Group 6

Counting Sleep Disturbances

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Original Project Goal: to inform a user of their sleep quality as impacted by various sleep positions.

For example: discovering that a user slept the longest undisturbed while laying on their back.

Project Goal Change:

```
~~~~~~~~~~~~~~ AVERAGES ~~~~~~~~~~~~~~
average_accuracy = 0.5652546232370653
For legs moving: average_precision = 0.46085995135858404
For legs moving: average_recall = 0.4714195640142543
For minimal movement: average_precision = 0.45739736874647496
For minimal movement: average_recall = 0.5450405578366317
For posture change: average_precision = 0.7137609378965684
For posture change: average_recall = 0.6227622026782382
(base) dishasrivastava@1x-nat-vl930-172-30-97-77 sensing-sleep-quality %
```

Original problem: low accuracy in classification model. Spoke with TA who recommended gathering longer data samples.

Result: longer data samples result in receiving 100% accuracy in the model, or extreme overfitting of data.

```
~~~~~~~~~~~~~ START FOLD ~~~~~~~~~~~~~
[[3581    0]
 [   0 1511]]
accuracy = 1.0
precision_little_movement = 1.0
recall_little_movement = 1.0
precision_legs = 1.0
recall_legs = 1.0
~~~~~~~~~~~~~ END FOLD ~~~~~~~~~~~~~

~~~~~~~~~~~~~ START FOLD ~~~~~~~~~~~~~
[[3569    0]
 [   0 1523]]
accuracy = 1.0
precision_little_movement = 1.0
recall_little_movement = 1.0
precision_legs = 1.0
recall_legs = 1.0
~~~~~~~~~~~~~ END FOLD ~~~~~~~~~~~~~

~~~~~~~~~~~~~ START FOLD ~~~~~~~~~~~~~
[[3558    0]
 [   0 1534]]
accuracy = 1.0
precision_little_movement = 1.0
recall_little_movement = 1.0
precision_legs = 1.0
recall_legs = 1.0
~~~~~~~~~~~~~ END FOLD ~~~~~~~~~~~~~

~~~~~~~~~~~~~ START FOLD ~~~~~~~~~~~~~
[[3594    0]
 [   0 1497]]
accuracy = 1.0
precision_little_movement = 1.0
recall_little_movement = 1.0
precision_legs = 1.0
recall_legs = 1.0
~~~~~~~~~~~~~ END FOLD ~~~~~~~~~~~~~

~~~~~~~~~~~~~ AVERAGES ~~~~~~~~~~~~~
average_accuracy = 1.0
For minimal movement: average_precision = 1.0
For minimal movement: average_recall = 1.0
For legs moving: average_precision = 1.0
For legs moving: average_recall = 1.0
(base) igebrewolde@Isaacs-MacBook-Pro sensing-sleep-quality %
```

Revised Project Goal: to inform a user of their number of sleep disturbances during a night's sleep

For example: a user can test which methods help them sleep better (melatonin, meditation), and we can offer a supporting data point of the number of sleep disturbances to help a user make a decision on which sleep tool is actually helping them

Gathering Data (Revised)

Using our phone's accelerometer on the Sensor Log app, we recorded an interval of sleep tosses and turns (sleep disturbances):

- *3 tosses and turns*
- *15 tosses and turns*
- *45 tosses and turns*

The position of the phone was placed in the right pocket.