent

FRACTIONAL KNAPSACK

Input: Weights $w_1, \ldots, w_n$ and values $v_1, \ldots, v_n$ of n items; capacity W.

Output: The maximum total value of fractions of items that fit into a bag of capacity W.



EXAMPLE

Item	A	B	C	D
Profit	280	100	120	120
Weight	40	10	20	24
Ratio $(\frac{p_i}{w_i})$	7	10	6	5

Item	B	A	C	D
Profit	100	280	120	120
Weight	10	40	20	24
Ratio $(\frac{p_i}{w_i})$	10	7	6	5

knapsack ***W*** **= 60**

The total weight of the selected items is **10 + 40 + 20 * (10/20) = 60**

And the total profit is **100 + 280 + 120 * (10/20) = 380 + 60 = 440**

PSEUDO CODE

```
Algorithm: Greedy-Fractional-Knapsack (W[1..n], V[1..n], Capacity)
for i = 1 to n
   calculate cost[i] = V[i]/W[i]
Sort(Descending) - cost
for i = 1 to n
   do x[i] = 0
weight = 0
for i = 1 to n
   if W[i] ≤ Capacity then
      x[i] = 1
      max_value = max_value + V[i]
      Capacity = Capacity - W[i]
   else
      x[i] = Capacity/ W[i]
      max_value = max_value + V[i]*Capacity/W[i]
      break
return max_value,x
```

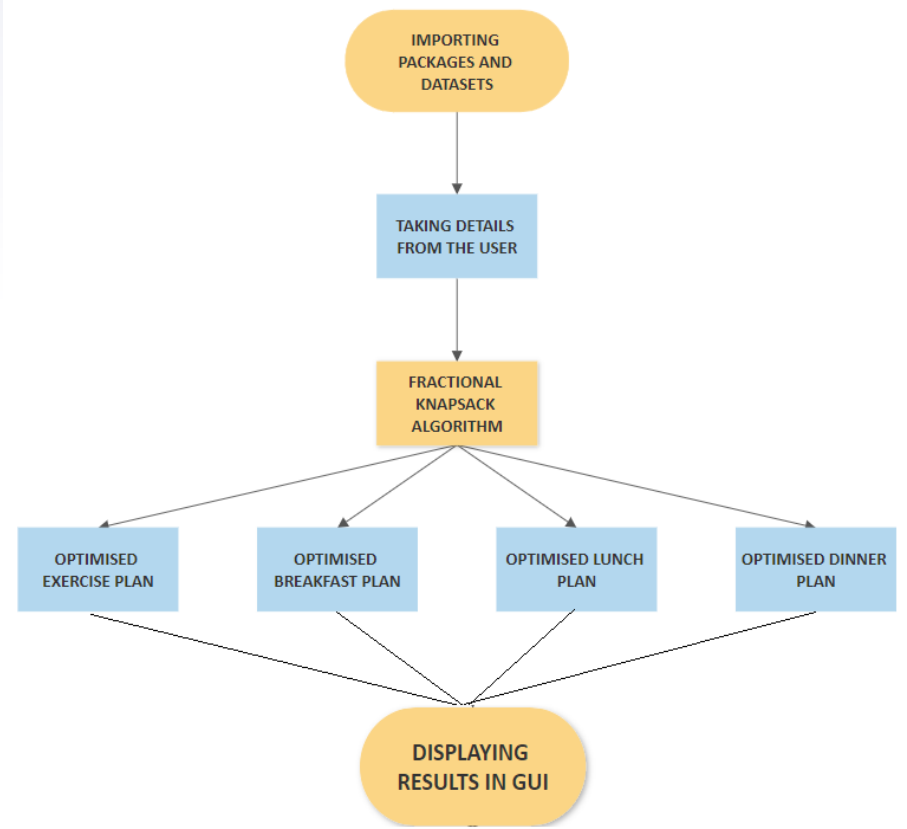
TIME COMPLEXITY: O(nlogn) + O(n) = O(nlogn)

DATASET

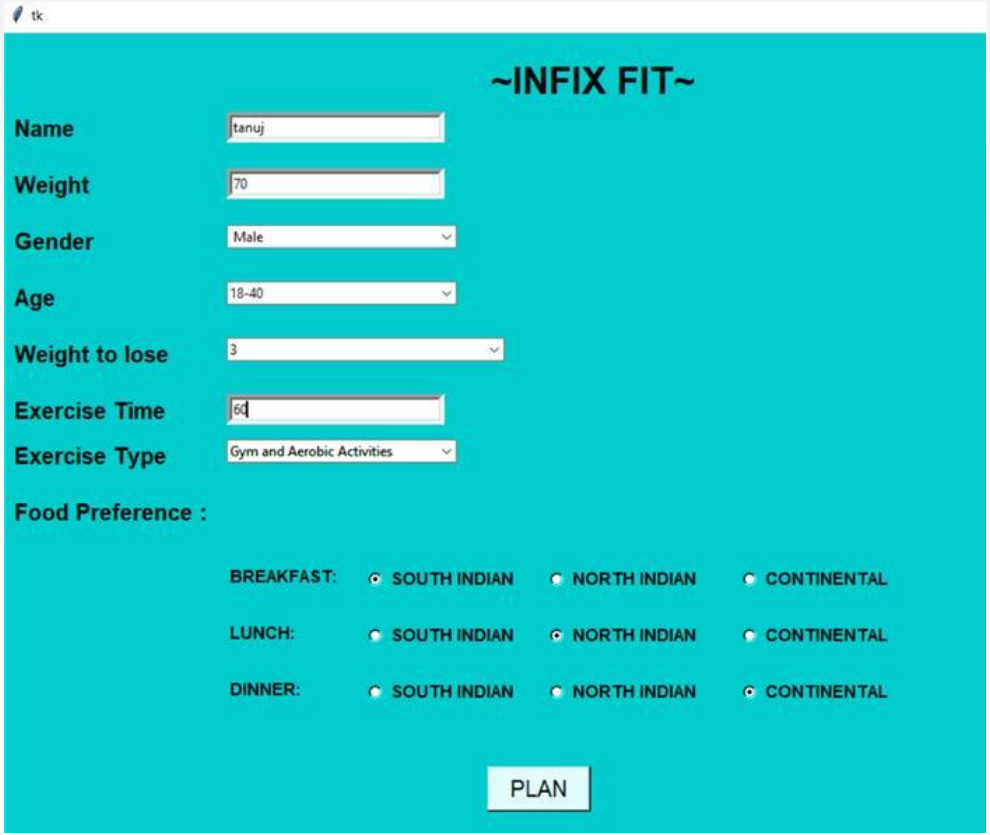
1	Activity	Calories per lb	category	Time(min)
2	Cycling, 12-13.9 mph, moderate	3.625215584	Gym and Aerobic	45
3	Unicycling	2.265387389	Gym and Aerobic	60
4	Stationary cycling, moderate	3.170946581	Gym and Aerobic	50
5	Calisthenics, vigorous, pushups, situps	3.625215584	Gym and Aerobic	40
6	Calisthenics, light	1.586217994	Gym and Aerobic	60
7	Circuit training, minimal rest	3.625215584	Gym and Aerobic	40
8	Golf, general	2.040486997	Sports	45
9	Racquetball, competitive	3.530774777	Sports	30
10	Playing racquetball	3.170946581	Sports	60
11	Rock climbing, ascending rock	4.983554374	Adventurous	50
12	Rock climbing, rappelling	3.625215584	Adventurous	45
13	Climbing hills, carrying 10 to 20 lb	3.398825786	Adventurous	40
14	Walking downstairs	1.358338789	general	30

1	FOOD	CALORIES	CATEGORY	PROTEIN
2	Dosa Plain (1)	200	South Indian	65
3	Idli(2)	140	South Indian	81
4	MILK(cup with out sug	60	South Indian	78
5	Uttapam(1)	300	South Indian	21
6	Sambar(1 cup)	200	South Indian	25
7	Egg Yolk cooked (2)	160	Continental	72
8	orenge juice	40	Continental	51
9	Poha (1 dish)	140	North Indian	77
10	Chappati (2)	220	North Indian	39

SYSTEM MODEL



RESULTS


tk
~INFIX FIT~
Name
tanuj
Weight
70
Gender
Male
Age
18-40
Weight to lose
3
Exercise Time
60
Exercise Type
Gym and Aerobic Activities
Food Preference :
BREAKFAST:
SOUTH INDIAN
NORTH INDIAN
CONTINENTAL
LUNCH:
SOUTH INDIAN
NORTH INDIAN
CONTINENTAL
DINNER:
SOUTH INDIAN
NORTH INDIAN
CONTINENTAL
PLAN

RESULTS

tk

WORKOUT PLAN

	Exe_list	Time of workout(in mins)	calories burnt
18	Running, 8 mph (7.5 min mile)	20.0	470
21	Running, stairs, up	40.0	1046

DIET PLAN FOR A DAY

----------500 ML OF WATER ----------

BREAKFAST PLAN

	FOOD	QUANTITY	CALORIES	PROTEIN	CATEGORY
0	Dosa Plain (1)	1.000000	200.000000	65.000000	South Indian
1	Idli(2)	1.000000	140.000000	81.000000	South Indian
2	MILK(cup with out sugar)	1.000000	60.000000	78.000000	South Indian
5	Vada(1)	0.497778	59.733333	9.457778	South Indian

----------500 ML OF WATER ----------

LUNCH PLAN

	FOOD	QUANTITY	CALORIES	PROTEIN	CATEGORY
0	Salad 1 cup	1.00000	100.000000	81.000000	North Indian
2	phulka with curry(2)	1.00000	160.000000	65.000000	North Indian
4	Chappati(2) with curry	0.56697	124.733333	25.513636	North Indian
6	chicken soup 1 cup	1.00000	75.000000	54.000000	North Indian

----------500 ML OF WATER ----------

DINNER PLAN

	FOOD	QUANTITY	CALORIES	PROTEIN	CATEGORY
0	Tuna Salad	0.245276	45.866667	24.037077	Continental
1	Tuna Fish	1.000000	184.000000	111.000000	Continental

----------500 ML OF WATER ----------

THANK YOU