**Note**: Please refer to the Excel Document entitled "Answers". There are two tabs inside. Test Data – Answers and Sensors –Answer which correlate to the first and second set of questions respectively.

# Test Data – Answers

1. **Which driver needs to change the way he characterizes issues?**

Ringo – According to the data, Ringo doesn't seem to ever characterize 'minor', leading us to believe that he radicalizes his severity assessment.

1. **Which road type seems to be the most challenging?**While Urban roads have the highest percentage of critical severity (28%), Country and Highways both have a higher cumulative percentage of critical and major severity (around 50%). Although Urban's cumulative percentage of critical and major severity holds at around 45% (5% less than country and highways), I would classify Urban as the most challenging overall when taking into consideration it's high levels of critical severity, as well as its overall increasing percentage from critical until medium severity.
2. **In which country do we have the worst performance?**Italy has the highest percentage of critical and major severity rates and can be definitively classified as the country with the worst performance.
3. **Which illumination has the best results?**

Dusk has the highest percentage of minor severity rates. Although its critical severity rates are higher than Day and Night, the cumulative rates for critical and major together for Dusk are lower than the same cumulative rates for Day and Night.   
Moreover, assuming the driving times were distributed evenly throughout the 24 hours, Dusk has the lowest overall rates of any kind of problematic driving.

# Sensor – Answers

1. **Which is the best sensor in terms of signal quality and why?**

I'd like to propose that sensor 3 is the sensor with the best signal quality. Although all three sensors average at ~2.47 (the real measure), series 3 has the smallest standard deviation and consistently stands at ~2.47.

1. **Which sensor is almost not useful at all and why?**  
   I'd like to propose that series 1 is not useful. Although its average indeed is ~2.47, its standard deviation is the highest of the three series and it seems that the data is randomly distributed.
2. **What is the standard deviation of each data series?**
   1. Series 1: 1.413749
   2. Series 2: 0.974244
   3. Series 3: 0.048712
3. **What is the statistical distribution that best describes each sensor output?**Note: See the histograms as well as the descriptive statistic that indicate these conclusions.
   1. Series 1: Evenly Random
   2. Series 2: Normal Distribution
   3. Series 3: Normal Distribution
4. **What is the RMS for each sensor?**
   1. Series 1: 8.122096
   2. Series 2: 7.085643
   3. Series 3: 6.246673

# Parser – Answers

Note: My calculations were done in a python script entitled 'parse\_log\_final.py' and conclusions were drawn accordingly

1. **The speed sensor has an undesired issue. Please define it**.

Every ~95 (+/-5) reads, the speed sensor gets an unexpected number (either above or below the current pattern [+/- 5]).   
This was done by parsing each line according to the given structure and calculating the speed as mentioned above. I then did a quick manual onceover to detect any abnormalities.   
I found that every ~95 reads, there speed jumps in any direction deviating from the orderly sequence. The pattern for which direction was not detected.

1. **Find the wrong FCS**

There was one wrong FCS in line 35 (in my version of parsing). This FCS switched 'M' instead of '=' (4D instead of 3D).