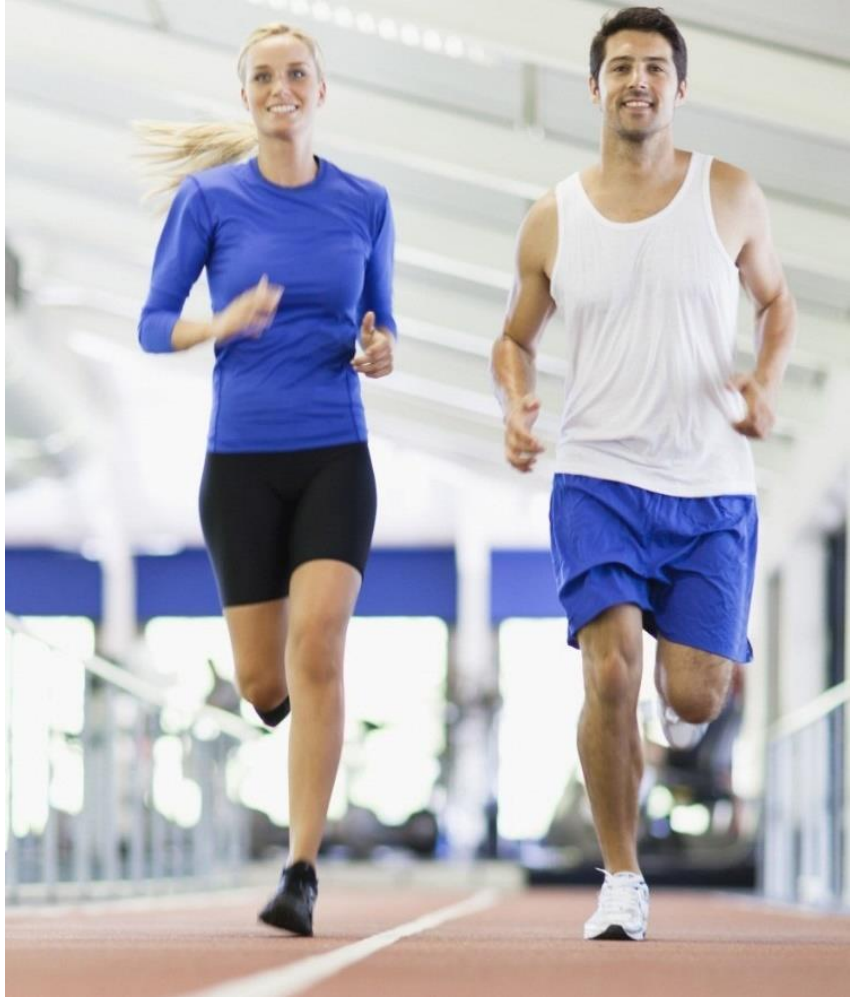


LIFESTYLE AND OBESITY

BY SAM LIM

BUSINESS PROBLEM

- Due to the pandemic, people's general lifestyles have changed
- As people are urged to stay indoors, their activity levels have decreased
- Decline in physical activity can lead to overweightness or obesity
- Goal is to see what factors contribute the most to people's obesity levels

DATA MODELING

- By looking into variables such as family history of obesity, eating habits, and lifestyle habits are taken into account to predict a person's obesity level.
- Another aspect that the study considers is a person's age, weight, height, and gender.
- A person's obesity level is categorized into: underweight, normal weight, overweight 1 and 2, and obese level of 1, 2, and 3; for a total of 7 categories.

WHAT DO THE VARIABLES REPRESENT

- Veggies: on a regular basis, how much does the individual consume vegetables
  - 1) Never
  - 2) Sometimes
  - 3) Always
- H20: how much water the individual drinks on a daily basis
  - 1) Less than a liter
  - 2) Between a liter and 2 liters
  - 3) More than 2 liters
- Physical Activity: on a weekly basis, how many days the individual spends doing physical activities
  - 0) None
  - 1) 1-2 days
  - 2) 2-4 days
  - 3) 4-5 days

WHAT DO THE VARIABLES REPRESENT (CONT)

- Time on Devices: how much a person spends time on a digital device including phones, laptops, and tablets
  - 0) Less than 1 hour
  - 1) Less than 2hours
  - 2) 3-5 hours
  - 3) more than 5 hours

WHAT ARE THE IMPORTANT FACTORS?

COMPARING INSUFFICIENT WEIGHT TO NORMAL WEIGHT

(Age	1.794043e-03
Height	5.945112e+06
Weight	3.990766e-25
Gender_Male	1.180662e+00
Family_Obesity_History_yes	2.951401e-01
Frequent_HighCalorie_Food_yes	8.216462e-01
Veggies_2.0	3.772584e+00
Veggies_3.0	2.506313e+00
Num_of_Meals_2.0	3.960318e+00
Num_of_Meals_3.0	8.742604e-01
Num_of_Meals_4.0	3.787091e+00
Food_btw_Meals_Frequently	1.338231e+01
Food_btw_Meals_Sometimes	3.309225e+00
Food_btw_Meals_no	2.718924e+00
Smoke_yes	7.968688e-01
H2O_2.0	7.954009e-01
H2O_3.0	6.941795e-01
Calorie_Monitor_yes	1.747108e+00
Physical_Activity_1.0	9.519618e-01
Physical_Activity_2.0	3.167918e+00
Physical_Activity_3.0	2.875191e+00
Time_On_Devices_1.0	1.000652e+00
Time_On_Devices_2.0	1.926667e+00
Alcohol_Consump_Sometimes	5.016032e+00
Alcohol_Consump_no	9.894306e+00
Transportation_Bike	1.165243e-01
Transportation_Motorbike	1.882456e-01
Transportation_Public_Transportation	6.622255e-01
Transportation_Walking	1.636883e+00
intercept	6.044775e+02
dtype: float64,	

- Shows how increasing each variable will increase the odds of a person being a normal weight rather than having insufficient weight.

WHAT ARE THE IMPORTANT FACTORS?(CONT)

- Compared to the previous chart, we can see that most factors' "weights" have increased.

- Comparing Overweight II to obesity type i

Age	82.232588
Height	0.626380
Weight	0.396999
Gender_Male	4.359646
Family_Obesity_History_yes	2.859744
Frequent_HighCalorie_Food_yes	0.201582
Veggies_2.0	2.285436
Veggies_3.0	0.382303
Num_of_Meals_2.0	4.269938
Num_of_Meals_3.0	0.613421
Num_of_Meals_4.0	0.470341
Food_btw_Meals_Frequently	5.970866
Food_btw_Meals_Sometimes	9.232449
Food_btw_Meals_no	0.154115
Smoke_yes	3.095271
H2O_2.0	1.475987
H2O_3.0	1.117910
Calorie_Monitor_yes	1.488295
Physical_Activity_1.0	1.675043
Physical_Activity_2.0	0.701496
Physical_Activity_3.0	1.982988
Time_On_Devices_1.0	2.208853
Time_On_Devices_2.0	2.807893
Alcohol_Consump_Sometimes	0.455835
Alcohol_Consump_no	2.025970
Transportation_Bike	0.149388
Transportation_Motorbike	3.397257
Transportation_Public_Transportation	0.993561
Transportation_Walking	1.204572
intercept	604.477505

dtype: float64,

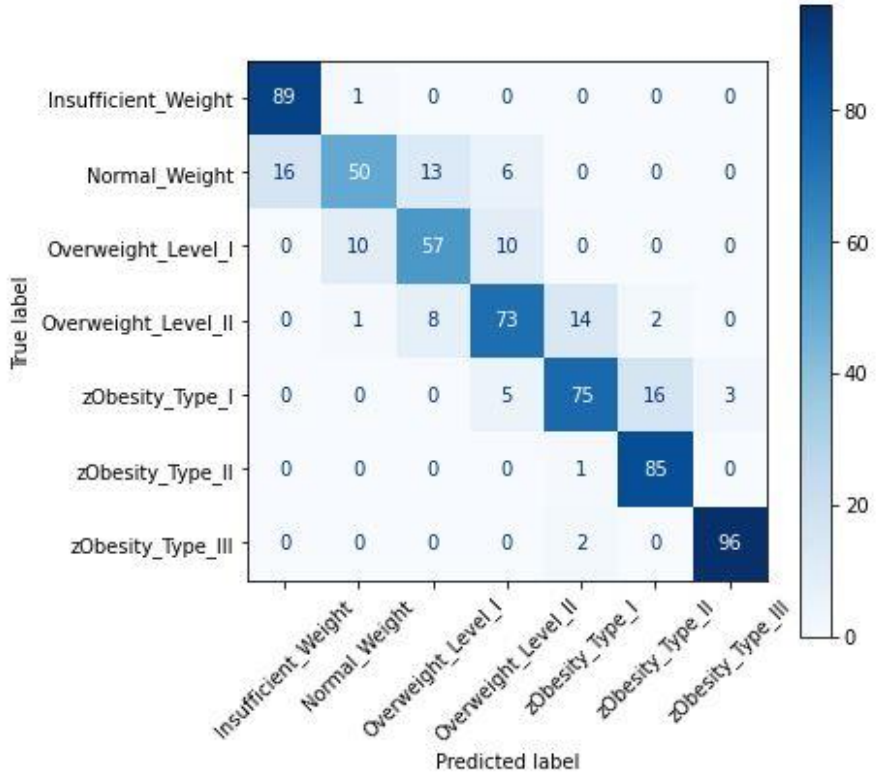
K-NEAREST-NEIGHBORS

- These figures show how accurate/precise our model is when predicting the obesity level.
- 0 means underweight; 1 is normal; 2 and 3 are overweight I and II; and 4, 5, 6 represent obese level of I, II, and III respectively.
- Precision is much higher towards the ends of the spectrum.

	precision	recall	f1-score	support
0	0.80	0.88	0.84	90
1	0.63	0.47	0.54	85
2	0.70	0.75	0.73	77
3	0.80	0.80	0.80	98
4	0.87	0.89	0.88	99
5	0.90	0.95	0.93	86
6	0.99	1.00	0.99	98
accuracy			0.83	633
macro avg	0.81	0.82	0.81	633
weighted avg	0.82	0.83	0.82	633

CONFUSION MATRIX

- Shows what the model predicted a person's obesity level is compared to the actual data.
- Again, shows that prediction gets lower as we approach normal weight range.



RECOMMENDATIONS

- Hydration , transportation, vegetable consumption, the number of meals, and food between meals were the most effective in reducing obesity levels.
- However, when comparing different obesity levels to one another, the degree to which the independent variables affected a person's weight level were sometimes drastically different.
- From our data, we can conclude that while much of the habits that we view as healthy do benefit us, it is not the perfect determinant in measuring obesity levels.

CONCLUSION AND NOTES FOR FUTURE RESEARCH

- By better separating the data to represent each obesity level, I believe I would be able to have a better representation of how each variables affect a person's weight.
- Doing so will also help in determining the accuracy of the predictions with the confusion matrix.

THANK YOU

Q&A