

AI assisted Lifestyle Planner

Group 9: Separatist Droid
Army

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Introduction

- Who here has dealt with weight loss and weight gain?
- Does anyone have hereditary diseases?



Problem Statement

- People have difficulties making a healthy lifestyle styled to their needs
- Existing apps don't consider a person's
 - Genetics
 - Ethnicity
 - Specific Health Goals
- People get frustrated when a generic plan does not give their expected results



Proposed Solution

- A lifestyle planner that uses AI that takes the following into consideration:
 - Diet
 - Exercise
 - Genetics
 - Demographics
 - Personal Health Goals

Objectives

- Use an AI model that creates an exercise and diet lifestyle plan.
- To create an algorithm that uses demographics and a user's genetics
- To prioritize a user's health goals while making it feasible for users.
- To analyze and learn correlations between demographics and genetics with food and calorie needs.
- To include plan adjustment options based on what the user wants.

User Dataset

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
id	age	gender	ethnicity	weight	height_inches	chronic_conditions	dietary_preferences	activity_level	health_goal	time_commitment	genetic_predispositions	sleep_hours	food_allergies	work_schedule	stress_level	blood_pressure	gym_access
2 SJE8F	33	F	black	105	78	None	Gluten-Free	Active	Improve Stami	1 Obesity	7 Shelfish	Sedentary	Low	Normal	Yes		
3 T60LN	47	M	black	111	64	None	Vegetarian	Moderate	Muscle Gain	1 Cancer	10 None	Shift Work	Moderate	Normal	Yes		
4 FWP71	53	M	black	146	67	Hypertension	Gluten-Free	Active	Weight Loss	3 Autoimmune Diseases	8 None	Desk Job	High	Normal	No		
5 OBP4B	40	F	other	183	57	None	Keto	Moderate	Improve Stami	5 Diabetes	10 Shelfish	Desk Job	Moderate	Normal	No		
6 ORTBG	58	M	hispanic	173	71	None	Vegetarian	Active	Improve Stami	3 Cancer	6 Peanuts	Sedentary	Low	Normal	Yes		
7 F96HG	18	M	black	229	72	None	None	Moderate	Improve Stami	1 Diabetes	10 Dairy	Manual Labor	Moderate	High	Yes		
8 5CUVA	22	F	white	216	64	None	Vegetarian	Very Active	Improve Stami	1 Heart Disease	4 Gluten	Sedentary	Low	Normal	No		
9 CT7JE	39	M	asian	149	74	Hypertension	None	Active	General Fitnes	5 Obesity	7 Peanuts	Manual Labor	High	Low	Yes		
10 NZASH	58	F	black	154	61	Arthritis	Keto	Low	General Fitnes	5 Neurodegenerative Disease	10 None	Desk Job	Moderate	Normal	Yes		
11 KPP2V	20	F	hispanic	204	56	None	Vegetarian	Active	General Fitnes	2 Neurodegenerative Disease	4 None	Desk Job	Moderate	Normal	No		
12 002DR	38	F	white	190	73	Diabetes	None	Moderate	Weight Loss	3 Autoimmune Diseases	5 Peanuts	Sedentary	High	High	No		
13 2POYL	57	M	asian	172	64	Hypertension	Gluten-Free	Active	General Fitnes	5 Obesity	7 None	Desk Job	Moderate	Normal	No		
14 M669J	21	M	black	226	61	None	Vegetarian	Active	Weight Loss	4 Diabetes	4 Gluten	Shift Work	High	High	Yes		
15 HSZL2	27	F	hispanic	188	58	None	Gluten-Free	Very Active	General Fitnes	3 Obesity	4 Gluten	Manual Labor	Moderate	High	Yes		
16 TNJGL	49	M	black	214	74	Diabetes	Vegetarian	Active	Muscle Gain	5 Diabetes	7 None	Sedentary	Moderate	Normal	No		
17 F2CSA	46	F	asian	179	76	Diabetes	Vegetarian	Low	Improve Stami	3 Diabetes	8 None	Desk Job	High	High	No		
18 74HJKW	31	M	black	225	78	Thyroid conditions	None	Low	Muscle Gain	1 Autoimmune Diseases	4 Shelfish	Sedentary	Low	Low	Yes		
19 VOW76	23	M	asian	150	78	Chronic Respiratory Di	Gluten-Free	Moderate	General Fitnes	4 Neurodegenerative Disease	4 Gluten	Manual Labor	Moderate	High	Yes		
20 JEHO4	50	M	black	188	68	Hypertension	Gluten-Free	Moderate	Muscle Gain	2 Cancer	6 Dairy	Desk Job	Moderate	Normal	No		
21 FC06I	40	M	black	201	57	Diabetes	Gluten-Free	Low	Muscle Gain	1 Autoimmune Diseases	6 Shelfish	Sedentary	Moderate	Normal	Yes		
22 OT80Z	27	F	asian	244	67	Chronic Respiratory Di	Keto	Moderate	General Fitnes	3 Neurodegenerative Disease	5 Peanuts	Desk Job	High	Low	No		
23 9K9N	58	F	black	107	60	Hypertension	Vegetarian	Moderate	Improve Stami	4 Obesity	5 Shelfish	Desk Job	High	Low	Yes		
24 W747I	56	M	hispanic	136	65	Arthritis	Gluten-Free	Active	Muscle Gain	5 Obesity	8 None	Desk Job	Moderate	High	No		
25 BHVH9	54	M	white	237	72	Arthritis	Vegetarian	Active	General Fitnes	3 Neurodegenerative Disease	5 None	Sedentary	Low	High	No		
26 WY2EM	36	M	white	217	55	Diabetes	None	Moderate	Weight Loss	4 Neurodegenerative Disease	8 Peanuts	Desk Job	Low	High	No		
27 OG07P	39	M	hispanic	116	61	Diabetes	Keto	Moderate	General Fitnes	5 Obesity	6 Gluten	Desk Job	High	Low	No		
28 067ET	52	F	other	145	76	Hypertension	None	Moderate	Weight Loss	2 Diabetes	7 None	Manual Labor	Low	Low	Yes		
29 FGABR	53	M	white	128	72	None	None	Low	Muscle Gain	4 Autoimmune Diseases	10 None	Manual Labor	Low	Low	Yes		
30 CFOGV	50	F	hispanic	232	78	None	Gluten-Free	Moderate	Muscle Gain	5 Neurodegenerative Disease	6 Shelfish	Shift Work	Moderate	Low	Yes		
31 5CSYF	45	F	other	158	60	None	Vegan	Moderate	Weight Loss	3 Obesity	7 Shelfish	Sedentary	Moderate	Normal	No		
32 L9JVH	34	M	black	194	72	None	None	Low	Muscle Gain	5 Autoimmune Diseases	8 Shelfish	Sedentary	Low	High	Yes		
33 CYTPH	57	F	black	250	67	Arthritis	None	Low	Weight Loss	1 Neurodegenerative Disease	5 None	Desk Job	High	Low	Yes		
34 LUAEU	38	F	other	214	61	Hypertension	Vegetarian	Moderate	Improve Stami	4 None	8 Peanuts	Manual Labor	Moderate	Low	No		
35 I2017	35	F	other	165	69	Chronic Respiratory Di	Vegetarian	Low	Improve Stami	1 Cancer	6 Shelfish	Manual Labor	Moderate	High	Yes		
36 EEGFP	37	M	other	138	55	Diabetes	Vegan	Moderate	General Fitnes	4 Diabetes	8 Shelfish	Desk Job	Moderate	High	Yes		
37 4MXOT	36	F	asian	247	58	Diabetes	Vegan	Moderate	Muscle Gain	3 Neurodegenerative Disease	10 Gluten	Sedentary	High	High	Yes		

Food Nutrition Dataset

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
	name	serving_size	calories(kcal)	total_fat	saturated_fat	cholesterol	sodium	protein	carbohydrate	fiber	sugars	vegan	vegetarian	gluten_free	keto
1	Eggplant, raw	100	25	0.2	0	0	0	0.98	5.88	3	3.53	No	Yes	Yes	Yes
2	Cauliflower, raw	100	25	0.3	0.1	0	0	1.92	4.97	2	1.91	Yes	Yes	Yes	Yes
3	Taro leaves, raw	100	42	0.7	0.2	0	0	4.98	6.7	3.7	3.01	Yes	Yes	Yes	Yes
4	Lamb, raw, ground	100	282	23	10	73	0	16.56	0	0	0	No	No	Yes	Yes
5	Goji berries, dried	100	349	0.4	0	0	0	14.26	77.06	13	45.61	Yes	Yes	Yes	No
6	Quail, raw, meat only	100	134	4.5	1.3	70	0	21.76	0	0	0	No	No	Yes	Yes
7	Peppers, raw, jalapeno	100	29	0.4	0.1	0	0	0.91	6.5	2.8	4.12	Yes	Yes	Yes	Yes
8	Winged bean tuber, raw	100	148	0.9	0.2	0	0	11.6	28.1	0	0	Yes	Yes	Yes	No
9	Grapes, raw, muscadine	100	57	0.5	0	0	0	0.81	13.93	3.9	0	Yes	Yes	Yes	No
10	Nuts, raw, ginkgo nuts	100	182	1.7	0.3	0	0	4.32	37.6	0	0	Yes	Yes	Yes	No
11	Ostrich, raw, top loin	100	119	3	1.2	75	0	21.67	0	0	0	No	No	Yes	Yes
12	Nuts, dried, pine nuts	100	673	68	4.9	0	0	13.69	13.08	3.7	3.59	Yes	Yes	Yes	No
13	Broccoli, raw, chinese	100	30	0.8	0.1	0	0	1.2	4.67	2.6	0.88	Yes	Yes	Yes	Yes
14	Agave, raw (Southwest)	100	68	0.2	0	0	0	0.52	16.23	6.6	2.58	Yes	Yes	Yes	No
15	Emu, raw, outside drum	100	103	0.5	0.1	78	0	23.08	0	0	0	Yes	Yes	Yes	Yes
16	Nuts, dried, beechnuts	100	576	50	5.7	0	0	6.2	33.5	0	0	Yes	Yes	Yes	No
17	Currents, dried, zante	100	283	0.3	0	0	0	4.08	74.08	6.8	67.28	Yes	Yes	Yes	No
18	Lentils, raw, sprouted	100	106	0.6	0.1	0	0	8.96	22.14	0	0	Yes	Yes	Yes	No
19	Fish, raw, sheepshead	100	108	2.4	0.6	50	0	20.21	0	0	0	No	No	Yes	Yes
20	Brussels sprouts, raw	100	43	0.3	0.1	0	0	3.38	8.95	3.8	2.2	Yes	Yes	Yes	Yes
21	Chicory, raw, witloof	100	17	0.1	0	0	0	0.9	4	3.1	0	Yes	Yes	Yes	Yes
22	Broccoli, raw, leaves	100	28	0.4	0.1	0	0	2.98	5.06	2.3	1.48	Yes	Yes	Yes	Yes

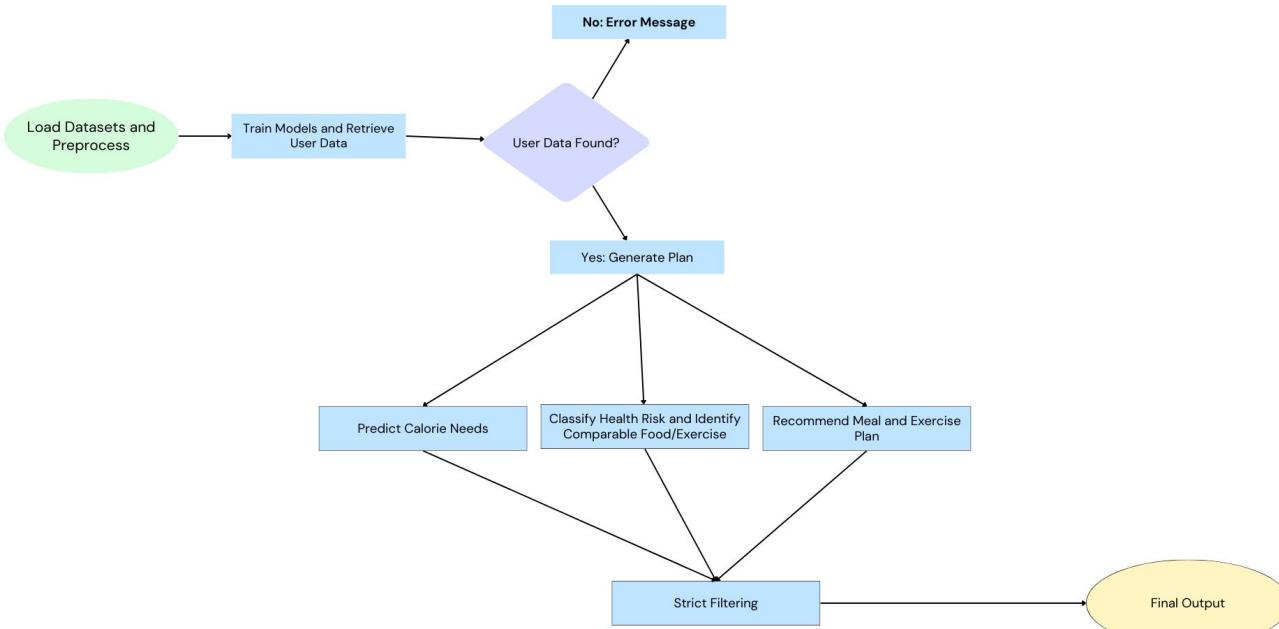
Exercise and Demographic Datasets

A	B
Activity	Calories per kg
Cycling, mountain bike, bmx	1.750729719
Cycling, <10 mph, leisure bicycling	0.82323563
Cycling, >20 mph, racing	3.294973528
Cycling, 10-11.9 mph, light	1.234853445
Cycling, 12-13.9 mph, moderate	1.647825266
Cycling, 14-15.9 mph, vigorous	2.059443081
Cycling, 16-19 mph, very fast, racing	2.471060896
Unicycling	1.02972154
Stationary cycling, very light	0.617426722
Stationary cycling, light	1.132625994
Stationary cycling, moderate	1.441339355
Stationary cycling, vigorous	2.162347534
Stationary cycling, very vigorous	2.574642352
Calisthenics, vigorous, pushups, situps	1.647825266
Calisthenics, light	0.721008179
Circuit training, minimal rest	1.647825266
Weight lifting, body building, vigorous	1.234853445
Weight lifting, light workout	0.617426722
Health club exercise	1.132625994
Stair machine	1.85295717
Rowing machine, light	0.721008179
Rowing machine, moderate	1.441339355

TABLE 8-1 Health Status Measures in Racial/Ethnic Groups in the United States.

Cause of Death	Age-Adjusted Death Rates*			
	White	Black	Hispanic	Asian
All causes	450.4	690.9	432.8	264.6
Heart disease	121.9	183.3	84.2	67.4
Coronary heart disease	79.2	92.5	54.7	42.9
Stroke	23.3	41.4	19.0	22.7
Cancer	121.0	161.2	76.1	74.8
COPD	21.9	17.7	8.5	7.4
Pneumonia/influenza	12.7	17.4	9.8	10.3
Liver disease/cirrhosis	7.1	8.0	11.7	2.4
Diabetes mellitus	12.0	28.8	18.4	8.7
HIV infection	2.6	20.6	6.2	0.8
External causes	46.7	68.8	44.7	24.4
Infant Mortality per 1,000	6.0	13.6	5.8	5.5
Life expectancy (years from birth)	77.3	71.3	>80?	>80?

Overview of our Algorithm



Results



User Ethnicity: Black
Chronic Conditions: None
Genetic_History: Obesity



Caloric Needs: 2442.81 kcal (adjusted for user's weight, activity level, and goal).

Risk Level: Low (based on genetic predispositions and chronic conditions).

Meals:

Option 1: Winged beans, raw, immature seeds (49 kcal, vegan: Yes, gluten-free: Yes, keto: Yes).

Option 2: Chicken, raw, all classes, gizzard (94 kcal, vegan: No, gluten-free: Yes, keto: Yes).

Option 3: Lamb, raw, tongue - swiss cut, imported, New Zealand (225 kcal, vegan: No, gluten-free: Yes, keto: Yes).

Exercises:

Option 1: Pushing stroller or walking with children (calories per kg: 0.52).

Option 2: Paddle boat (calories per kg: 0.82).

Option 3: Walking 2.5 mph (calories per kg: 0.62).

User Ethnicity: Asian
Chronic Conditions: Hypertension
Genetic_History: Obesity

➡ Caloric Needs: 2785.12 kcal (adjusted for user's weight, activity level, and goal).

Risk Level: Moderate (based on genetic predispositions and chronic conditions).

Meals:

Option 1: Spearmint, dried (285 kcal, vegan: Yes, gluten-free: Yes, keto: No).

Option 2: Chicken, raw, meat and skin and giblets and neck, roasting (213 kcal, vegan: No, gluten-free: Yes, keto: Yes).

Option 3: Egg, glucose reduced, stabilized, powder, dried, white (376 kcal, vegan: No, gluten-free: Yes, keto: Yes).

Exercises:

Option 1: Ballroom dancing, fast (calories per kg: 1.13).

Option 2: Rowing machine, light (calories per kg: 0.72).

Option 3: Basketball, officiating (calories per kg: 1.44).

User Ethnicity : White

Chronic Conditions: Hypertension

Genetic_History : Heart Disease

Caloric Needs: 2939.84 kcal (adjusted for user's weight, activity level, and goal).

Risk Level: High (based on genetic predispositions and chronic conditions).

Meals:

Option 1: Squash, raw, acorn, winter (40 kcal, vegan: Yes, gluten-free: Yes, keto: No).

Option 2: Fish, raw (Alaska Native), coho (silver), salmon (140 kcal, vegan: No, gluten-free: Yes, keto: Yes).

Option 3: Limes, raw (30 kcal, vegan: Yes, gluten-free: Yes, keto: No).

Exercises:

Option 1: Shuffleboard, lawn bowling (calories per kg: 0.62).

Option 2: Skateboarding (calories per kg: 1.03).

Option 3: Children's games, hopscotch, dodgeball (calories per kg: 1.03).

Algorithm description

Random Forest Regressor

- **What it does:** Combines multiple decision trees that work on random subsets of data to make robust predictions by averaging their outputs for regression tasks.
- **Why it is used:** Reduces overfitting and improves accuracy by observing randomness in data and features.
- **Advantages:** Handles higher dimensional data and able to navigate complex relationships.

generate nutrition Needs by Predicting calorie intake and macronutrient distribution (protein, fat, carbs) based on user profile.

Input: Age, weight, gender, activity level, dietary preferences.

Output: Personalized nutritional needs (e.g., 2000 calories/day).

Algorithm description

Gradient Boosting Classifier

- **What it does:** Builds a set of decision trees sequentially, where each tree corrects the errors of the previous ones, optimizing predictions for classification tasks by minimizing loss function using gradient descent.
- **Why used:** Effective for complex, non-linear classification problems
- **Advantages:** Can model complex relationships, provides feature importance, and prevents overfitting

Identify Compatible Foods/Exercises. Identify compatible foods or activities while accounting for allergies or preferences.

Input: Allergies, food dataset, activity dataset.

Output: Filtered recommendations (e.g., "Avoid dairy-based products" or "Yoga is suitable for low activity levels").

Algorithm description

Decision Tree Classifier

- **What it does:** Creates a tree-like structure that splits data based on feature thresholds to classify target variables.
- **Why used:** Easy to interpret and visualize, making it useful for decision-making.
- **Advantages:** Simple, interpretable, works with both numerical and categorical data, and captures non-linear relationships.

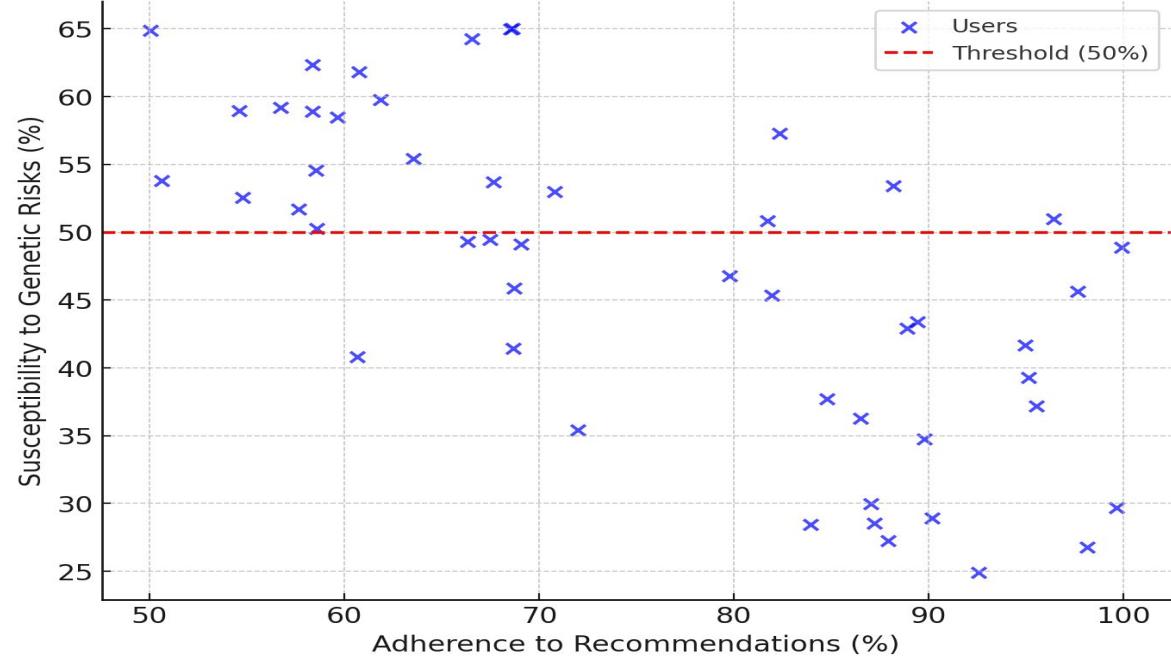
Generate Goal-Specific Plans. Generate specific recommendations for weight loss, muscle gain, or maintenance.

Input: Goals, exercise dataset, food dataset.

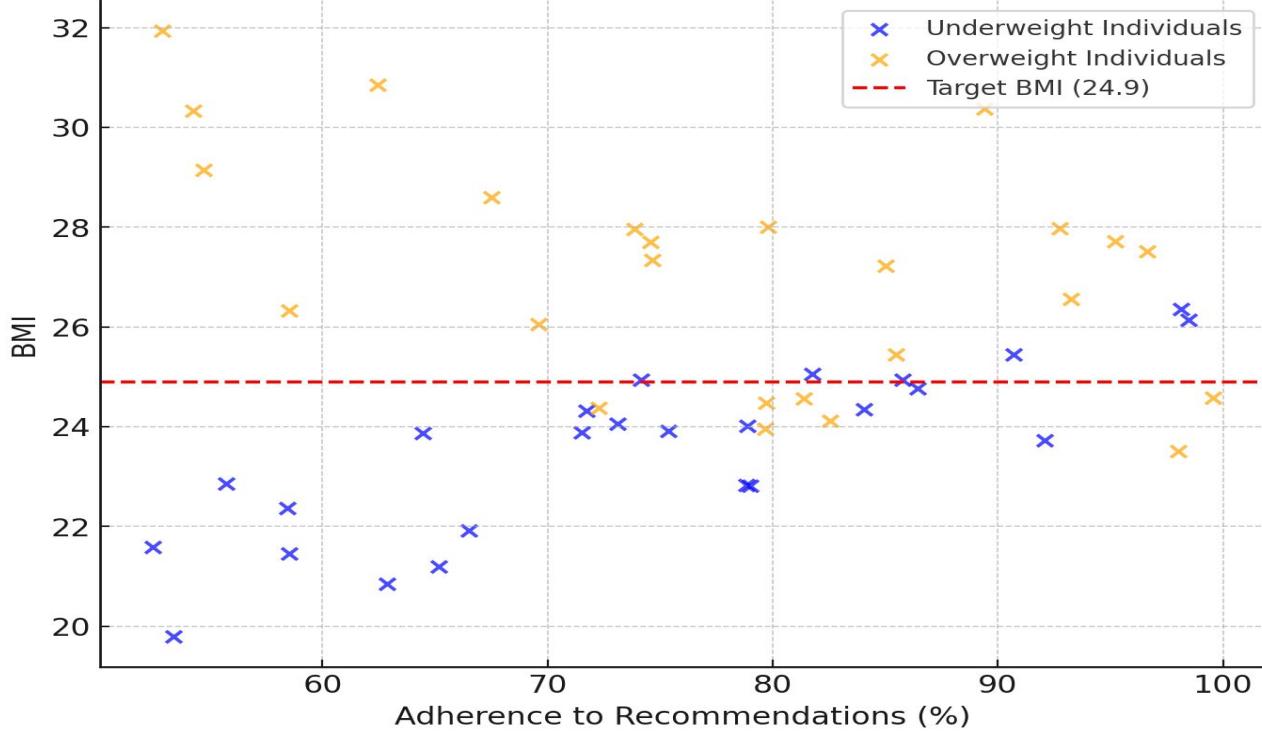
Output: Tailored plans (e.g., "Low-carb diet with strength training for weight loss").

Data Analysis

Susceptibility to Genetic Predispositions with Adherence (Multiple Users)



BMI Improvement with Adherence (Underweight vs Overweight)



Future Work

- Make A User Interface
- Real time progress tracking
- Using larger amounts of data
- Collaboration with healthcare providers
- Predicting health issues in the future.





Thank you!
Any Questions?