

E. In your PDF, show the resulting one-rule threshold classifier code.
What was your one-rule for this assignment? It is just an if-statement. (2)
(Copy and paste from your output classifier file.)

```
if speed <= threshold:
    intent = 0
else:
    intent = 2
```

F. Run your code to produce your classifier program.
Your code must produce the resulting classifier. (2)
It runs.

G. Run your resulting classifier on the supplied test suite.
Your resulting classifier must run. (2)
It runs.

Classifier:

```
import csv
import numpy as np
import pandas as pd
import sys

def classify_cars(speeds, threshold):
    below_thresh = sum(speed <= threshold for speed in speeds)
    above_thresh = sum(speed > threshold for speed in speeds)
    return below_thresh, above_thresh

def main(input_file):
    data = pd.read_csv(input_file)
    data['SPEED'] = np.floor(data['SPEED']) # truncate data
    speeds = sorted(list(data['SPEED']))
    below_thresh, above_thresh = classify_cars(speeds, 62)

    print("Cars with speed <= 62 : ", below_thresh)
    print("Cars with speed > 62 : ", above_thresh)
```

```
if __name__ == "__main__":  
    input_file = sys.argv[1]  
    main(input_file)
```

H. How many Aggressive drivers did your classifier routine find in the test suite?
Have your classifier print out the number of cars \leq the selected threshold.
Have your classifier print out the number of cars $>$ the selected threshold.
Report these numbers in your write-up. (2)

The result was:
Cars with speed ≤ 62 : 1475
Cars with speed > 62 : 525

I. Conclusion: Write up what you learned here using at least three paragraphs. (2)

What happens when we give more weight, more importance to false negatives than to true positives?

What did you discover? Were the results what you expected? What was surprising?

Was there anything particularly challenging? Did anything go wrong?

Provide strong evidence of learning.

Write a conclusion that describes what you learned in this homework.
Points are taken off for writing with bullet points or checkmarks.

When more weight is given to false negatives we minimize the number of missed detections meaning we will have fewer false negatives. However, this would most likely increase the number of false positives.

I discovered that my classifier shows the overwhelming majority of cars were under my best_threshold that minimized badness. I think this is a good thing if I'm interpreting the data correctly, and means that my best threshold number was accurate at classifying the data. This is what I was hoping for/expecting. I think I was a bit surprised that the best_threshold value wasn't lower, I had assumed from the data that there might be more non_aggressive drivers under the speed limit. But it does make sense that the best threshold value I ended up with is still in the middle.

I have never written a meta-programming piece of code so this was an interesting learning experience for me. It was challenging to deal with formatting the code and making sure it's functional since you are essentially writing it in a comment block. I ended up writing these

portions outside the comment block elsewhere in my program first to make sure the formatting was done properly.