**Solution Testing**

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| What are we testing? | What should happen? | What did happen? | Did it meet expectations? | Recommendations for improvement |
| How clear are the instructions? | The instructions should be easy to read | From an outside perspective the instructions on how to load up and run the code are not easy to read | No, due to the fact that, from an outside perspective, the instructions aren’t clear on how to setup the code | The instructions should be made to be better understood by everyone, can possibly be made clearer by adding in more steps to tell the user what they should do |
| Does the code compile? | The code should compile | The code is able to fully compile in order to be ran by the user | Yes due to compiling like it should do | N/A |
| Is the code able to read the necessary file? | The code should be able to read the necessary file | The code is able to correctly read the given file | Yes due to being able to read the given file | N/A |
| What happens when there isn’t a file to load? | The code should show an error when there isn’t a file to load | The code shows an error due to not having a file to load | Yes due to giving an error when a file wasn’t supplied | This could be improved so then instead of crashing and showing an error, it could prompt the user into selecting a proper file in order for it to read it |
| How does the code react with still images of vehicles? | The code should be able to identify vehicles in still images | The code identifies the vehicles within the still images by drawing a box around the vehicle | Yes due to being able to identify the vehicles within the images | Currently the code draws one box around multiple vehicles when there are multiple ones in the image, so this could be improved by having the code draw individual boxes around each of the cars |
| What happens when it is given a different format? | The format of the images shouldn’t change the performance of the model | The format of the images doesn’t change the performance of the model | Yes due to it not affecting the performance | N/A |
| How does the code react to a video with vehicles? | The code should be able to identify the vehicles within the video | The video file couldn’t work with the code and so the vehicles couldn’t be identified | No due to the video not working with the code in order for vehicles to be identified | The code will need to be modified so then it is less reliant on processing still images so then it can process videos in order to identify vehicles before we can even think on moving onto real time evaluation |
| Does the code correctly identify the appropriate vehicles? | The code should be able to identify any vehicles within the given files | The code is able to correctly identify cars within the given file | Yes due to being able to identify the vehicles within the given file | Instead of drawing one large box around multiple vehicles it could draw multiple smaller ones |
| Does it identify the vehicles with at least 75% accuracy? | The code should be able to at least identify vehicles with a 75% accuracy | The code is able to identify the images within the files with an 85% accuracy | Yes due to being over the minimum of 75% accuracy | If more time was had there may be a way in order to increase the accuracy of the model in order to be used in industry |

These tests were done to see if someone would be able to download and then run the software for the vehicle detection program. This was done to highlight any issues they may come across and recommend improvements to make the system more robust and also easier to understand.

The first problem that I noticed was that, from an outside perspective, the instructions for the downloading and running of the software wasn’t all that clear. This can then be solved by changing the instructions to include a more in-depth guide on how to install and run the software. However, the second problem is more alarming due to the fact that the code doesn’t work with video files in order to identify vehicles. This would pose a problem if someone were to try and run a video through the model to try to detect any vehicles and then not have it work on them. So the recommendation is that we improve the system by changing the code so then it would allow for vehicles to be detected within videos.

Aside from the two issues, the model seems to run fine since the code can be compiled, read the given files (as long as they’re images) and then identify the vehicles within them. A recommendation that can be given now is that the system would be improved so then it would give a message instead of an error when no file is given. Another recommendation is that individual boxes are drawn around the vehicles when there are multiple vehicles within a single image and to find a way to increase the accuracy of the overall model.