Chris Penno | 1519526 & Ethan McKee-Harris | 1536943

**Engen 103 Semester 20A Assignment Part two**

Please note, all of the files in our simulation were modified in some way. The modifications can be seen in brief below:

**Cars.py**\_\_str\_\_ and \_\_repr\_\_ were modified to be easier to read. Unit tests were also updated accordingly.

**Controllers.py**Moved a couple defaults. Implemented a wait time system and all of the required functions and variables required to support it.   
Implemented various cycles to fully support our concepts and planned implementations.

**Simulator.py**  
Added the ability to detect if the lights are broken and added this logic in the relevant functions.  
Modified displayControllers to work on windows.  
resetCars has a set number that we used for testing however, I did revert it.  
CountAllCars was added to complement our sensor logic.  
The timer function was rewritten as it broke any time over a few minutes and we wanted accuracy since it was crucial in our testing phase.  
Our wait time functions were implemented here to further complement the class methods and also our traffic light logic.  
We implemented two functions to allow for the usage of threading on class instances to run two traffic lights at once.  
PrintMax was used for debugging to ensure our logic is working correctly. Hint, it was :)  
Our lightSignals function was fully implemented to handle the logic described in the report from part one

Yea that’s about it for changes in this part. Test.py will be sent during submission for part three.

When comparing our code for concept 1 & 3

Concept 1 being lights just rotate through clockwise

Concept 3 being based on lane length & wait times

I found that using a set ResetCars functions (I.E. generated 25 new cars every time)

Concept 1 had a total cars count of: 210 after 5 minutes

Concept 3 had a total cars count of: 285 after 5 minutes

This means Concept 3 had 75 more cars then Concept 1 are running for the same timeframe

This means Concept 3 is 135% more efficient then Concept 1

However, after changing to a standard generation amount of 50 cars per new reset. Concept three vs concept one almost doubled in efficiency. Please view the below images for said efficiency n things.

After about 15 minutes:

<https://gyazo.com/af5abcb2338290c1ebf09df2abf8c740>

After around 1:45 hours:

<https://gyazo.com/21855562393c21bbb78a01017d38b1c6>

At this point my pc is running 24/7 to host my other software

I make for people so why not keep this going as well

After 70 hours:

<https://gyazo.com/9f60436c8d2193732e314776aa2db713>

After 101 hours:

<https://gyazo.com/30c54db8a0d55c1c71292d164166bfa1>

After 141 hours:

<https://gyazo.com/ba045e6770dafe4055560928d336ef88>