TDS - Temperature Calculation using temperature ADC

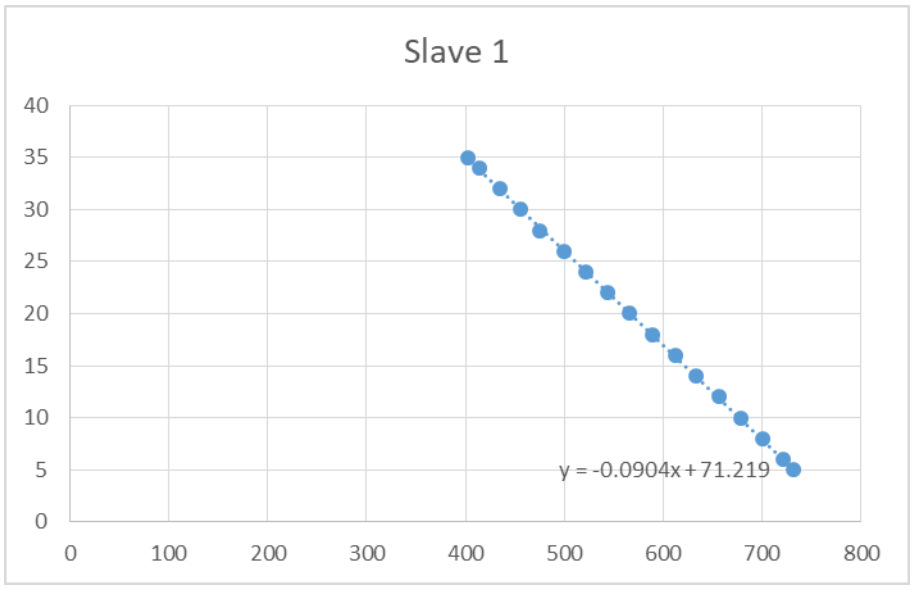
The specific temperatures has been determined based on the **ADC versus Set temperature** (Refer file ADC Vs Set Temperature.xlsx).

With respect to Linear Equation of **ADC (X) Vs Set Temperature (Y) of Slave 1**:

Y = (-0.0904 (X)) + 71.219

Y = Set temperature

X = Avg Adc



Calculating Temperature after Calibration:

Calibrated Temperature Value = (-0.0904 * (Temperature Adc)) + 71.219

Temperature Calculation For Each Slaves:

The Offset value at specific Temperatures for each Slaves has been determined based on the **Error rate versus Set temperature** (Refer file *ADC Vs Set Temperature.xlsx*)

Linear Equations of Tempeach Slaves based on :

Slave 1: y = -0.0904x + 71.219
Slave 2: y = -0.0906x + 71.686
Slave 3: y = -0.0902x + 71.038
Slave 4: y = -0.0909x + 71.862
Slave 5: y = -0.0898x + 70.741
Slave 6: y = -0.0899x + 70.99
Slave 7: y = -0.09x + 71.04
Slave 8: y = -0.0895x + 70.728
Slave 9: y = -0.0902x + 71.244
Slave 10: y = -0.0905x + 71.388
Slave 11: y = -0.0902x + 71.209
Slave 12: y = -0.0902x + 71.148
Slave 13: y = -0.0905x + 71.301
Slave 14: y = -0.0899x + 71.106
Slave 15: y = -0.0898x + 71.008
Slave 16: y = -0.0902x + 71.141
Slave 17: y = -0.0902x + 70.92
Slave 18: y = -0.0902x + 71.08
Slave 19: y = -0.0903x + 71.161
Slave 20: y = -0.0904x + 71.381
Slave 21: y = -0.0902x + 71.078
Slave 22: y = -0.0902x + 71.179
Slave 23: y = -0.0903x + 71.04
Slave 24: y = -0.0904x + 71.234
Slave 25: y = -0.0904x + 71.103

Examples:

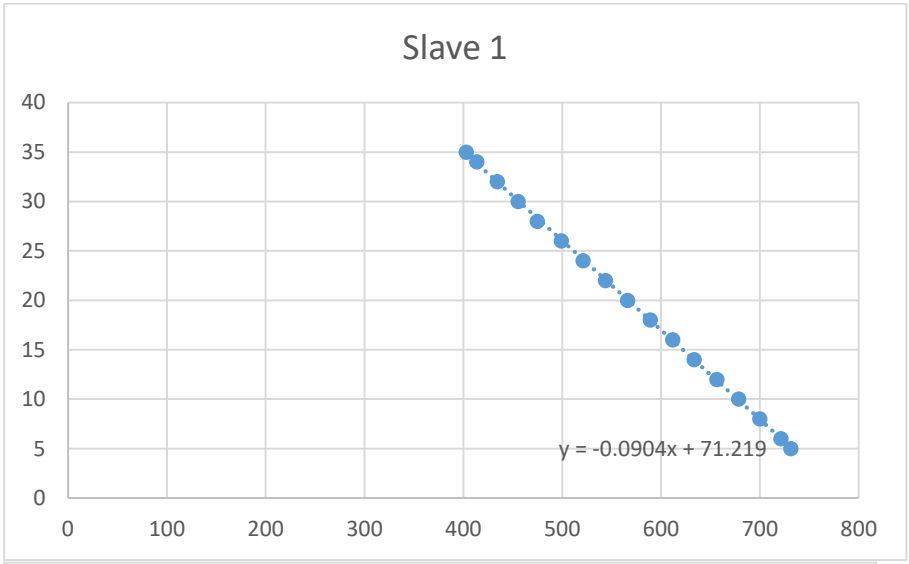
Y = Temperature
X = ADC value in mV

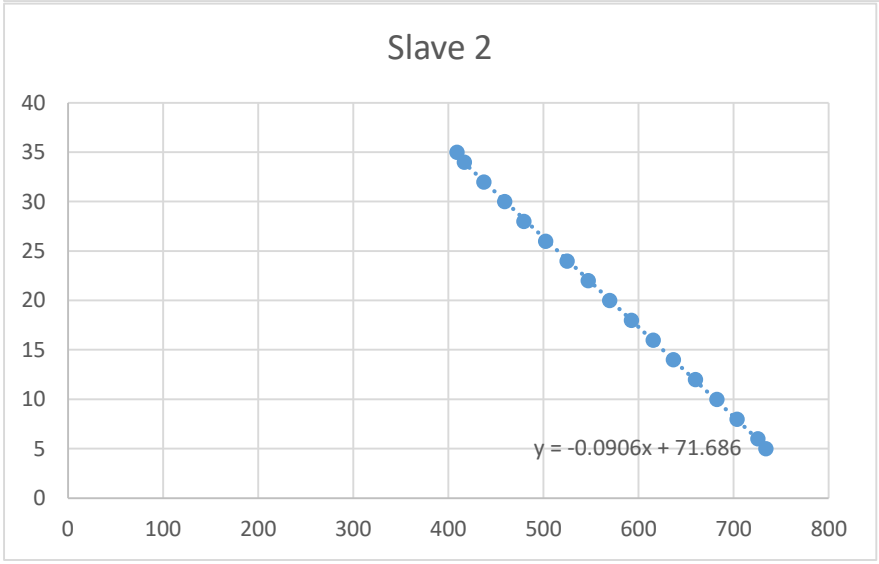
Slave 1: y = -0.0904 * 400 + 71.219 = 34.8196
Slave 2: y = -0.0906 * 500 + 71.686 = 22.686
Slave 3: y = -0.0902 * 600 + 71.038 = 16.638

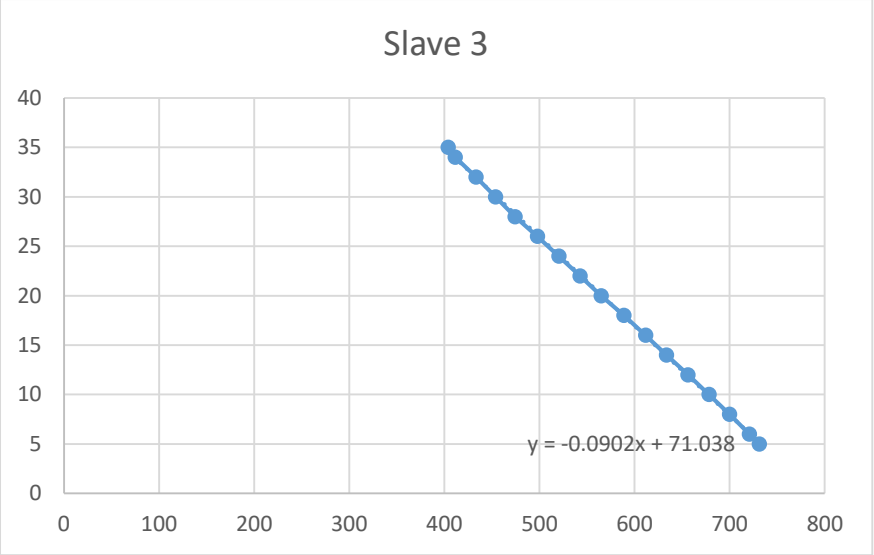
Slave 8: y = -0.0895 * 450 + 70.728 = 30.675
Slave 9: y = -0.0902 * 550 + 71.244 = 20.744
Slave 10: y = -0.0905 * 650 + 71.388 = 10.638
Slave 11: y = -0.0902 * 475 + 71.209 = 27.2894
Slave 12: y = -0.0902 * 525 + 71.148 = 23.7996
Slave 13: y = -0.0905 * 575 + 71.301 = 20.1987
Slave 14: y = -0.0899 * 625 + 71.106 = 10.7311

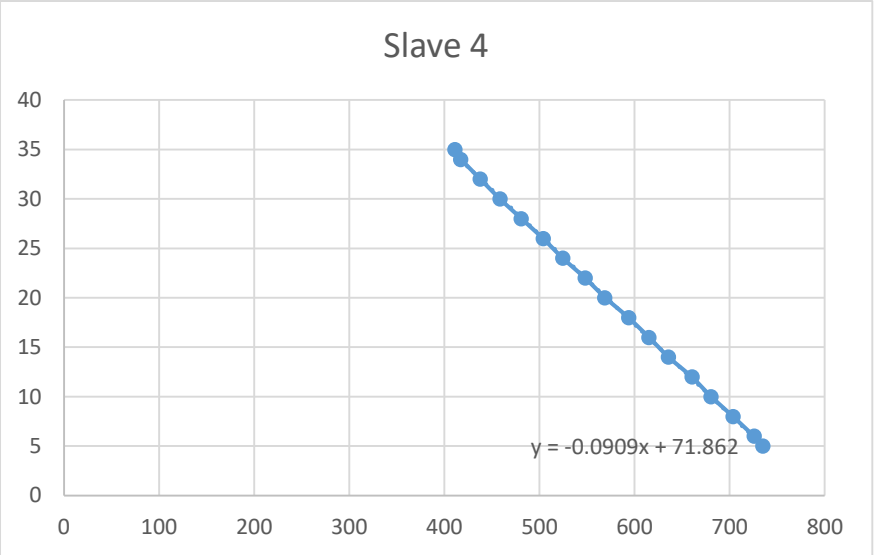
Slave 19: y = -0.0903 * 450 + 71.161 = 30.9797
Slave 20: y = -0.0904 * 500 + 71.381 = 22.7816

Slave 24: y = -0.0904 * 550 + 71.234 = 17.6144
Slave 25: y = -0.0904 * 600 + 71.103 = 12.1036






Slave 3
40
35
30
25
20
15
10
5
0
0
100
200
300
400
500
600
700
800
y = -0.0902x + 71.038


Slave 4
40
35
30
25
20
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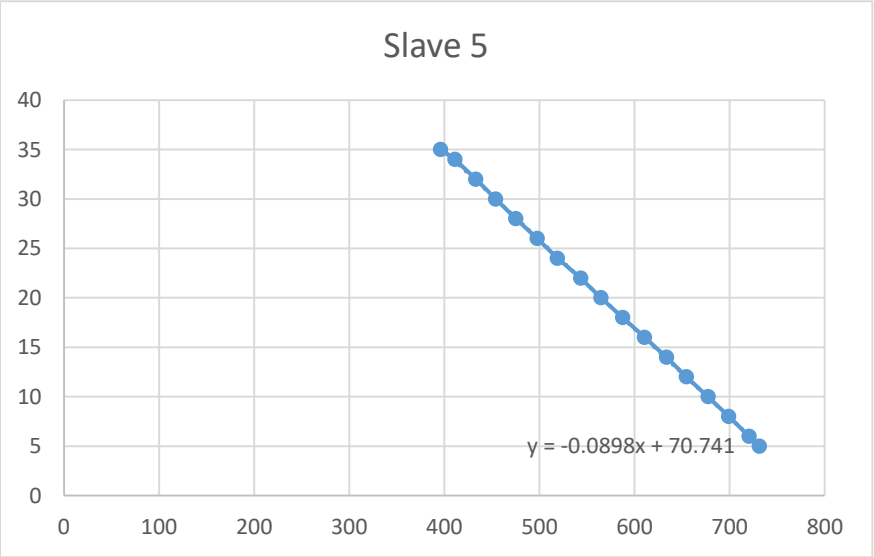
10
5
0
0
100
200
300
400
500
600
700
800
y = -0.0909x + 71.862


Slave 5
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35
30
25
20
15
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5
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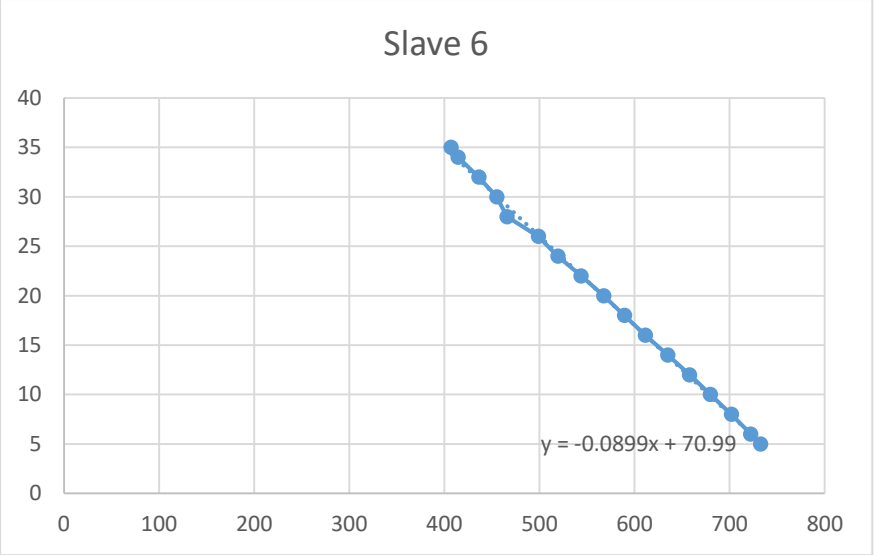
100
200
300
400
500
600
700
800
y = -0.0898x + 70.741


Slave 6
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100
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400
500
600
700
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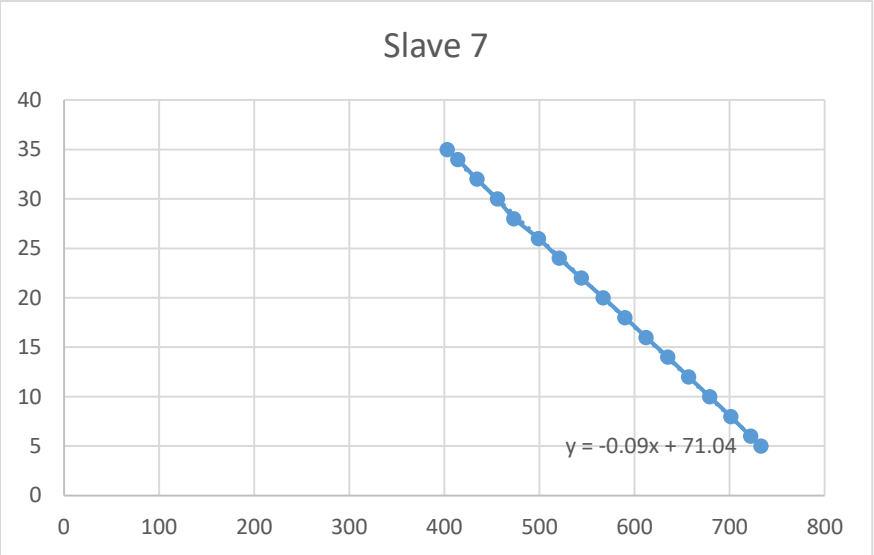
y = -0.0899x + 70.99


Slave 7
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35
30
25
20
15
10
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0
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100
200
300
400
500
600
700
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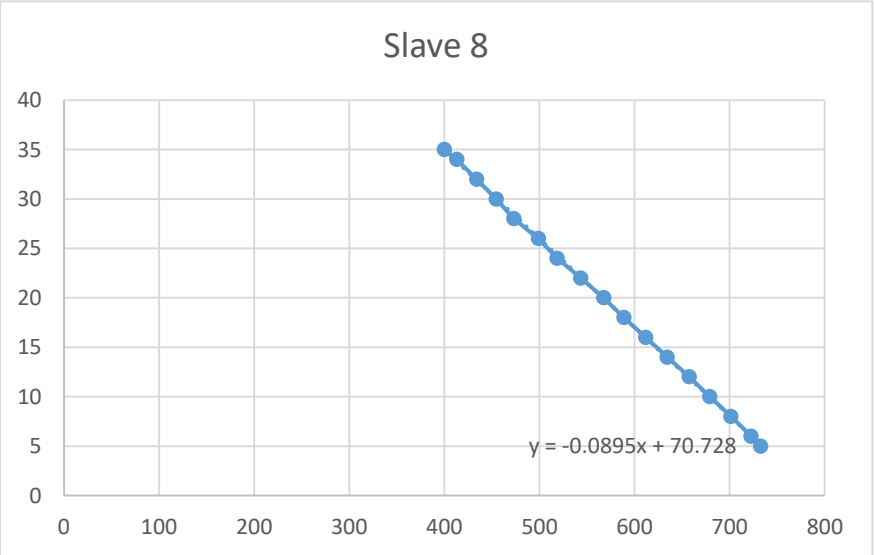
y = -0.09x + 71.04


Slave 8
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35
30
25
20
15
10
5
0
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100
200
300
400
500
600
700
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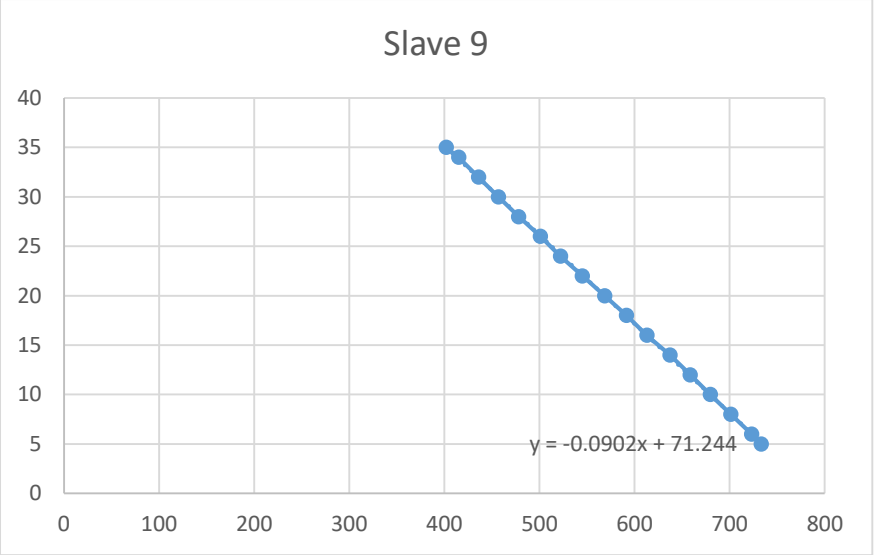
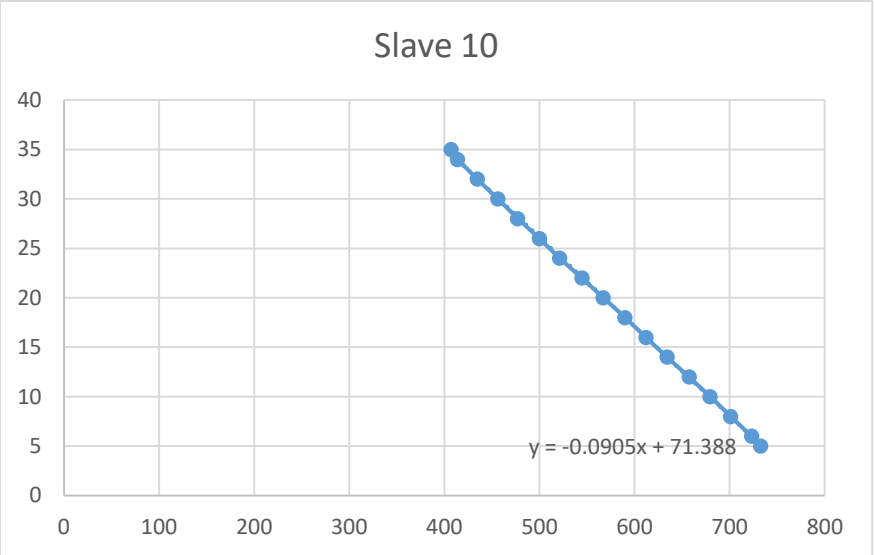
y = -0.0895x + 70.728


Slave 9
40
35
30
25
20
15
10
5
0
0
100
200
300
400
500
600
700
800
y = -0.0902x + 71.244


Slave 10
40
35
30
25
20
15
10
5
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0
100
200
300
400
500
600
700
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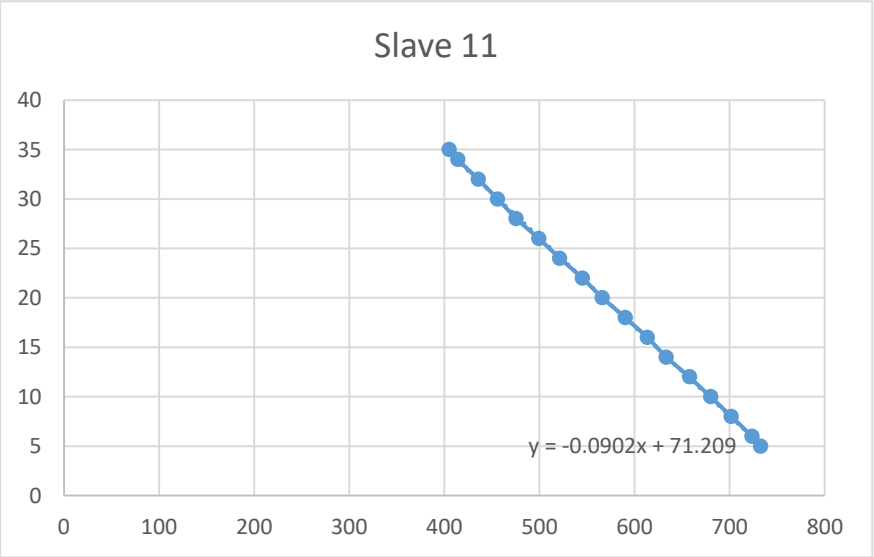
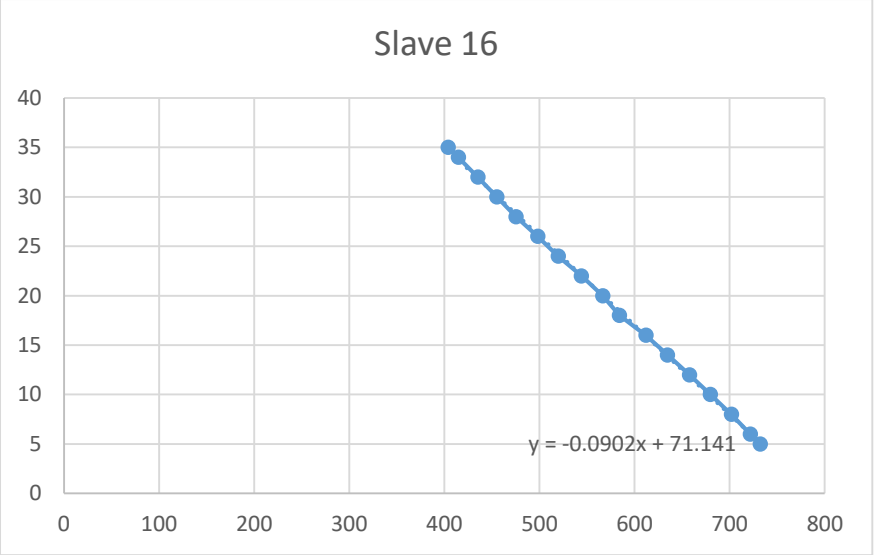
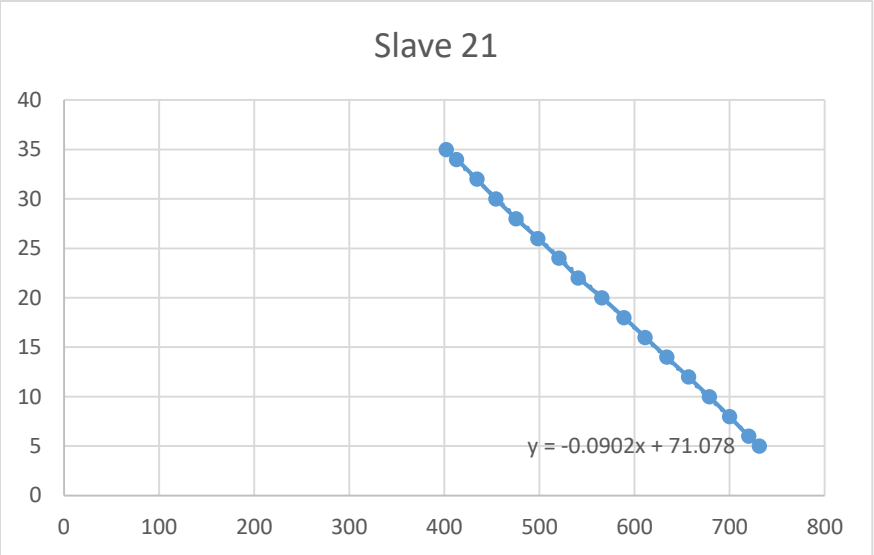
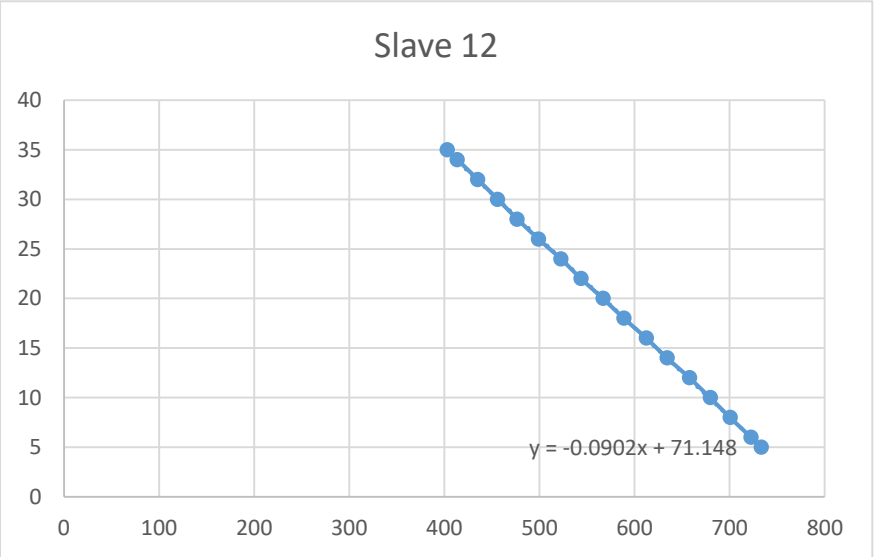
y = -0.0905x + 71.388


Slave 11
40
35
30
25
20
15
10
5
0
0
100
200
300
400
500
600
700
800
y = -0.0902x + 71.209


Slave 16
40
35
30
25
20
15
10
5
0
0
100
200
300
400
500
600
700
800
y = -0.0902x + 71.141


Slave 21
40
35
30
25
20
15
10
5
0
0
100
200
300
400
500
600
700
800
y = -0.0902x + 71.078


Slave 12
40
35
30
25
20
15
10
5
0
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100
200
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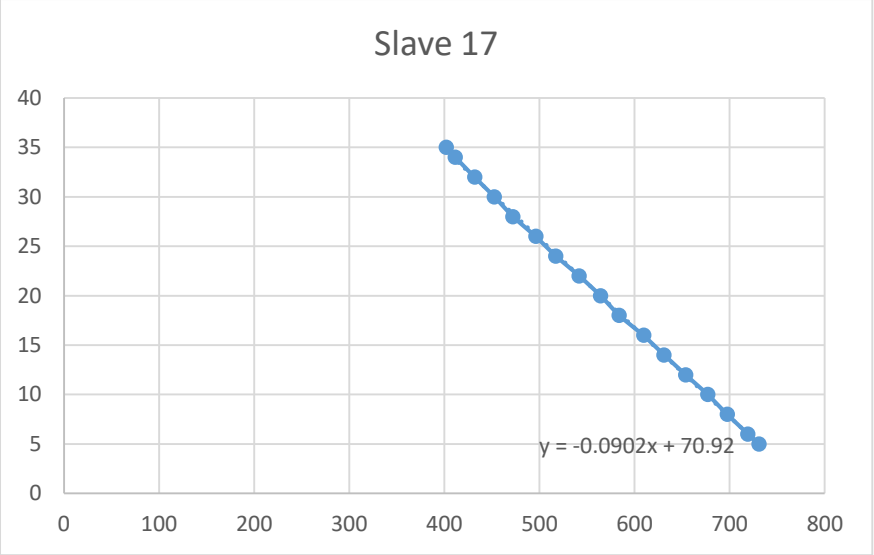
500
600
700
800
y = -0.0902x + 71.148


Slave 17
40
35
30
25
20
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10
5
0
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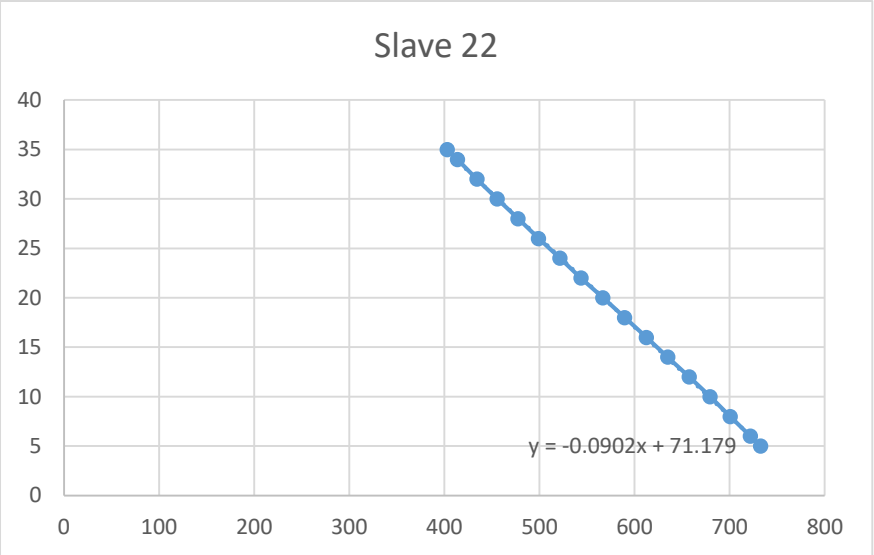
100
200
300
400
500
600
700
800
y = -0.0902x + 70.92


Slave 22
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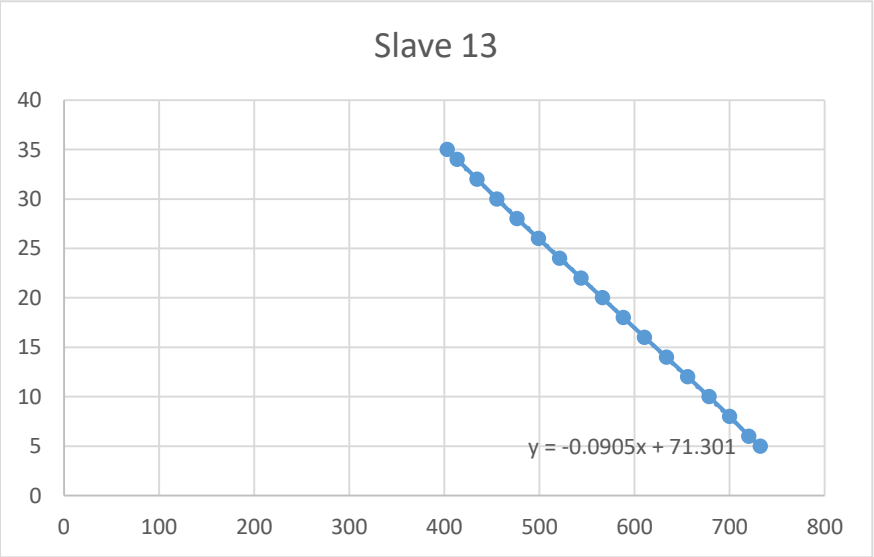
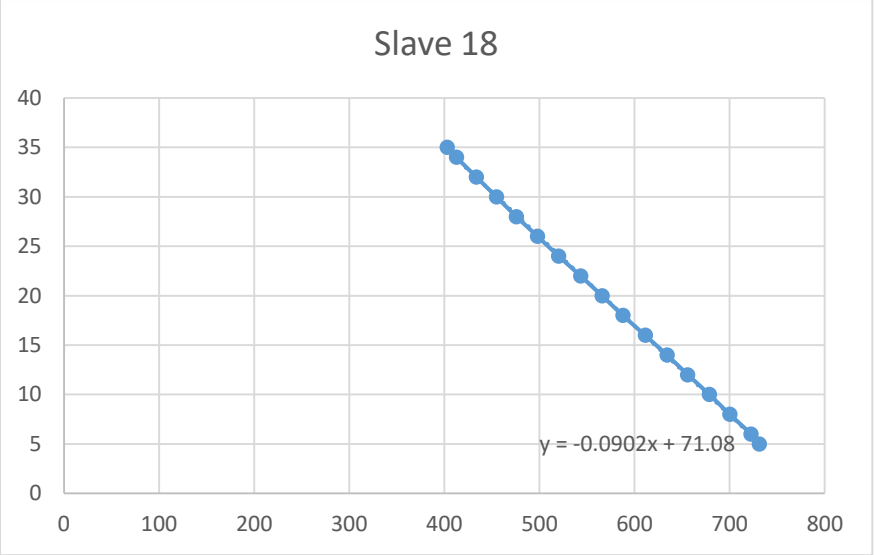
35
30
25
20
15
10
5
0
0
100
200
300
400
500
600
700
800
y = -0.0902x + 71.179


Slave 13
40
35
30
25
20
15
10
5
0
0
100
200
300
400
500
600
700
800
y = -0.0905x + 71.301


Slave 18
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35
30
25
20
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10
5
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100
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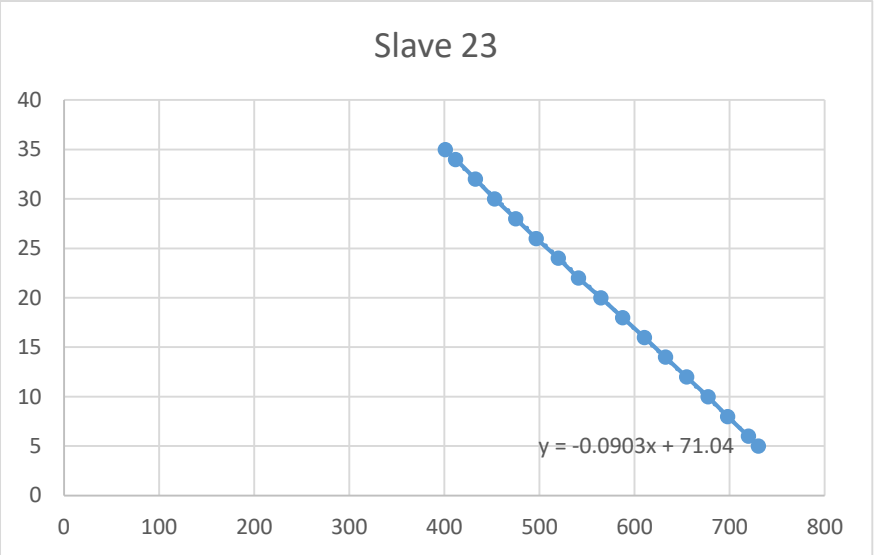
400
500
600
700
800
y = -0.0902x + 71.08


Slave 23
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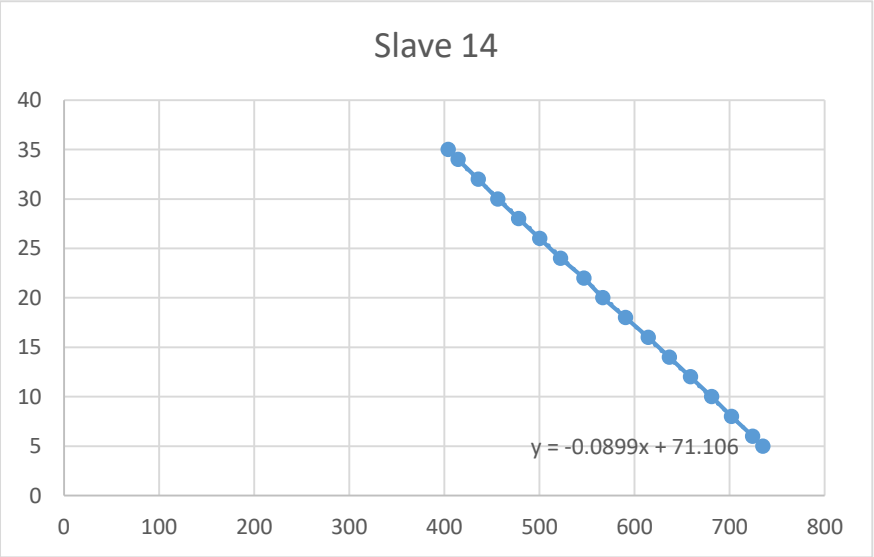
30
25
20
15
10
5
0
0
100
200
300
400
500
600
700
800
y = -0.0903x + 71.04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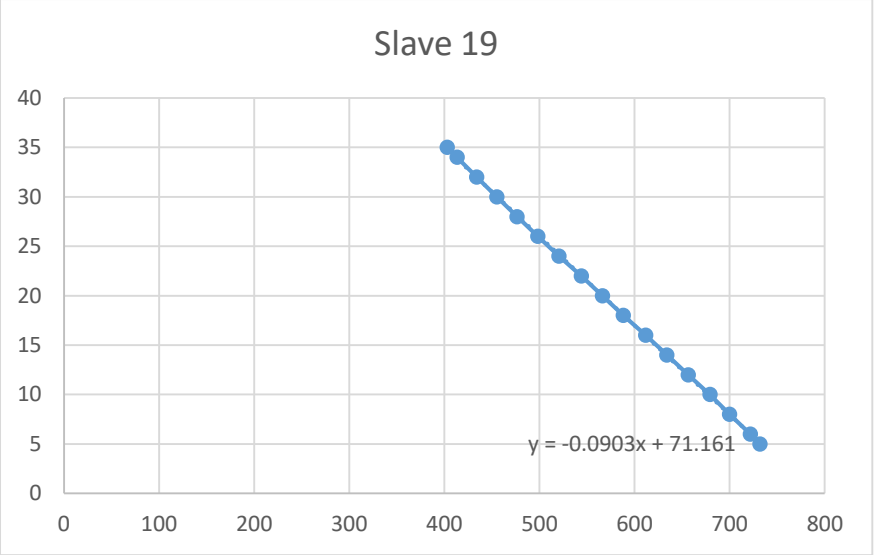
600
700
800
y = -0.0899x + 71.106


Slave 19
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35
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200
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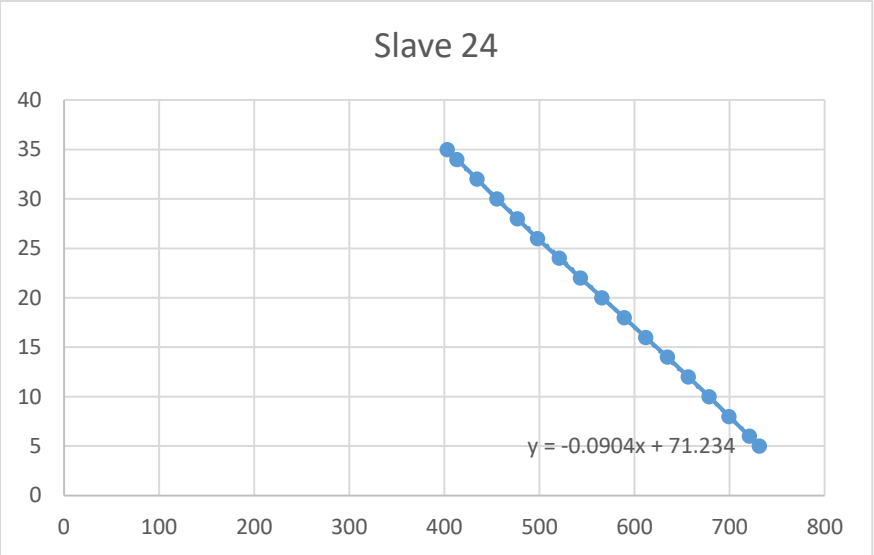
700
800
y = -0.0903x + 71.161


Slave 24
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500
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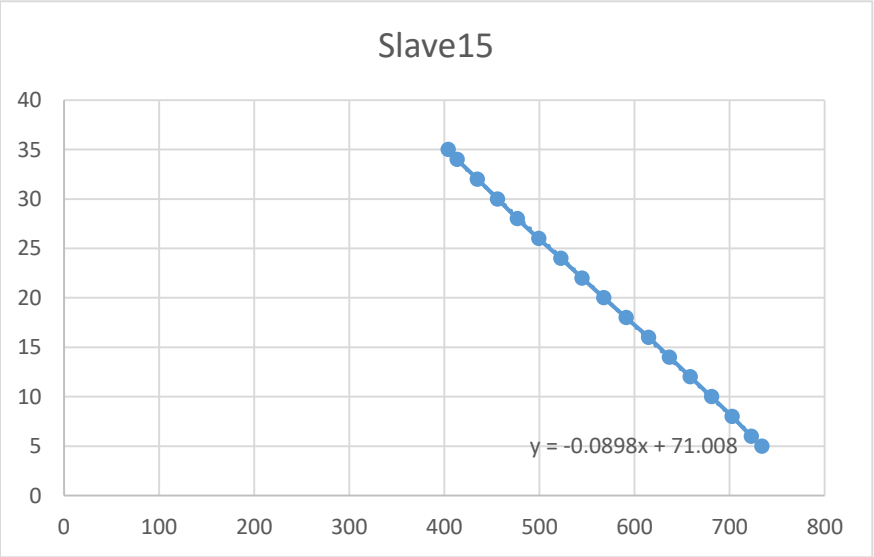
700
800
y = -0.0904x + 71.234


Slave15
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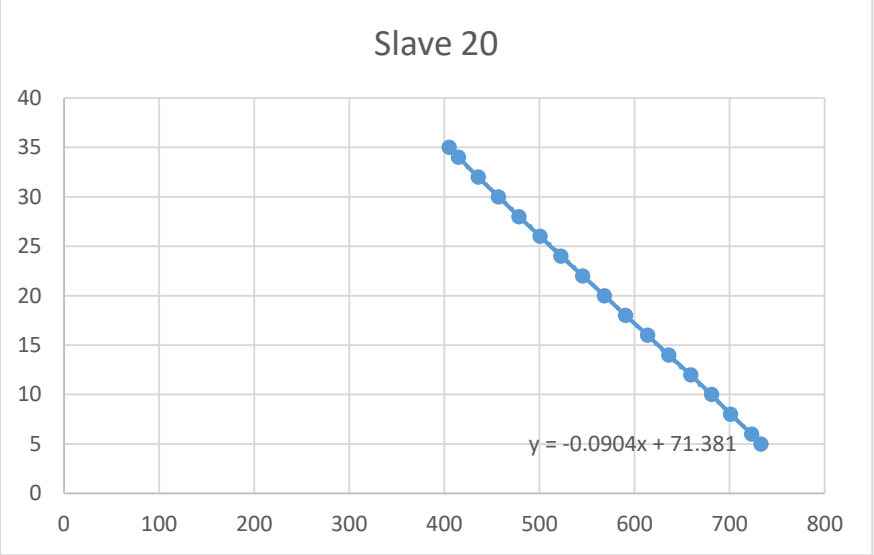
500
600
700
800
y = -0.0898x + 71.008


Slave 20
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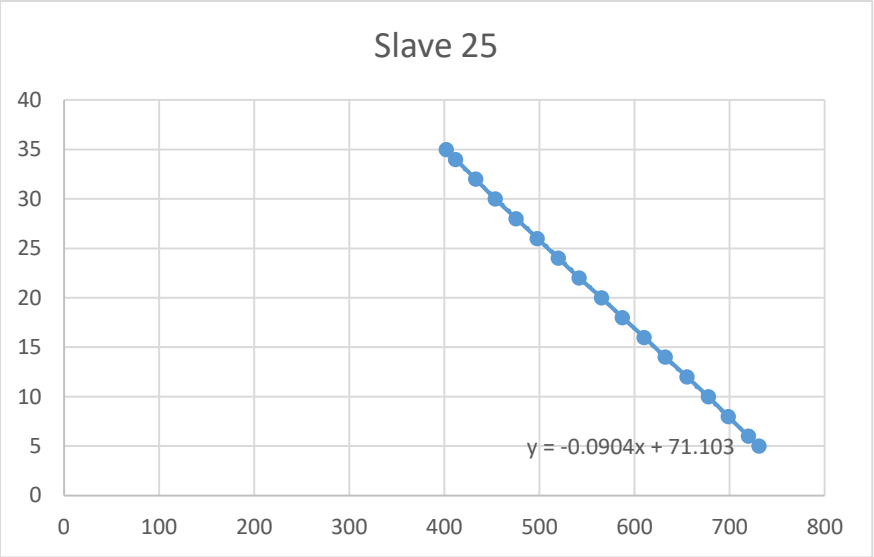
600
700
800
y = -0.0904x + 71.381


Slave 25
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y = -0.0904x + 71.103