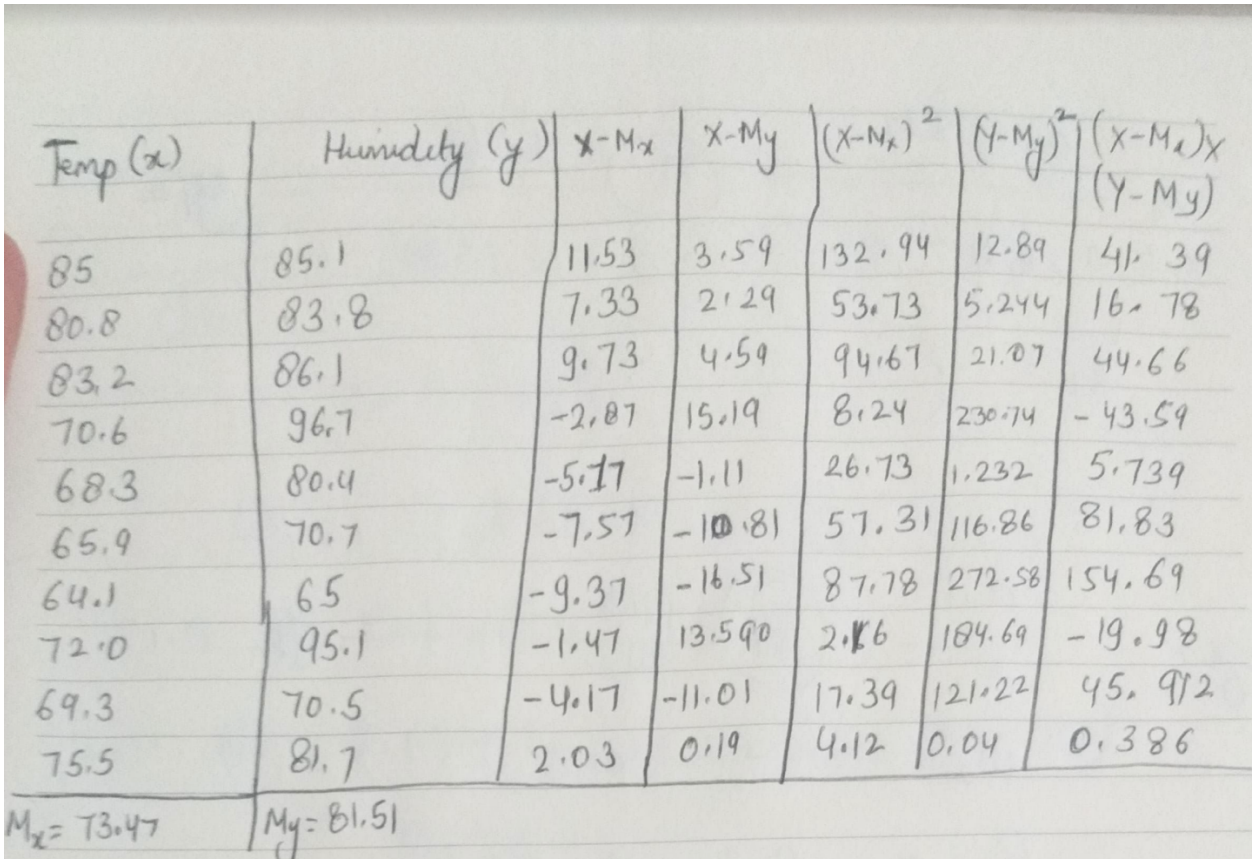
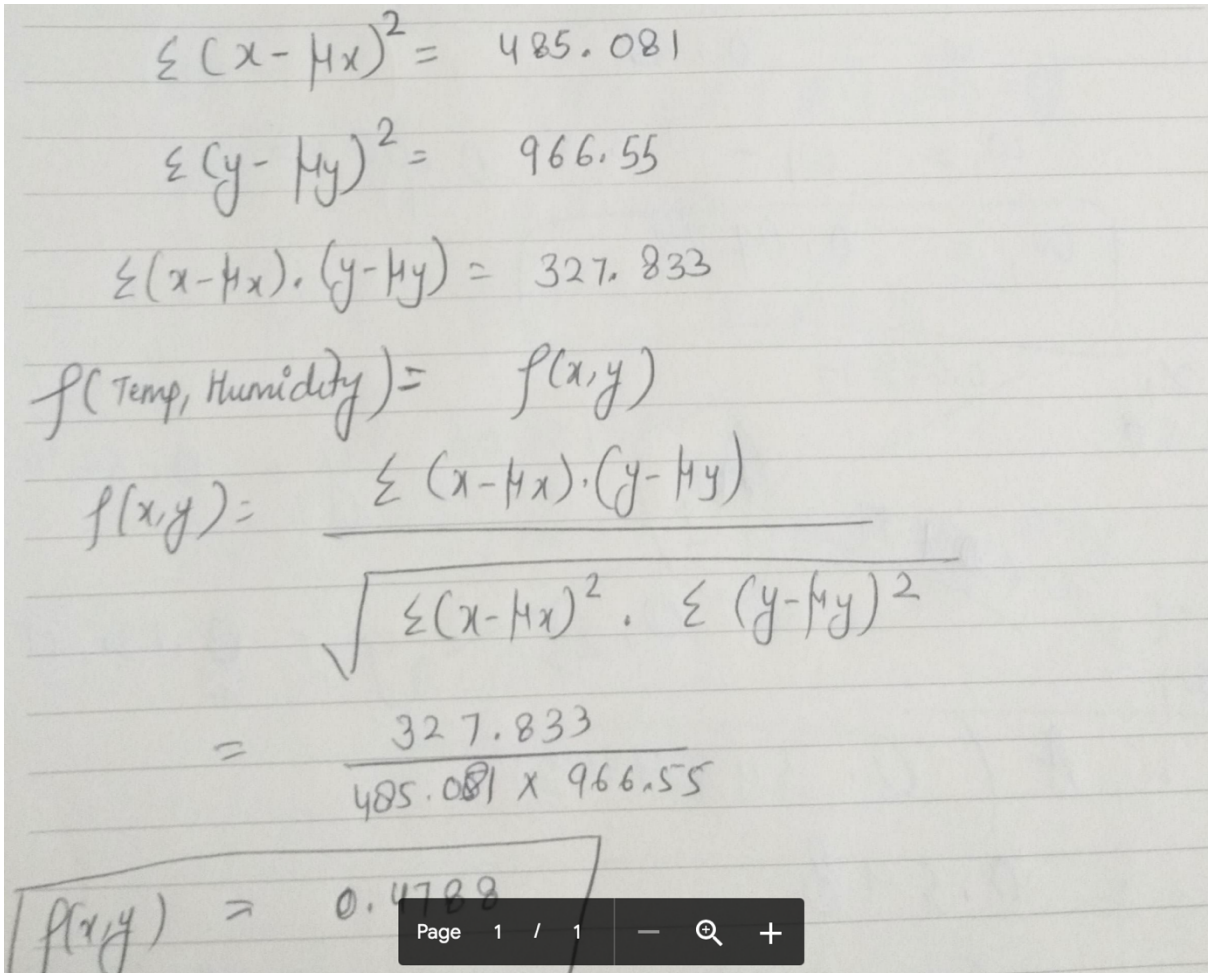
A) Given the following data calculate the Pearson Correlation

Temp	Humidity
85.0	85.1
80.8	83.8
83.2	86.1
70.6	96.7
68.3	80.4
65.9	70.7
64.1	65.0
72.0	95.1
69.3	70.5
75.5	81.7

SOLUTION:



Temp (x)	Humidity (y)	x-Mx	x-My	$(x-M_x)^2$	$(y-M_y)^2$	$(x-M_x)(y-M_y)$
85	85.1	11.53	3.59	132.94	12.89	41.39
80.8	83.8	7.33	2.29	53.73	5.244	16.78
83.2	86.1	9.73	4.59	94.67	21.07	44.66
70.6	96.7	-2.87	15.19	8.24	230.74	-43.59
68.3	80.4	-5.17	-1.11	26.73	1.232	5.739
65.9	70.7	-7.57	-10.81	57.31	116.86	81.83
64.1	65	-9.37	-16.51	87.78	272.58	154.69
72.0	95.1	-1.47	13.590	2.16	184.69	-19.98
69.3	70.5	-4.17	-11.01	17.39	121.22	45.912
75.5	81.7	2.03	0.19	4.12	0.04	0.386
$M_x = 73.47$	$M_y = 81.51$					

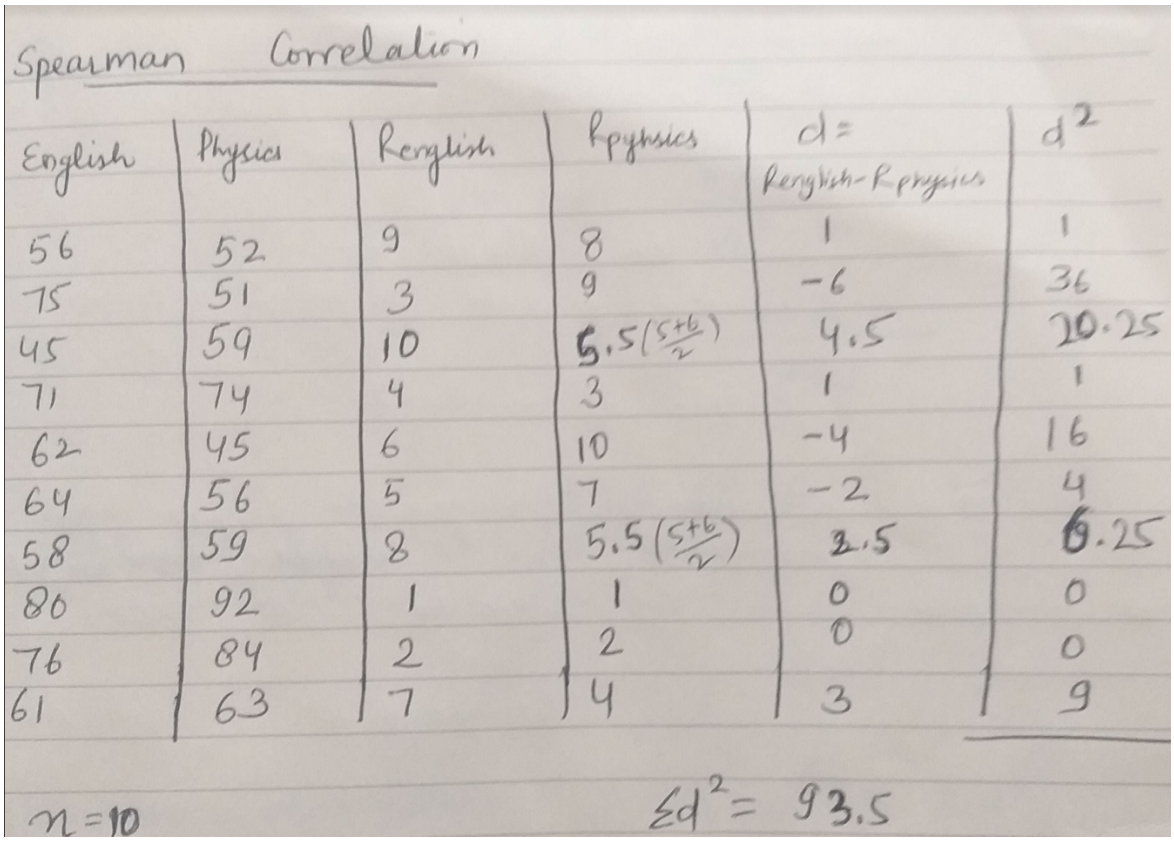


Pearson Correlation=0.4788

B) Given the following student data calculate the Spearman Correlation

Exam	**Marks**									
English	56	75	45	71	62	64	58	80	76	61
Physics	52	51	59	74	45	56	59	92	84	63

SOLUTION:



Spearman Correlation

English	Physics	Renglish	Rphysics	d = Renglish − Rphysics	d^2
56	52	9	8	1	1
75	51	3	9	−6	36
45	59	10	5.5 $(\frac{5+6}{2})$	4.5	20.25
71	74	4	3	1	1
62	45	6	10	−4	16
64	56	5	7	−2	4
58	59	8	5.5 $(\frac{5+6}{2})$	2.5	6.25
80	92	1	1	0	0
76	84	2	2	0	0
61	63	7	4	3	9

$n = 10$ $\quad \Sigma d^2 = 93.5$

Spearman Correlation = $1 - \left(\frac{6 \times \Sigma d^2}{n^3 - n}\right)$

$= 1 - \frac{6 \times 93.5}{10^3 - 10}$

$= 1 - \frac{561}{990}$

$= 1 - 0.5666$

$\rho(\text{English, Physics}) = 0.433$