# Assignment 2, EDL100, Victor Larsson, 230921

## A)

En bild som visar text, handskrift, Teckensnitt, linje

Automatiskt genererad beskrivning

Figure 1.WLTC Drive Cycle.

En bild som visar text, diagram, Teckensnitt, linje

Automatiskt genererad beskrivning

Figure 2.NEDC Drive Cycle.

En bild som visar text, diagram, linje, Graf

Automatiskt genererad beskrivning

Figure 3.Self-made drive cycle.

I made my own NEDC drive cycle using NEDC file from web(epa.gov). I used python to create a CSV with values in same format as WLTC\_cycle.mat. Then I modified the model file to load my new drive cycle. Copied the drive cycle load block in Simulink and modified it to accept my new variables.

I did similar thing when I created my own drive cycle. I didn’t use python this time but made a \*.mat file using your example script.

## B)

En bild som visar text, linje, Graf, skärmbild

Automatiskt genererad beskrivning

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Speed  (km/h) | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 | 110 | 120 | 130 | 140 | 150 | 160 | 170 | 180 |
| Power  (W) | 0 | 425 | 901 | 1479 | 2209 | 3141 | 4328 | 5818 | 7664 | 9916 | 12624 | 15839 | 19612 | 23994 | 29036 | 34788 | 41300 | 48624 | 56811 |

Figure 4.power requirement for example car used in assignment 1. Using traction power (Pt=Ft\*v).

I made these figure by using my file from assignment 1. Where I used MATLAB’s round() feature to round off to integers and save them in Assignment2B\_Table.mat file.

## C)

En bild som visar text, Teckensnitt, linje, diagram

Automatiskt genererad beskrivning

Figure 5. WLTC Drive cycle. With positive slope angle of 0.07 rad.

En bild som visar text, Teckensnitt, linje, diagram

Automatiskt genererad beskrivning

Figure 6.WLTC Drive cycle. With negative slope angle of -0.07 rad.

If we compare to the first example (A) we can see that we have same acceleration and speed requirements but now we have a constant slope angle (+0,07 rad (4°)). When we have a positive slope angle, we see that we need more power to maintain speed, and more so when we accelerate.

If we change the slope angle to negative 0.07 rad (-4°) we se that we need significantly less power to accelerate. And we get a bigger regeneration and/or the brakes need to dissipate more energy in order to slow down.