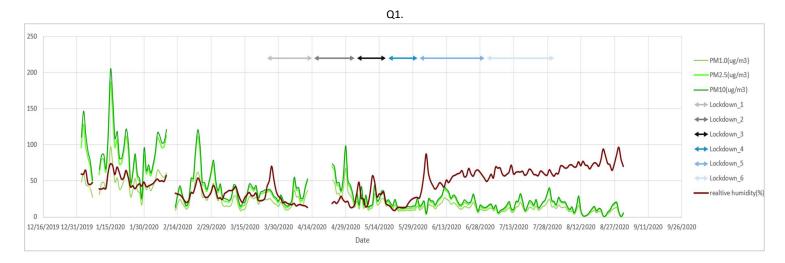
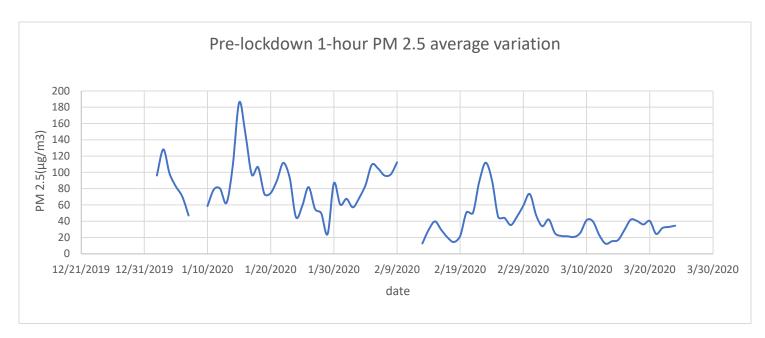
ES-209 HW 4

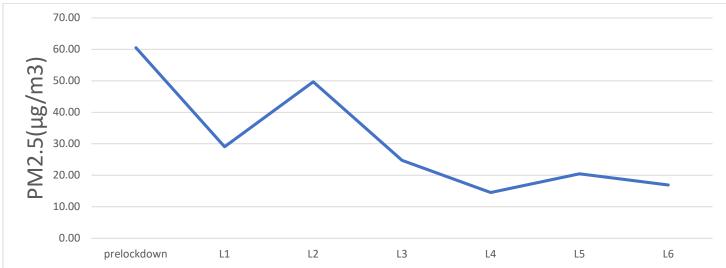
19d180006 Sanket Ambre 19d180019 Pranav Mahadkar 19d180008 Meghraj Chinchore



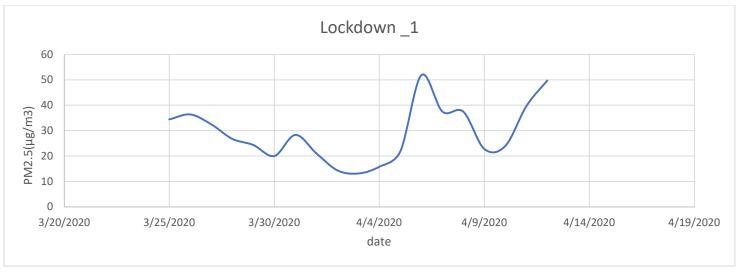
- The graph above shows the variation of PM(PM1,PM2.5,PM10) and Relative humidity with time (in days).
- We can observe that the PM values before the lockdown are quite high as compared to the general trend after the lockdown started.
- As the lockdown 1 started, relative humidity also started to decrease.
- We can observe a spike in PM concentration in Lockdown-2 which gradually lowered down as we were in lockdown-3. Contrast to it, the relative humidity increased comparatively in lockdown-3.
- The PM concentration as well as humidity achieved the lowest values in lockdown 4. Relative Humidity started to increase end of lockdown 4. The reason behind the increase may be the unlock 1 which lead to increase in pollution.
- The highest humidity point was noted in lockdown 5 where the highest points of PM1.0, PM2.5, PM10 were noted in lockdown 2.
- As we approach the end of the lockdown we can see that the PM concentrations are tending to a slightly
 fluctuating but low values and relative humidity is seen to be increasing slightly after achieving a minima
 in lockdown-4.

 The graphs below show 1-hour PM2.5 average data over different days starting from the pre-lockdown period till lockdown-6.

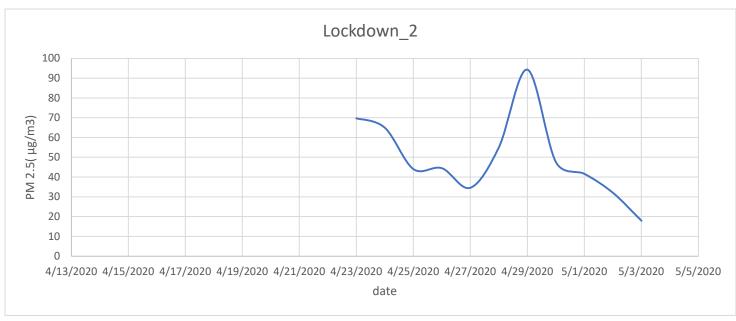




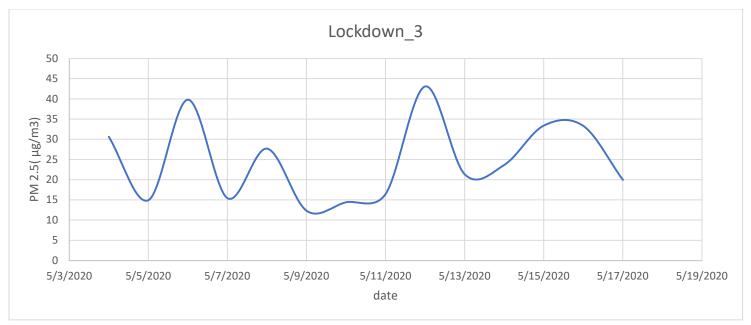
• In the pre-lockdown period, we can see that the PM values are quite high with maxima around 185.9 ug/m3 ani minimum of around 12.49 ug/m3 with an average of 60.5 ug/m3.



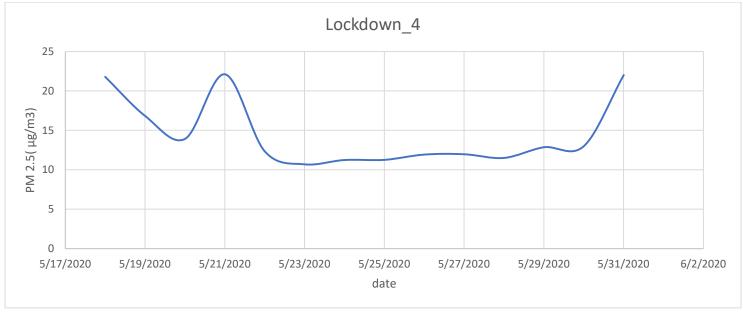
• In the lockdown-1, we can see that the PM values are lowered due to a sudden stop to human activities. We can observe a Maxima around 52 ug/m3 ani minimum of around 13 ug/m3 with an average of 29 ug/m3.



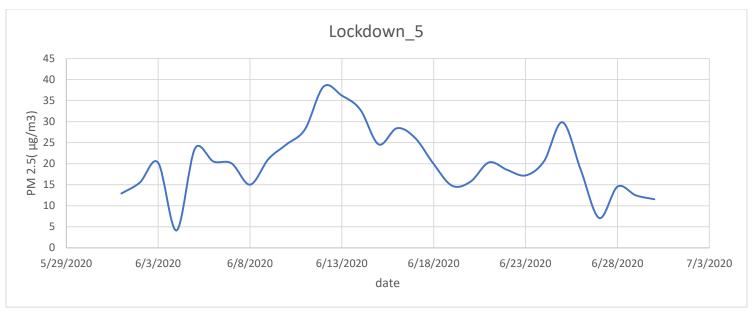
• In the lockdown-2, we can see that the PM values have a slight spike. We can observe a Maxima around 94 ug/m3 ani minimum of around 18 ug/m3 with an average of 49 ug/m3.



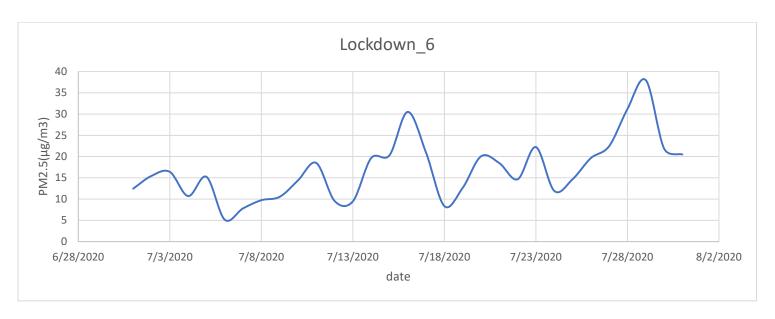
In the lockdown-3, we can see that the PM values again are lowered may be due to stricter actions by government. We can observe a Maxima around 43 ug/m3 ani minimum of around 12.34 ug/m3 with an average of 25 ug/m3.



• In the lockdown-4, we can see that the PM values are lowered due to a sudden stop to human activities. We can observe a Maxima around 22 ug/m3 ani minimum of around 10.7 ug/m3 with an average of 14.54 ug/m3.

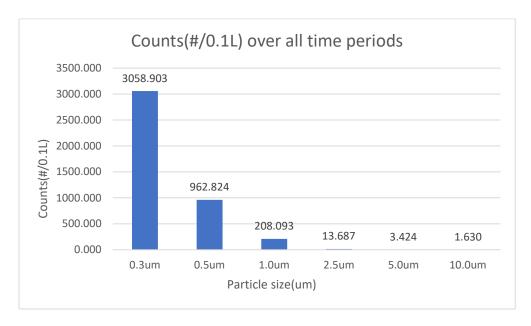


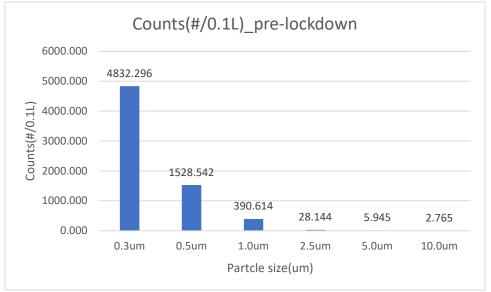
In the lockdown-5, we can see that the PM values are fluctuating a bit around a lower value. We can observe a Maxima around 38.33 ug/m3 ani minimum of around 4.15 ug/m3 with an average of 20.46 ug/m3.

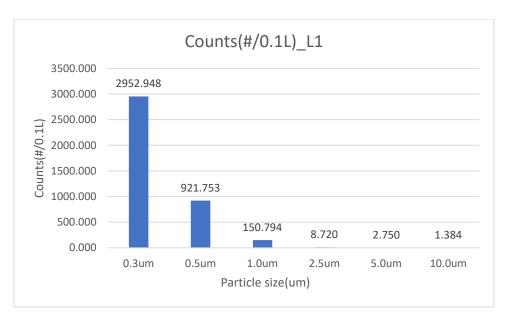


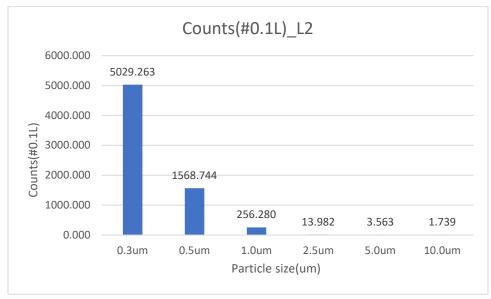
• In the lockdown-6, we can see that the PM concentration has a maxima around 34 ug/m3 ani minimum of around 5.18 ug/m3 with an average of 16.9 ug/m3.

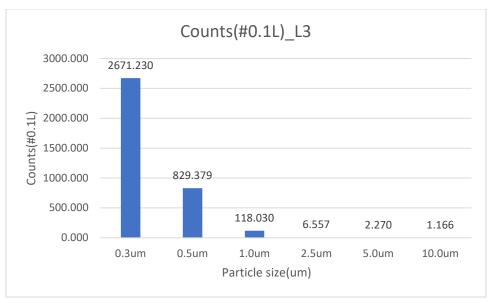
The graphs below show the Particle Size Distribution for the whole dataset and then separately for each lockdown. Each column represents the average of daily means of a specific size particulate matter.

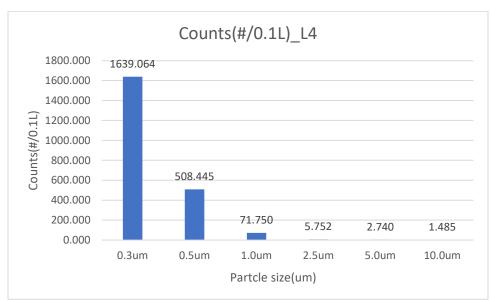


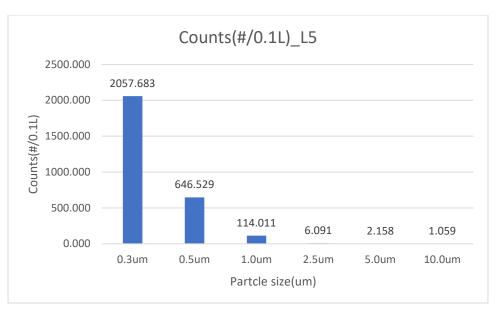


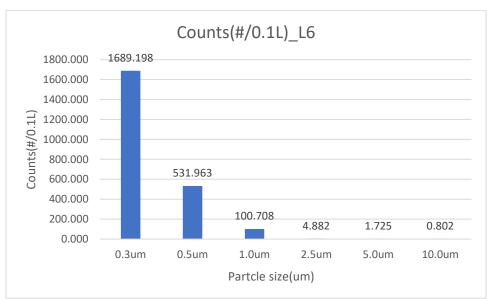


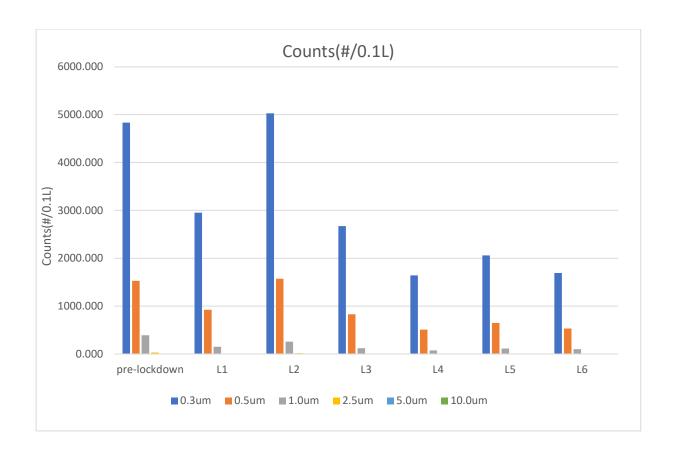












- Considering the whole dataset, we can observe that count of 0.3um(#/0.1L) is considerably higher than any other size of particulate matter.
- Lockdown 1 followed a similar trend but the absolute values of counts got lowered due to lesser human activities because of the strict lockdown restrictions.
- In lockdown 2, the PM counts(0.3um and 0.5um) increased to larger values, in fact larger than the pre-lockdown period. Relative trends were same as lockdown 1.
- Lockdown 3 experienced an decrease in counts of all size particulate matter and hence significant decrease in pollution as well.
- In lockdown 4, more decrease in the pollutants can be seen. PM0.3um still being the dominating pollutant size.
- Lockdown 5 saw a small increase in counts of all the sizes of particulate matter, relatively the distribution remaining the same.
- In lockdown 6, the counts decreased as compared to Lockdown 5. As compared to prelockdown stage, the counts in lockdown were considerably low.

• PM2.5(ug/m3) data for different time-periods:

	N	std dev	mean	difference(pre-lockdown-other lockdowns)
total	228.00	29.97	34.38	
Pre-lockdown	78.00	35.11	60.51	
L1	19.00	11.14	29.07	31.44
L2	11.00	20.80	49.70	10.81
L3	14.00	10.00	24.76	35.75
L4	14.00	4.31	14.54	45.97
L5	30.00	7.91	20.46	40.05
L6	31.00	7.31	16.90	43.61

Mean(x)	34.60
std-dev	12.786

а	0.05
t-critical	2.015

Considering a=0.05, that is confidence level of 95%, we get two tailed t-value=2.015 Assuming null Hypothesis; Ho = difference b/w pre-lockdown and each lockdown is zero, u=0

$$t = \frac{\overline{x} - \mu}{s / \sqrt{n}}$$

X = 34.60

u = 0

s = 12.76

n = 6

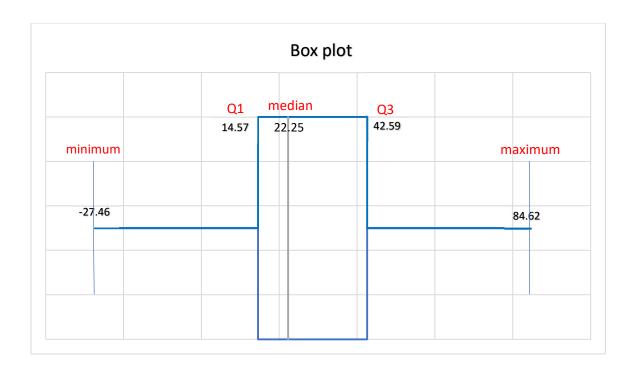
On solving, t = 6.63

t-critical = 2.015

t > t-critical ==> We can conclude that our assumption is wrong and there is significant difference b/w PM2.5 concentration means of pre-lockdown period and other lockdowns

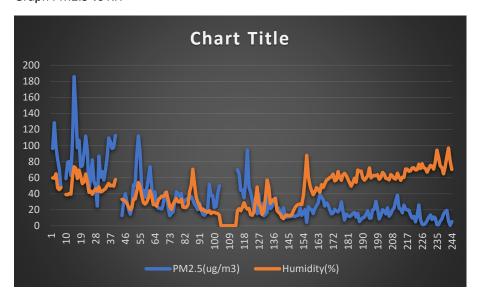
• BOX PLOT for whole data of PM2.5 avg concentration data (ug/m3):

IQR		28.02
Q1-1.5*IQR		-27.46
Q1	57.25	14.57
Q3	171.75	42.59
Q3+1.5*IQR		84.62

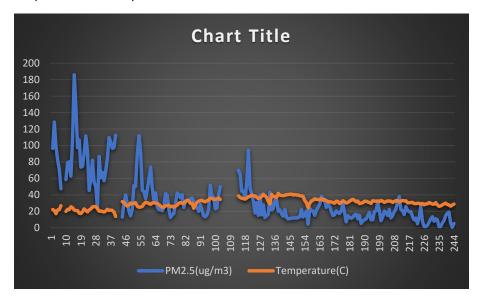


- We can infer from the box plot above that most of values lie between that the data values are concentrated in the region b/w 14.57 ug/m3 and 42.59 ug/m3 with a median value of 22.25 ug/m3.
- Values beyond 84.62 ug/m3 and values below -27.46 ug/m3 can be considered as outliers.

Q5. Graph PM2.5 vs RH



Graph PM2.5 vs Temperature



For 70% data, we will take 5 months and 18 days i.e. from 01-01-2020 to 18-06-2020 (170 days).

Now, Applying linear regression,

Here, y=PM2.5 & x=RH,

So, our regression line would be y=mx+c.

Mean of x=5508.44/170=32.40

Mean of y=6781.33/170=39.89

Sx=(235867.6-(5508.44^2)/170)/169=339.525

Sy=(454020.8-(6781.33^2)/170)/169=1085.87

Sxy=(285400.1-(5508.44*6781.33)/170)/169=388.56

So, Co-relation coefficient (r)=388.56/(339.525*1085.87)=0.00105

So, m= r*Sy/Sx =0.00105*1085.87/339.525=0.00335 &

c=39.89-0.00335*32.40=39.781

So, linear regression equation is y=0.00335*x +39.781.

Now, to verify remaining 30% data,

y1 = m*x1 + c

19-06-2020 15.74209246 64.33055266 39.99650735 0.6006413322 0.367737117 21-06-2020 20.31331837 55.85684503 39.96812043 0.491611846 0.241682207 22-06-2020 18.52918694 57.176164 39.97254015 0.536452103 0.287780859 23-06-2020 17.22747826 67.49530435 40.00710927 0.569389577 0.32420446 24-06-2020 20.61870003 60.09176225 39.9823074 0.484304399 0.2434550751 25-06-2020 29.8402223 56.65022577 39.97077826 0.253449055 0.064236423 27-06-2020 7.111652174 55.3426087 39.99989774 0.822208241 0.67602639 28-06-2020 14.56636553 62.41556637 39.99909215 0.635750638 0.687500719 0.472678723 29-06-2020 12.4923558 58.09867964 39.97563058 0.687500719 0.472678723 29-06-2020 12.46089677 49.23218631 39.94592782 0.688055893 0.473420912 01-07-2020 15.48957609 53.38082001 39.95982575 0.61237128 0.374398585 05-07-2020 15.4360573 64.1510868 39.9956353 0.589512016 0.347524417 04-07-2020 10.72446143 54.16018068 39.9954374 0.80395579 0.633759484 05-07-2020 5.183460737 67.4774149 40.00795493 0.870439248 0.57664484 05-07-2020 10.54308548 56.91452397 39.99166366 0.731636448 0.535291889 06-07-2020 10.54308548 56.91452397 39.99166366 0.73623601 0.542043463 10-07-2020 10.54308548 56.91452397 39.99166366 0.73623601 0.542043463 10-07-2020 10.54308548 56.91452397 39.99166366 0.73623601 0.542043463 10-07-2020 19.66620366 61.81571627 39.9808825 0.755719414 0.5111183 09-07-2020 19.66620366 61.81571627 39.98088265 0.756273214 0.59090328 13-07-2020 20.32036136 62.93826963 39.9978677 0.434886075 0.25994118 13-07-2020 19.66620366 61.81571627 39.9808265 0.508198399 0.528265613 15-07-2020 19.6862036 62.35408696 39.9938510 0.53776947 0.258805375 0.2599418 15-07-2020 19.6862036 62.3564671 59.666713 39.99385416 0.478632787 0.2598034 15-07-2020 19.6862036 62.3564674 39.99394166 0.478632787 0.2598034 15-07-2020 19.6562036 62.3564676 39.99385416 0.478632787 0.25880538 15-07-2020 19.6562036 62.3564675 39.99363501 0.537469776 0.28887376 15-07-2020 19.6395509 62.556669 62.356669 39.99371254 0.486624113 0.26863037 25-07	Data	DN42 F()		1_0.00225*20.701	/1\/1	-^2
2-0-6-2020				•		z^2
21-06-2020 20.31931897 55.85684503 39.96812043 0.491611846 0.241682207 22-06-2020 17.22747826 67-4550435 39.97254015 0.536452103 0.287780855 24-06-2020 29.8402223 56.65022577 39.97077826 0.253449055 0.064236423 27-06-2020 18.55998829 63.1129649 39.99376284 0.535928861 0.35728855 27-06-2020 7.111652174 65.3426087 39.99909714 0.822208241 0.676026392 29.66-2020 12.4529585 80.9867964 39.99508508 0.857500719 0.472657238 30.06-2020 12.4523558 50.98687964 39.99508824 0.710886409 0.505359486 0.07-2020 12.46089677 49.23218631 39.94592782 0.68055893 0.473420912 0.07-2020 12.46089677 49.23218631 39.954592782 0.68055893 0.374320912 0.07-2020 15.48957609 33.8082001 39.9596255 0.61237128 0.347524417 0.0707020 10.72446143 54.16018068 39.95643661 0.731636448 0.535291892 0.07-2020 5.24965229 0.945514604 40.01367474 0.618888982 0.38023573 0.607-2020 7.84358707 68.13868613 40.0092646 0.80395573 0.62043484076 0.6707-2020 10.54308548 59.36670143 39.9986825 0.755719414 0.571111833 0.907-2020 1.65308548 56.91452397 39.97166366 0.73623601 0.5764048 0.707-2020 1.65308548 56.91452397 39.97166366 0.73623601 0.574043461 0.7707-2020 1.054308548 56.91452397 39.99166366 0.73623601 0.571111833 0.907-2020 1.96662036 61.81571627 39.9880865 0.50819839 0.25865613 1.007-2020 9.504517026 59.6542738 39.99886819 0.536717644 0.288055829 1.007-2020 2.032036136 62.90826963 39.9917427 0.491886075 0.24903463 1.007-2020 2.032036136 62.90826963 39.9917427 0.491886075 0.24903463 1.007-2020 2.032036136 62.90826963 39.9917427 0.491886075 0.24903493 0.57940377 0.208184940 0.59186494 0.0098834 0.60000000000000000000000000000000000						
22-06-2020						
23-06-2020 17.22747826 67.49530435 40.00710927 0.569389577 0.32420449						
24-06-2020 20.61870003 60.09176225 39.9823074 0.484304399 0.234550751 25-06-2020 29.8402223 56.65022577 39.97077826 0.253449055 0.064236423 27-06-2020 7.111652174 65.3426087 39.99989774 0.822208241 0.676026392 28-06-2020 14.56636553 62.41556637 39.99009215 0.635750638 0.404178874 29-06-2020 12.4923558 58.09867964 39.97563058 0.687500719 0.472657233 30-06-2020 11.55323591 53.69798191 39.96088824 0.710886409 0.505359486 01-07-2020 12.46089677 49.23218631 39.94592782 0.688055893 0.473420912 02-07-2020 15.48957609 53.38082001 39.95982575 0.61237128 0.347524417 04-07-2020 15.2496522 69.45514604 40.01367474 0.618888982 0.38302573 05-07-2020 15.2496522 69.45514604 40.01367474 0.618888982 0.38302573 06-07-2020 7.84358707 68.13866613 40.00975493 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
25-06-2020						
26-06-2020						
27-06-2020		29.8402223				
28-06-2020 14.56636553 62.41556637 39.99009215 0.635750638 0.40178874 29-06-2020 12.4923558 88.09867964 39.97563058 0.687500719 0.47567523 30-06-2020 11.55323591 53.69798191 39.96088824 0.710886409 0.505359486 01-07-2020 15.48957609 53.38082001 39.9592575 0.61237128 0.374998585 03-07-2020 16.41113043 59.27269565 39.9756353 0.589512016 0.374998585 05-07-2020 16.24965229 69.45514604 40.01367474 0.618888982 0.33032573 06-07-2020 5.183460737 67.74774149 40.00795493 0.870439248 0.757664484 08-07-2020 7.84358707 68.13868613 40.0092646 0.80395573 0.67664484 08-07-2020 10.54308548 56.91452397 39.97166366 0.73623601 0.542043463 10-07-2020 14.40841154 59.36670143 39.9888619 0.536717644 0.288068823 11-07-2020 9.557678944 71.97567755 40.02211852 0			63.51129649	39.99376284	0.535928681	0.287219551
29-06-2020	27-06-2020		65.3426087	39.99989774	0.822208241	0.676026392
30-06-2020	28-06-2020	14.56636553	62.41556637	39.99009215		0.404178874
01-07-2020 12.46089677 49.23218631 39.94592782 0.688055893 0.473420912 02-07-2020 15.48957609 53.38082001 39.95982575 0.61237128 0.374998585 0.473420912 0.72446143 54.16018068 39.95243661 0.731636448 0.535291892 0.60-07-2020 15.24965229 69.45514604 40.01367474 0.618888982 0.383023573 0.60-07-2020 5.183460737 67.74774149 40.00795493 0.870439248 0.757664484 0.707-07-2020 7.84358707 68.13868613 40.0092646 0.80395573 0.646344816 0.67-2020 9.766504517 59.6066713 39.9968235 0.755719414 0.571111833 0.907-2020 10.54308548 56.91452397 39.97166366 0.73623601 0.542043463 10-07-2020 14.40841154 59.36670143 39.9787845 0.639608421 0.409988932 11-07-2020 9.557678944 71.97567755 40.02211852 0.761190079 0.579410337 13-07-2020 9.504517026 59.6542738 39.98084182 0.762273214 0.581060453 14-07-2020 19.66620306 61.81571627 39.98088265 0.508198399 0.258265613 15-07-2020 20.32036136 62.90826963 39.9917427 0.491886075 0.249151911 16-07-2020 20.8515299 63.56467316 39.99394166 0.478632787 0.229089345 19-07-2020 1.70629128 60.07542579 39.9825268 0.682201716 0.665399182 21-07-2020 20.88154299 63.56467316 39.99394166 0.478632787 0.229089345 21-07-2020 1.8.9965254 64.36865879 39.99728819 0.7013264 0.62468879 22-07-2020 14.68682656 63.72019465 39.99728819 0.7013264 0.491858715 22-07-2020 14.68682656 63.72019465 39.99728879 0.4373839 0.25895346 22-07-2020 14.68682656 63.7201968 39.99728819 0.7013264 0.491858715 22-07-2020 19.6395509 62.17309698 39.99728819 0.7013264 0.491858715 0.40040863 22-07-2020 19.6395509 62.17309698 39.99728819 0.7013264 0.491858715 0.40040863 22-07-2020 21.90852174 60.4869565 39.99363571 0.4373839 0.25895346 0.050274337 0.49262811 0.204360785 30.07-2020 21.90852174 60.48669565 39.99363713 0.452062811 0.204360785 30.07-2020	29-06-2020	12.4923558	58.09867964	39.97563058	0.687500719	0.472657239
02-07-2020 15.48957609 53.38082001 39.95982575 0.61237128 0.374998585 03-07-2020 16.41113043 59.27269565 39.97956353 0.589512016 0.347524417 04-07-2020 15.24965229 69.45514604 40.01367474 0.618888982 0.383023573 06-07-2020 5.183460737 67.74774149 40.00759433 0.870439248 0.757664484 07-07-2020 7.84358707 68.13868613 40.0092646 0.80395573 0.646344816 08-07-2020 10.54308548 56.91452397 39.97166366 0.73623601 0.57111183 09-07-2020 14.40841154 59.36670143 39.98988619 0.536717644 0.28805825 11-07-2020 18.5266087 62.35408696 39.98988619 0.536717644 0.288065829 12-07-2020 9.557678944 71.97567755 40.02211852 0.761190079 0.57941033 13-07-2020 19.6620306 61.81571627 39.9808265 0.508198399 0.258265613 15-07-2020 20.32036136 62.390826963 39.9917477 <td< td=""><td>30-06-2020</td><td>11.55323591</td><td>53.69798191</td><td>39.96088824</td><td>0.710886409</td><td>0.505359486</td></td<>	30-06-2020	11.55323591	53.69798191	39.96088824	0.710886409	0.505359486
03-07-2020 16.41113043 59.27269565 39.97956353 0.589512016 0.347524417 04-07-2020 10.72446143 54.16018068 39.96243661 0.731636484 0.535291892 05-07-2020 15.24965229 69.45514604 40.01367474 0.618884982 0.383023573 06-07-2020 5.183460737 67.74774149 40.00795493 0.870439248 0.757664484 07-07-2020 7.84358707 68.13868613 40.0092646 0.80395573 0.646344816 08-07-2020 19.54308548 56.91452397 39.97166366 0.73623601 0.542043463 10-07-2020 14.40841154 59.36670143 39.997987845 0.639608421 0.409098932 11-07-2020 18.5266087 62.35408696 39.98988619 0.536717644 0.288065829 12-07-2020 9.557678944 71.97567755 40.02211852 0.761190079 0.579410337 13-07-2020 9.504517026 59.6542738 39.980804182 0.762273214 0.581160493 14-07-2020 20.32036136 62.99826963 39.9917427	01-07-2020	12.46089677	49.23218631	39.94592782	0.688055893	0.473420912
04-07-2020 10.72446143 54.16018068 39.96243661 0.731636448 0.535291892 05-07-2020 15.24965229 69.45514604 40.01367474 0.618888982 0.383023573 06-07-2020 7.84358707 68.13868613 40.0092646 0.80395573 0.646344816 08-07-2020 9.766504517 59.6066713 39.98068235 0.755719414 0.571111833 09-07-2020 10.54308548 56.91452397 39.97166366 0.73623601 0.542043463 10-07-2020 14.40841154 59.36670143 39.97987845 0.639608421 0.409098932 11-07-2020 18.5266087 23.5408696 39.98988619 0.536717644 0.288065829 12-07-2020 9.504517026 59.6542738 39.98084182 0.761190079 0.579410337 13-07-2020 19.66620306 61.81571627 39.9880265 0.508198399 0.258265613 15-07-2020 20.32036136 62.90826963 39.9917427 0.491886075 0.241951911 16-07-2020 30.53284672 62.3274244 39.985265 0	02-07-2020	15.48957609	53.38082001	39.95982575	0.61237128	0.374998585
05-07-2020 15.24965229 69.45514604 40.01367474 0.618888982 0.383023573 06-07-2020 5.183460737 67.74774149 40.00795493 0.870439248 0.757664484 07-07-2020 7.84358707 68.13868613 40.0092646 0.80395573 0.646344816 08-07-2020 10.54308548 56.91452397 39.97166366 0.73623601 0.542034463 10-07-2020 14.40841154 59.36670143 39.97987845 0.639608421 0.409098932 11-07-2020 18.5266087 62.35408696 39.98988619 0.536717644 0.288065829 12-07-2020 9.557678944 71.97567755 40.02211852 0.761190079 0.579410337 13-07-2020 19.66620306 61.81571627 39.98808615 0.508198399 0.258265613 15-07-2020 20.32036136 62.90826963 39.9917427 0.491886075 0.241951911 16-07-2020 30.53284672 62.3274244 39.98979687 0.236484076 0.055924718 17-07-2020 20.8515299 63.56467316 39.9945256 <	03-07-2020	16.41113043	59.27269565	39.97956353		0.347524417
06-07-2020 5.183460737 67.74774149 40.00795493 0.870439248 0.757664484 07-07-2020 7.84358707 68.13868613 40.0092646 0.80395573 0.646344816 08-07-2020 10.54308548 56.91452397 39.98068235 0.755719414 0.571111833 09-07-2020 14.40841154 59.36670143 39.97987845 0.639608421 0.409089932 11-07-2020 18.5266087 62.35408696 39.98988619 0.536717644 0.288065829 12-07-2020 9.557678944 71.97567755 40.02211852 0.761190079 0.579410337 13-07-2020 9.504517026 59.6542738 39.98084182 0.762273214 0.581060453 15-07-2020 20.32036136 62.90826963 39.9917427 0.491886075 0.241951911 16-07-2020 30.53284672 62.3274244 39.98897687 0.236484076 0.055924718 17-07-2020 20.8515299 63.56467316 39.997525226 0.790372564 0.62468879 19-07-2020 12.70629128 60.07542579 39.98225268	04-07-2020	10.72446143	54.16018068	39.96243661	0.731636448	0.535291892
07-07-2020 7.84358707 68.13868613 40.0092646 0.80395573 0.646344816 08-07-2020 9.766504517 59.6066713 39.98068235 0.755719414 0.571111833 09-07-2020 10.54308548 56.91452397 39.97166366 0.73623601 0.542043463 10-07-2020 14.40841154 59.36670143 39.97987845 0.639608421 0.409098932 11-07-2020 18.5266087 62.35408696 39.98988619 0.536717644 0.288065829 12-07-2020 9.557678944 71.97567755 40.02211852 0.761190079 0.579410337 13-07-2020 9.504517026 59.6542738 39.98084182 0.762273214 0.581060453 14-07-2020 19.66620306 61.81571627 39.98084265 0.508198399 0.258265613 15-07-2020 20.32036136 62.3274244 39.98979687 0.236484076 0.055924718 17-07-2020 20.8515299 63.56467316 39.993494166 0.478632787 0.229089345 18-07-2020 12.70629128 60.07542579 39.98225268	05-07-2020	15.24965229	69.45514604	40.01367474	0.618888982	0.383023573
08-07-2020 9.766504517 59.6066713 39.98068235 0.755719414 0.571111833 09-07-2020 10.54308548 56.91452397 39.97166366 0.73623601 0.542043463 10-07-2020 14.40841154 59.36670143 39.97987845 0.639608421 0.409098932 11-07-2020 9.557678944 71.97567755 40.02211852 0.761190079 0.579410337 13-07-2020 9.504517026 59.6542738 39.98084182 0.762273214 0.581060453 14-07-2020 19.66620306 61.81571627 39.98088265 0.508198399 0.258265613 15-07-2020 20.32036136 62.90826963 39.9917427 0.491886075 0.241951911 16-07-2020 30.53284672 63.56467316 39.99394166 0.478632787 0.229089345 18-07-2020 20.8515299 60.07542579 39.9825268 0.682201716 0.62468879 20-07-2020 12.70629128 60.07542579 39.9825568 0.682201716 0.465399182 21-07-2020 18.49965254 64.36865879 39.9728579 <	06-07-2020	5.183460737	67.74774149	40.00795493	0.870439248	0.757664484
09-07-2020 10.54308548 56.91452397 39.97166366 0.73623601 0.542043463 10-07-2020 14.40841154 59.36670143 39.97987845 0.639608421 0.409098932 11-07-2020 18.5266087 62.35408696 39.98988619 0.536717644 0.288065829 12-07-2020 9.557678944 71.97567755 40.02211852 0.761190079 0.579410337 13-07-2020 9.504517026 59.6542738 39.98808265 0.508198399 0.258265613 14-07-2020 19.66620306 61.81571627 39.98979687 0.236848075 0.241951911 16-07-2020 20.32036136 62.90826963 39.9917427 0.491886075 0.241951911 16-07-2020 20.8515299 63.56467316 39.99879687 0.236484076 0.055924718 18-07-2020 12.70629128 60.07542579 39.98225268 0.682201716 0.465399182 20-07-2020 12.08133472 64.36865879 39.997255226 0.7937469776 0.28887372 21-07-2020 14.67292318 59.18526243 39.977288419	07-07-2020	7.84358707	68.13868613	40.0092646	0.80395573	0.646344816
10-07-2020 14.40841154 59.36670143 39.97987845 0.639608421 0.409098932 11-07-2020 18.5266087 62.35408696 39.98988619 0.536717644 0.288065829 12-07-2020 9.557678944 71.97567755 40.02211852 0.761190079 0.579410337 13-07-2020 9.504517026 59.6542738 39.98084182 0.762273214 0.581060453 14-07-2020 19.66620306 61.81571627 39.98808265 0.508198399 0.258265613 15-07-2020 20.32036136 62.90826963 39.9917427 0.491886075 0.241951911 16-07-2020 20.8515299 63.56467316 39.99394166 0.478632787 0.229089345 18-07-2020 83.79909628 57.98574904 39.97525226 0.790372564 0.62468879 19-07-2020 12.70629128 60.07542579 39.98225268 0.682201716 0.465399182 20-07-2020 18.49965254 64.36865879 39.99663501 0.537469776 0.28887376 22-07-2020 14.67292318 59.18526243 39.97728579	08-07-2020	9.766504517	59.6066713	39.98068235	0.755719414	0.571111833
11-07-2020 18.5266087 62.35408696 39.98988619 0.536717644 0.288065829 12-07-2020 9.557678944 71.97567755 40.02211852 0.761190079 0.579410337 13-07-2020 9.504517026 59.6542738 39.98084182 0.762273214 0.581060453 14-07-2020 19.66620306 61.81571627 39.98808265 0.508198399 0.258265613 15-07-2020 20.323036136 62.99826963 39.9917427 0.491886075 0.241951911 16-07-2020 30.53284672 62.3274244 39.98979687 0.236484076 0.055924718 17-07-2020 20.8515299 63.56467316 39.99394166 0.478632787 0.229089345 18-07-2020 12.70629128 60.07542579 39.98225268 0.682201716 0.465399182 20-07-2020 18.49965254 64.36865879 39.99663501 0.537469776 0.28887376 22-07-2020 14.67292318 59.18526243 39.97728579 0.443768575 0.196930548 24-07-2020 11.93884642 57.28005559 39.97728579	09-07-2020	10.54308548	56.91452397	39.97166366	0.73623601	0.542043463
12-07-2020 9.557678944 71.97567755 40.02211852 0.761190079 0.579410337 13-07-2020 9.504517026 59.6542738 39.98084182 0.762273214 0.581060453 14-07-2020 19.66620306 61.81571627 39.98808265 0.508198399 0.258265613 15-07-2020 20.32036136 62.90826963 39.9917427 0.491886075 0.241951911 16-07-2020 30.53284672 62.3274244 39.98979687 0.236484076 0.055924718 17-07-2020 20.8515299 63.56467316 39.99394166 0.478632787 0.229089345 18-07-2020 8.379909628 57.98574904 39.97525226 0.790372564 0.62468879 19-07-2020 12.70629128 60.07542579 39.98225268 0.682201716 0.465399182 20-07-2020 20.08133472 66.39346542 40.00341811 0.498009528 0.24801349 21-07-2020 18.49965254 64.36865879 39.97288519 0.632986722 0.40067219 23-07-2020 14.67292318 59.18526243 39.97728879	10-07-2020	14.40841154	59.36670143	39.97987845	0.639608421	0.409098932
13-07-2020 9.504517026 59.6542738 39.98084182 0.762273214 0.581060453 14-07-2020 19.66620306 61.81571627 39.98808265 0.508198399 0.258265613 15-07-2020 20.32036136 62.90826963 39.9917427 0.491886075 0.241951911 16-07-2020 30.53284672 62.3274244 39.98979687 0.236484076 0.055924718 17-07-2020 20.8515299 63.56467316 39.99394166 0.478632787 0.229089345 18-07-2020 8.379909628 57.98574904 39.97525226 0.790372564 0.62468879 20-07-2020 12.70629128 60.07542579 39.98225268 0.682201716 0.465399182 21-07-2020 18.49965254 64.36865879 39.99663501 0.537469776 0.28887376 22-07-2020 14.67292318 59.18526243 39.97728579 0.443768575 0.40067219 23-07-2020 12.36862265 58.59277276 39.97728579 0.443768575 0.196930548 24-07-2020 14.68682656 63.72019465 39.97828819	11-07-2020	18.5266087	62.35408696	39.98988619	0.536717644	0.288065829
14-07-2020 19.66620306 61.81571627 39.98808265 0.508198399 0.258265613 15-07-2020 20.32036136 62.90826963 39.9917427 0.491886075 0.241951911 16-07-2020 30.53284672 62.3274244 39.98979687 0.236484076 0.055924718 17-07-2020 20.8515299 63.56467316 39.99394166 0.478632787 0.229089345 18-07-2020 8.379909628 57.98574904 39.97525226 0.790372564 0.62468879 19-07-2020 12.70629128 60.07542579 39.98225268 0.682201716 0.465399182 20-07-2020 12.849965254 64.36865879 39.99663501 0.537469776 0.28887376 22-07-2020 14.67292318 59.18526243 39.97728579 0.443768575 0.196930548 24-07-2020 11.93884642 57.28005559 39.97288819 0.7013264 0.491858719 25-07-2020 14.68682656 63.72019465 39.99446265 0.6327785 0.40040863 26-07-2020 19.63955509 62.17309698 39.99727865 <	12-07-2020	9.557678944	71.97567755	40.02211852	0.761190079	0.579410337
15-07-2020 20.32036136 62.90826963 39.9917427 0.491886075 0.241951911 16-07-2020 30.53284672 62.3274244 39.98979687 0.236484076 0.055924718 17-07-2020 20.8515299 63.56467316 39.99394166 0.478632787 0.229089345 18-07-2020 8.379909628 57.98574904 39.97525226 0.790372564 0.62468879 19-07-2020 12.70629128 60.07542579 39.98225268 0.682201716 0.465399182 20-07-2020 20.08133472 66.39346542 40.00341811 0.498009528 0.24801349 21-07-2020 18.49965254 64.36865879 39.99663501 0.537469776 0.28887376 22-07-2020 14.67292318 59.18526243 39.97728579 0.443768575 0.196930548 24-07-2020 11.93884642 57.28005559 39.97288819 0.7013264 0.491858719 25-07-2020 14.68682656 63.72019465 39.99446265 0.6327785 0.40040863 27-07-2020 22.4923558 58.8533704 39.97815879 0	13-07-2020	9.504517026	59.6542738	39.98084182	0.762273214	0.581060453
16-07-2020 30.53284672 62.3274244 39.98979687 0.236484076 0.055924718 17-07-2020 20.8515299 63.56467316 39.99394166 0.478632787 0.229089345 18-07-2020 8.379909628 57.98574904 39.97525226 0.790372564 0.62468879 19-07-2020 12.70629128 60.07542579 39.98225268 0.682201716 0.465399182 20-07-2020 20.08133472 66.39346542 40.00341811 0.498009528 0.24801349 21-07-2020 18.49965254 64.36865879 39.99663501 0.537469776 0.28887376 22-07-2020 14.67292318 59.18526243 39.97927063 0.632986722 0.40067219 23-07-2020 22.23662265 58.59277276 39.97728879 0.443768575 0.196930548 24-07-2020 11.93884642 57.28005559 39.97288819 0.7013264 0.491858719 25-07-2020 14.68682656 63.72019465 39.98927987 0.508879501 0.258958346 27-07-2020 22.4923558 58.8533704 39.97815879 <t< td=""><td>14-07-2020</td><td>19.66620306</td><td>61.81571627</td><td>39.98808265</td><td>0.508198399</td><td>0.258265613</td></t<>	14-07-2020	19.66620306	61.81571627	39.98808265	0.508198399	0.258265613
17-07-2020 20.8515299 63.56467316 39.99394166 0.478632787 0.229089345 18-07-2020 8.379909628 57.98574904 39.97525226 0.790372564 0.62468879 19-07-2020 12.70629128 60.07542579 39.98225268 0.682201716 0.465399182 20-07-2020 20.08133472 66.39346542 40.00341811 0.498009528 0.24801349 21-07-2020 18.49965254 64.36865879 39.99663501 0.537469776 0.28887376 22-07-2020 14.67292318 59.18526243 39.97927063 0.632986722 0.40067219 23-07-2020 22.23662265 58.59277276 39.97728579 0.443768575 0.196930548 24-07-2020 11.93884642 57.28005559 39.97288819 0.7013264 0.491858719 25-07-2020 14.68682656 63.72019465 39.99446265 0.6327785 0.40040863 26-07-2020 19.63955509 62.17309698 39.987815879 0.4373839 0.191304676 28-07-2020 31.20542231 58.11261731 39.97567727 <td< td=""><td>15-07-2020</td><td>20.32036136</td><td>62.90826963</td><td>39.9917427</td><td>0.491886075</td><td>0.241951911</td></td<>	15-07-2020	20.32036136	62.90826963	39.9917427	0.491886075	0.241951911
18-07-2020 8.379909628 57.98574904 39.97525226 0.790372564 0.62468879 19-07-2020 12.70629128 60.07542579 39.98225268 0.682201716 0.465399182 20-07-2020 20.08133472 66.39346542 40.00341811 0.498009528 0.24801349 21-07-2020 18.49965254 64.36865879 39.99663501 0.537469776 0.28887376 22-07-2020 14.67292318 59.18526243 39.97927063 0.632986722 0.40067219 23-07-2020 22.23662265 58.59277276 39.97728579 0.443768575 0.196930548 24-07-2020 11.93884642 57.28005559 39.97288819 0.7013264 0.491858719 25-07-2020 14.68682656 63.72019465 39.99446265 0.6327785 0.40040863 26-07-2020 19.63955509 62.17309698 39.98927987 0.508879501 0.258958346 27-07-2020 22.4923558 58.8533704 39.97815879 0.4373839 0.191304676 28-07-2020 37.98957609 65.54586518 40.00057865 0.050274337 0.002527509 30-07-2020 21.90852174	16-07-2020	30.53284672	62.3274244	39.98979687	0.236484076	0.055924718
19-07-2020 12.70629128 60.07542579 39.98225268 0.682201716 0.465399182 20-07-2020 20.08133472 66.39346542 40.00341811 0.498009528 0.24801349 21-07-2020 18.49965254 64.36865879 39.99663501 0.537469776 0.28887376 22-07-2020 14.67292318 59.18526243 39.97927063 0.632986722 0.40067219 23-07-2020 22.23662265 58.59277276 39.97728579 0.443768575 0.196930548 24-07-2020 11.93884642 57.28005559 39.97288819 0.7013264 0.491858719 25-07-2020 14.68682656 63.72019465 39.99446265 0.6327785 0.40040863 26-07-2020 19.63955509 62.17309698 39.98927987 0.508879501 0.258958346 27-07-2020 22.4923558 58.8533704 39.97815879 0.4373839 0.191304676 28-07-2020 31.20542231 58.11261731 39.97567727 0.219389778 0.048131875 29-07-2020 37.98957609 65.54586518 40.00057865 0.050274337 0.002527509 31-07-2020 20.52	17-07-2020	20.8515299	63.56467316	39.99394166	0.478632787	0.229089345
20-07-2020 20.08133472 66.39346542 40.00341811 0.498009528 0.24801349 21-07-2020 18.49965254 64.36865879 39.99663501 0.537469776 0.28887376 22-07-2020 14.67292318 59.18526243 39.97927063 0.632986722 0.40067219 23-07-2020 22.23662265 58.59277276 39.97728579 0.443768575 0.196930548 24-07-2020 11.93884642 57.28005559 39.97288819 0.7013264 0.491858719 25-07-2020 14.68682656 63.72019465 39.99446265 0.6327785 0.40040863 26-07-2020 19.63955509 62.17309698 39.98927987 0.508879501 0.258958346 27-07-2020 22.4923558 58.8533704 39.97815879 0.4373839 0.191304676 28-07-2020 31.20542231 58.11261731 39.97567727 0.219389778 0.048131875 29-07-2020 37.98957609 65.54586518 40.00057865 0.050274337 0.002527509 30-07-2020 21.90852174 60.48869565 39.98363713 0.452062811 0.204360785 31-07-2020 20.52	18-07-2020	8.379909628	57.98574904	39.97525226	0.790372564	0.62468879
21-07-2020 18.49965254 64.36865879 39.99663501 0.537469776 0.28887376 22-07-2020 14.67292318 59.18526243 39.97927063 0.632986722 0.40067219 23-07-2020 22.23662265 58.59277276 39.97728579 0.443768575 0.196930548 24-07-2020 11.93884642 57.28005559 39.97288819 0.7013264 0.491858719 25-07-2020 14.68682656 63.72019465 39.99446265 0.6327785 0.40040863 26-07-2020 19.63955509 62.17309698 39.98927987 0.508879501 0.258958346 27-07-2020 22.4923558 58.8533704 39.97815879 0.4373839 0.191304676 28-07-2020 31.20542231 58.11261731 39.97567727 0.219389778 0.048131875 29-07-2020 37.98957609 65.54586518 40.00057865 0.050274337 0.002527509 30-07-2020 21.90852174 60.48869565 39.98363713 0.452062811 0.204360785 31-07-2020 20.52 56.6306087 39.97071254 0.486624113 0.236803027 01-08-2020 15.99131341	19-07-2020	12.70629128	60.07542579	39.98225268	0.682201716	0.465399182
22-07-2020 14.67292318 59.18526243 39.97927063 0.632986722 0.40067219 23-07-2020 22.23662265 58.59277276 39.97728579 0.443768575 0.196930548 24-07-2020 11.93884642 57.28005559 39.97288819 0.7013264 0.491858719 25-07-2020 14.68682656 63.72019465 39.99446265 0.6327785 0.40040863 26-07-2020 19.63955509 62.17309698 39.98927987 0.508879501 0.258958346 27-07-2020 22.4923558 58.8533704 39.97815879 0.4373839 0.191304676 28-07-2020 31.20542231 58.11261731 39.97567727 0.219389778 0.048131875 29-07-2020 37.98957609 65.54586518 40.00057865 0.050274337 0.002527509 30-07-2020 21.90852174 60.48869565 39.98363713 0.452062811 0.204360785 31-07-2020 20.52 56.6306087 39.98387754 0.600055963 0.360067158 02-08-2020 25.65380605 60.26590198 39.98289077 0.358380408 0.128436517 03-08-2020 20.91657977 <td< td=""><td>20-07-2020</td><td>20.08133472</td><td>66.39346542</td><td>40.00341811</td><td>0.498009528</td><td>0.24801349</td></td<>	20-07-2020	20.08133472	66.39346542	40.00341811	0.498009528	0.24801349
23-07-2020 22.23662265 58.59277276 39.97728579 0.443768575 0.196930548 24-07-2020 11.93884642 57.28005559 39.97288819 0.7013264 0.491858719 25-07-2020 14.68682656 63.72019465 39.99446265 0.6327785 0.40040863 26-07-2020 19.63955509 62.17309698 39.98927987 0.508879501 0.258958346 27-07-2020 22.4923558 58.8533704 39.97815879 0.4373839 0.191304676 28-07-2020 31.20542231 58.11261731 39.97567727 0.219389778 0.048131875 29-07-2020 37.98957609 65.54586518 40.00057865 0.050274337 0.002527509 30-07-2020 21.90852174 60.48869565 39.98363713 0.452062811 0.204360785 31-07-2020 20.52 56.6306087 39.98387754 0.600055963 0.360067158 02-08-2020 25.65380605 60.26590198 39.98289077 0.358380408 0.128436517 03-08-2020 20.91657977 70.81786583 40.01823985 0.477323844 0.227838052	21-07-2020	18.49965254	64.36865879	39.99663501	0.537469776	0.28887376
24-07-2020 11.93884642 57.28005559 39.97288819 0.7013264 0.491858719 25-07-2020 14.68682656 63.72019465 39.99446265 0.6327785 0.40040863 26-07-2020 19.63955509 62.17309698 39.98927987 0.508879501 0.258958346 27-07-2020 22.4923558 58.8533704 39.97815879 0.4373839 0.191304676 28-07-2020 31.20542231 58.11261731 39.97567727 0.219389778 0.048131875 29-07-2020 37.98957609 65.54586518 40.00057865 0.050274337 0.002527509 30-07-2020 21.90852174 60.48869565 39.98363713 0.452062811 0.204360785 31-07-2020 20.52 56.6306087 39.997071254 0.486624113 0.236803027 01-08-2020 15.99131341 60.56045865 39.98387754 0.600055963 0.360067158 02-08-2020 25.65380605 60.26590198 39.98289077 0.358380408 0.128436517 03-08-2020 20.91657977 70.81786583 40.01823985 0.477323844 0.227838052	22-07-2020	14.67292318	59.18526243	39.97927063	0.632986722	0.40067219
25-07-2020 14.68682656 63.72019465 39.99446265 0.6327785 0.40040863 26-07-2020 19.63955509 62.17309698 39.98927987 0.508879501 0.258958346 27-07-2020 22.4923558 58.8533704 39.97815879 0.4373839 0.191304676 28-07-2020 31.20542231 58.11261731 39.97567727 0.219389778 0.048131875 29-07-2020 37.98957609 65.54586518 40.00057865 0.050274337 0.002527509 30-07-2020 21.90852174 60.48869565 39.98363713 0.452062811 0.204360785 31-07-2020 20.52 56.6306087 39.97071254 0.486624113 0.236803027 01-08-2020 15.99131341 60.56045865 39.98387754 0.600055963 0.360067158 02-08-2020 25.65380605 60.26590198 39.98289077 0.358380408 0.128436517 03-08-2020 20.91657977 70.81786583 40.01823985 0.477323844 0.227838052	23-07-2020	22.23662265	58.59277276	39.97728579	0.443768575	0.196930548
26-07-2020 19.63955509 62.17309698 39.98927987 0.508879501 0.258958346 27-07-2020 22.4923558 58.8533704 39.97815879 0.4373839 0.191304676 28-07-2020 31.20542231 58.11261731 39.97567727 0.219389778 0.048131875 29-07-2020 37.98957609 65.54586518 40.00057865 0.050274337 0.002527509 30-07-2020 21.90852174 60.48869565 39.98363713 0.452062811 0.204360785 31-07-2020 20.52 56.6306087 39.97071254 0.486624113 0.236803027 01-08-2020 15.99131341 60.56045865 39.98387754 0.600055963 0.360067158 02-08-2020 25.65380605 60.26590198 39.98289077 0.358380408 0.128436517 03-08-2020 20.91657977 70.81786583 40.01823985 0.477323844 0.227838052	24-07-2020	11.93884642	57.28005559	39.97288819	0.7013264	0.491858719
27-07-2020 22.4923558 58.8533704 39.97815879 0.4373839 0.191304676 28-07-2020 31.20542231 58.11261731 39.97567727 0.219389778 0.048131875 29-07-2020 37.98957609 65.54586518 40.00057865 0.050274337 0.002527509 30-07-2020 21.90852174 60.48869565 39.98363713 0.452062811 0.204360785 31-07-2020 20.52 56.6306087 39.97071254 0.486624113 0.236803027 01-08-2020 15.99131341 60.56045865 39.98387754 0.600055963 0.360067158 02-08-2020 25.65380605 60.26590198 39.98289077 0.358380408 0.128436517 03-08-2020 20.91657977 70.81786583 40.01823985 0.477323844 0.227838052	25-07-2020	14.68682656	63.72019465	39.99446265	0.6327785	0.40040863
28-07-2020 31.20542231 58.11261731 39.97567727 0.219389778 0.048131875 29-07-2020 37.98957609 65.54586518 40.00057865 0.050274337 0.002527509 30-07-2020 21.90852174 60.48869565 39.98363713 0.452062811 0.204360785 31-07-2020 20.52 56.6306087 39.97071254 0.486624113 0.236803027 01-08-2020 15.99131341 60.56045865 39.98387754 0.600055963 0.360067158 02-08-2020 25.65380605 60.26590198 39.98289077 0.358380408 0.128436517 03-08-2020 20.91657977 70.81786583 40.01823985 0.477323844 0.227838052	26-07-2020	19.63955509	62.17309698	39.98927987	0.508879501	0.258958346
29-07-2020 37.98957609 65.54586518 40.00057865 0.050274337 0.002527509 30-07-2020 21.90852174 60.48869565 39.98363713 0.452062811 0.204360785 31-07-2020 20.52 56.6306087 39.97071254 0.486624113 0.236803027 01-08-2020 15.99131341 60.56045865 39.98387754 0.600055963 0.360067158 02-08-2020 25.65380605 60.26590198 39.98289077 0.358380408 0.128436517 03-08-2020 20.91657977 70.81786583 40.01823985 0.477323844 0.227838052	27-07-2020	22.4923558	58.8533704	39.97815879	0.4373839	0.191304676
30-07-2020 21.90852174 60.48869565 39.98363713 0.452062811 0.204360785 31-07-2020 20.52 56.6306087 39.97071254 0.486624113 0.236803027 01-08-2020 15.99131341 60.56045865 39.98387754 0.600055963 0.360067158 02-08-2020 25.65380605 60.26590198 39.98289077 0.358380408 0.128436517 03-08-2020 20.91657977 70.81786583 40.01823985 0.477323844 0.227838052	28-07-2020	31.20542231	58.11261731	39.97567727	0.219389778	0.048131875
31-07-2020 20.52 56.6306087 39.97071254 0.486624113 0.236803027 01-08-2020 15.99131341 60.56045865 39.98387754 0.600055963 0.360067158 02-08-2020 25.65380605 60.26590198 39.98289077 0.358380408 0.128436517 03-08-2020 20.91657977 70.81786583 40.01823985 0.477323844 0.227838052	29-07-2020	37.98957609	65.54586518	40.00057865	0.050274337	0.002527509
01-08-2020 15.99131341 60.56045865 39.98387754 0.600055963 0.360067158 02-08-2020 25.65380605 60.26590198 39.98289077 0.358380408 0.128436517 03-08-2020 20.91657977 70.81786583 40.01823985 0.477323844 0.227838052	30-07-2020	21.90852174	60.48869565	39.98363713	0.452062811	0.204360785
02-08-2020 25.65380605 60.26590198 39.98289077 0.358380408 0.128436517 03-08-2020 20.91657977 70.81786583 40.01823985 0.477323844 0.227838052	31-07-2020	20.52	56.6306087	39.97071254	0.486624113	0.236803027
03-08-2020 20.91657977 70.81786583 40.01823985 0.477323844 0.227838052	01-08-2020	15.99131341	60.56045865	39.98387754	0.600055963	0.360067158
	02-08-2020	25.65380605	60.26590198	39.98289077	0.358380408	0.128436517
04-08-2020 19.44614315 70.56219597 40.01738336 0.514057604 0.26425522	03-08-2020	20.91657977	70.81786583	40.01823985	0.477323844	0.227838052
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	04-08-2020	19.44614315	70.56219597	40.01738336	0.514057604	0.26425522
05-08-2020 19.50729672 67.91973593 40.00853112 0.512421572 0.262575867	05-08-2020	19.50729672	67.91973593	40.00853112	0.512421572	0.262575867

06-08-2020	13.46226087	68.45217391	40.01031478	0.663530244	0.440272384
07-08-2020	9.569725421	72.1438999	40.02268206	0.760892451	0.578957322
08-08-2020	11.61737318	72.31688673	40.02326157	0.709734471	0.50372302
09-08-2020	4.764186371	69.57753825	40.01408475	0.880937265	0.776050465
10-08-2020	12.78484005	69.80980529	40.01486285	0.680497716	0.463077142
11-08-2020	25.86714184	76.68671766	40.0379005	0.35393361	0.125269
12-08-2020	7.849235042	71.2701669	40.01975506	0.80386599	0.64620053
13-08-2020	1.498054203	77.38985407	40.04025601	0.962586298	0.926572381
14-08-2020	1.279999998	72.18434783	40.02281757	0.968018244	0.93705932
15-08-2020	2.893326381	71.31803962	40.01991543	0.927702836	0.860632552
16-08-2020	6.555076495	66.79346314	40.0047581	0.836142579	0.699134412
17-08-2020	10.58353023	71.33912439	40.01998607	0.73554388	0.5410248
18-08-2020	13.42444367	75.17002782	40.03281959	0.664664048	0.441778297
19-08-2020	7.816052821	74.36101459	40.0301094	0.804745654	0.647615568
20-08-2020	11.04035454	70.53632256	40.01729668	0.724110436	0.524335923
21-08-2020	9.668682649	79.27250608	40.0465629	0.758563983	0.575419316
22-08-2020	1.202712101	94.26738526	40.09679574	0.970004783	0.940909278
23-08-2020	1.249391726	85.46159194	40.06729633	0.968817668	0.938607674
24-08-2020	5.74659486	74.51737318	40.0306332	0.856445067	0.733498153
25-08-2020	8.564650683	72.5950643	40.02419347	0.78601316	0.617816688
26-08-2020	14.57940257	64.72282042	39.99782145	0.635495083	0.403854001
27-08-2020	17.53531457	73.83350713	40.02834225	0.561927535	0.315762554
28-08-2020	18.98217889	86.20361991	40.06978213	0.526271972	0.276962188
29-08-2020	5.869318962	96.86970118	40.1055135	0.853653065	0.728723556
30-08-2020	0.449878261	80.25565217	40.04985643	0.988767044	0.977660268
31-08-2020	5.081584431	70.27275886	40.01641374	0.873012498	0.762150821
				Sum of z^2 =	33.22317632
			l.		

normalize error = sq. root of (33.22317632)

Q6.

Let x1=RH, x2=Temperature, y=PM2.5 & a,b,c be constants.

So, our linear regression equation would be

$$y = a*x1 + b*x2 + c$$

Now,

Mean of x1 = 10413.11/244 = 42.67

Mean of x2 = 6909.128/244 = 28.31

Mean of y = 7838.098/244 = 32.12

 $Sx1 = (566863.9 - (10413.11^2)/244)/244 = 501.91$

 $Sx2 = (216368.7 - (6909.128^2)/244)/244 = 84.95$

Sx1y = (353268.2 - (10413.11*7838.098)/244)/244 = 76.90

Sx2y = (216126.1 - (6909.128*7838.098)/244)/244 = -23.84

Sx1x2 = (303807.7 - (10413.11*6909.128)/244)/244 = 36.67

We know that,

 $a = (Sx2*Sx1y - Sx1x2*Sx2y)/(Sx1*Sx2-(Sx1x2^2))$

 $= (84.95*76.90-36.67*(-23.84))/(501.91*84.95-(36.67^2))$

= 0.179

 $b = (Sx1*Sx2y - Sx1x2*Sx1y)/(Sx1*Sx2-(Sx1x2^2))$

 $= (501.91*(-23.84)-36.67*76.9)/(501.91*84.95-(36.67^2))$

= -0.358

c= 32.12 - 0.179*42.67 + 0.358*28.31

= 34.617

Therefore, our linear regression equation is

$$y = 0.179*x1 - 0.358*x2 + 34.617$$
.

Q7.

Hypothesis Test:

Ho: No relation between x and y (in question $5 \times 1 = 100$ x is RH and in question $6 \times 1 = 100$ km and x is temperature and y is same in both i.e. PM2.5)

Ha: there exist relation between x and y.

In Q.6 P value is very close to zero and r value is high which signifies that Ho is false and Ha is true hence there is significant relation between PM 2.5 and RH, Temperature.

In Q.5 P value is small but r value is less which means relation between PM2.5 and RH is weak , hence Ho holds true.

Hence Q.6 regression is is very suitable for determining PM2.5 from temperature and RH as compared to Q5.