Exploring Factors that Shape Mental Health

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Dataset Descriptions

Sleep and Health Lifestyle

- Sleep duration and quality
- Stress, 0-10 scale
- Physical health data (BMI, Heart Rate, etc.)
- Sleep Disorder (None, Sleep Apnea, Insomnia)

Mental Health in Tech

- Demographic info
- Has employee sought treatment for mental health?
- Questions about employers' attitude towards mental health

Music and Mental Health

- User's listening habits
- Self-reported mental health conditions, 0-10 scale (Depression, Anxiety, Insomnia, OCD)
- How often user listens to specific genre

Analysis 1: KNN Classifier

Analytical Questions

1. Can we classify a person’s sleeping disorder status based on sleep quality and lifestyle predictors?

2. Which of these predictors is best at classifying?

Sleep Health and Lifestyle Dataset

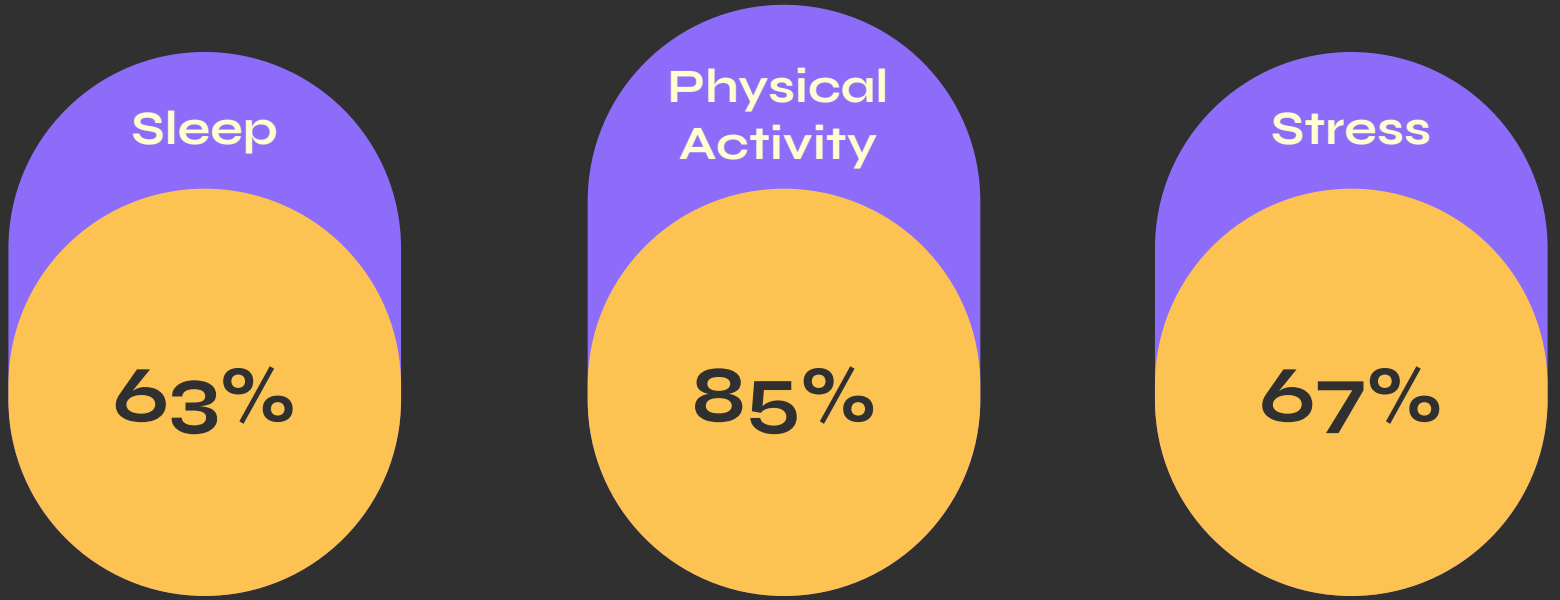
1. Model 1: Sleep
2. Model 2: Physical Activity
3. Model 3: Stress

Model 1: Sleep	
Predictors	Accuracy
Sleep Duration Quality of Sleep	63%

Model 2: Physical Activity	
Predictors	Accuracy
Physical Activity Level BMI Category Blood Pressure Heart Rate Daily Steps	85%

Model 3: Stress	
Predictors	Accuracy
Stress Level	67%

Takeaways



Classifying Sleep Disorder: (Sleep Apnea, Insomnia or None)

Analysis 2: K-Means Clustering

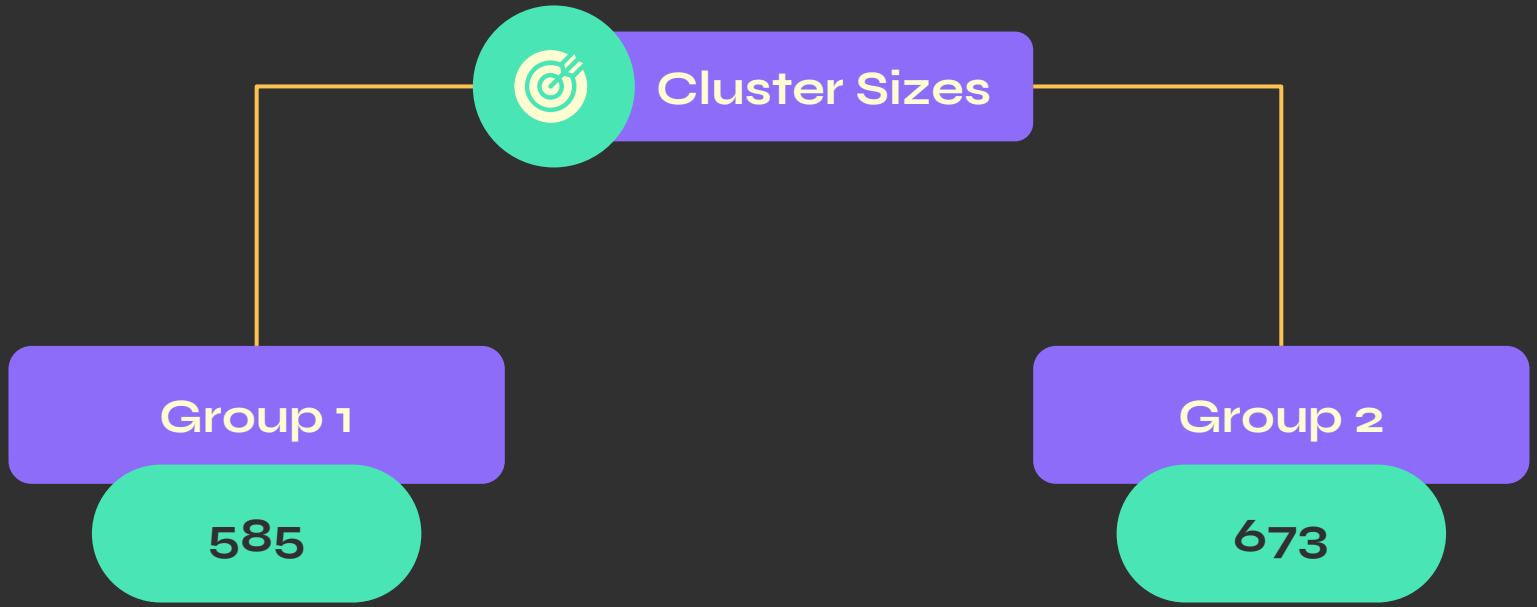
Analytical Questions

1. How can different tech workers be grouped together based on their responses to the mental health survey?

2. What do these two groups represent?

Mental Health in Tech Dataset

1. ***K Means Clustering***
2. Hierarchical Clustering
3. DBScan Clustering


Cluster Sizes
Group 1
585
Group 2
673

Cluster Means		
Variable	Age	Sought Treatment
Group 1	25.9	47.2%
Group 2	37.18	52.8%

Takeaways

- K Means performed best
- None of the Clustering Algorithms separated users by whether they sought treatment as well as desired
- Clusters provide very little evidence of association between age and likelihood to seek treatment

Analysis 3: Frequent Itemsets and Association Rules

Analytical Questions

1. What are frequent combinations of music preferences?

2. Are certain mental health disorders associated with listening tendencies?

Music and Mental Health Dataset

- How frequently does the user listen to each genre? (0 if ‘Never’ or ‘Rarely,’ 1 if ‘Sometimes’ or ‘Very Frequently’)
- Self-reported severity of mental health condition (0 if 0-6, 1 if 7-10)
- Treating observations as market baskets to find:
  - Frequent combinations of genres (Min. Support = 0.15)
  - Association Rules (Mental Health Condition => Music Genre, Min. Confidence = 0.4)

Frequent Itemsets

*Sample of 5 out of 70 discovered

Itemset	Support
Rock, Rap, Hip Hop, Pop	0.224
Rock, Rap, Hip Hop, R&B	0.171
Rock, R&B, Pop	0.225
Rock, Video Game Music, Pop	0.25
Hip Hop, R&B, Pop	0.257

Association Rules

Mental Health Condition	Music Genre	Confidence
Anxiety	Jazz	0.5
Anxiety	EDM	0.489
Depression	Metal	0.414

Takeaways

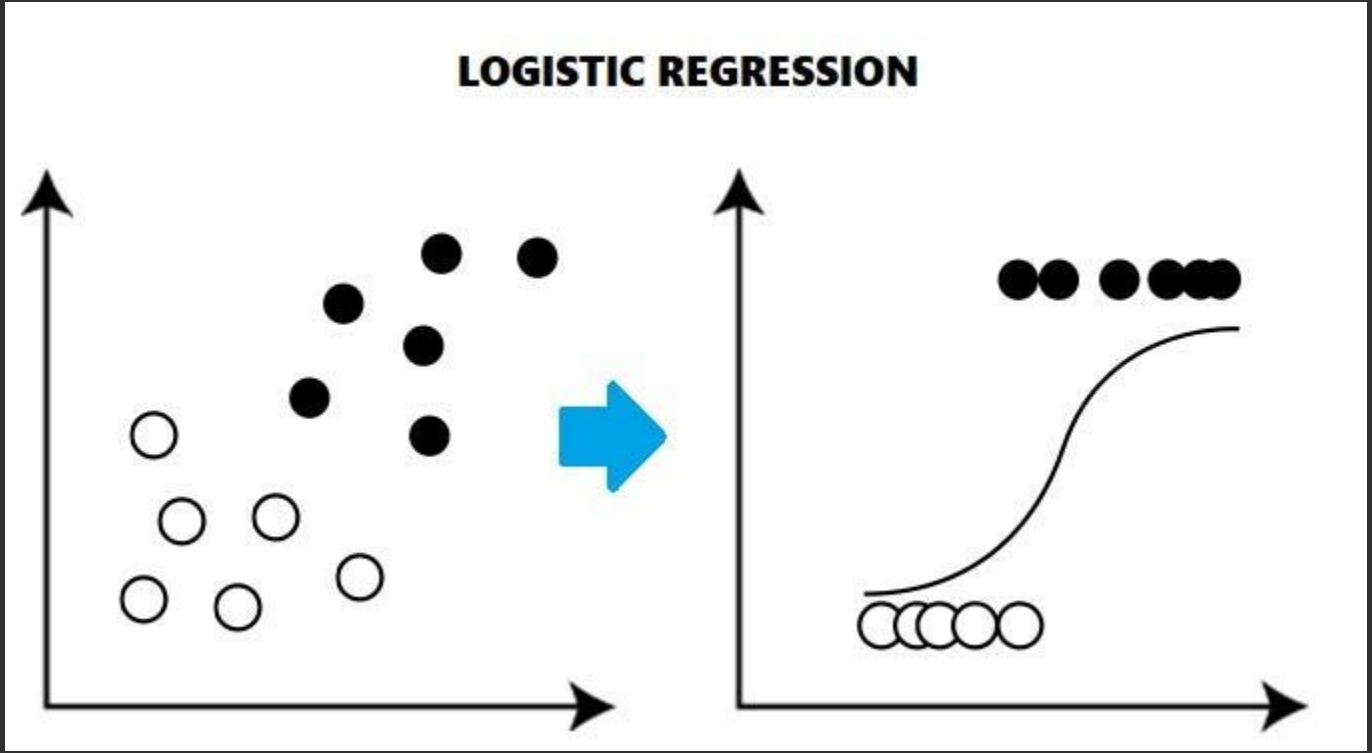
- Rock and pop appear to be very popular genres among listeners in the data
- Association rules tell us common listening habits of those with specified mental health condition, but do not imply causation
- Could be indicative of genres helping users improve mental health status
- Logistic Regression explores this

Analysis 4: Logistic Regression

Analytical Questions

1. Can we predict whether music improves mental health based on listening habits?

Logistic Regression



Results

Accuracy: 77%

Variables	Coefficients
Hours per day	0.21
While working	- 0.03
Instrumentalist	0.29
Composer	0.21
Exploratory	0.58
Foreign Language	- 0.14
BPM	- 0.17

Takeaways

Exploratory
0.58

Respondents who actively explore new artists and genres are more likely to use music to improve mental health

Foreign Language
-0.14

Respondents who regularly listen to music in language's they are not fluent in are less likely to use music to improve mental health

Instrumentalist
0.29

Respondents who play an instrument regularly are more likely to use music to improve mental health

THANK YOU