



**Faculty of Engineering and Technology**

**Department of Electrical and Computer Engineering**

**Statistics about students' activities on Facebook**

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# Data Collection

i	Time in hours since the post has been published or shared (T)	Number of Likes (L)	Number of Comments (C)	Number of Shares (S)
1	58853	96	186	15
2	50587	0	0	0
3	49002	157	35	2
4	47349	0	0	0
5	46195	41	20	1
6	44854	11	0	0
7	44600	14	0	0
8	44568	20	3	0
9	44467	19	4	1
10	43321	13	0	1
11	43321	21	2	0
12	43120	16	1	1
13	43016	21	2	1
14	42340	7	6	0
15	41481	20	2	0
16	41118	70	21	0
17	41095	19	2	0
18	41095	31	5	0
19	41047	28	15	0
20	40886	2	1	0
21	40885	2	1	0
22	40856	2	3	0

23	40804	36	9	0
24	40387	19	0	0
25	40227	18	0	0
26	39949	16	1	0
27	39924	16	0	1
28	39731	18	1	0
29	39654	18	0	2
30	39460	26	7	0
31	39273	17	6	0
32	39168	21	0	1
33	39128	31	4	0
34	39073	24	1	0
35	38958	41	27	0
36	38878	27	0	0
37	38709	41	3	0
38	38698	27	0	1
39	38527	29	11	0
40	38514	27	5	0
41	38451	23	0	0
42	38447	26	0	0
43	38427	28	1	0
44	38353	26	3	0
45	38328	34	0	0
46	38288	29	24	0
47	38241	27	6	0
48	38221	41	12	0
49	38209	24	0	0

50	38170	23	9	0
51	38158	38	4	0
52	38145	43	31	0
53	38097	33	3	0
54	38096	42	2	0
55	38045	50	13	0
56	38019	31	0	0
57	37896	26	0	0
58	37881	25	0	0
59	37763	39	5	0
60	37757	39	23	0
61	37750	24	0	0
62	37718	30	3	0
63	37714	39	8	1
64	37616	24	3	0
65	37592	43	27	0
66	37586	23	2	0
67	37584	3	6	0
68	37379	44	5	0
69	37372	35	0	0
70	37282	58	49	0
71	37209	29	3	0
72	37088	35	0	0
73	37062	27	0	0
74	36845	36	7	0
75	36562	23	0	0
76	36514	29	0	0

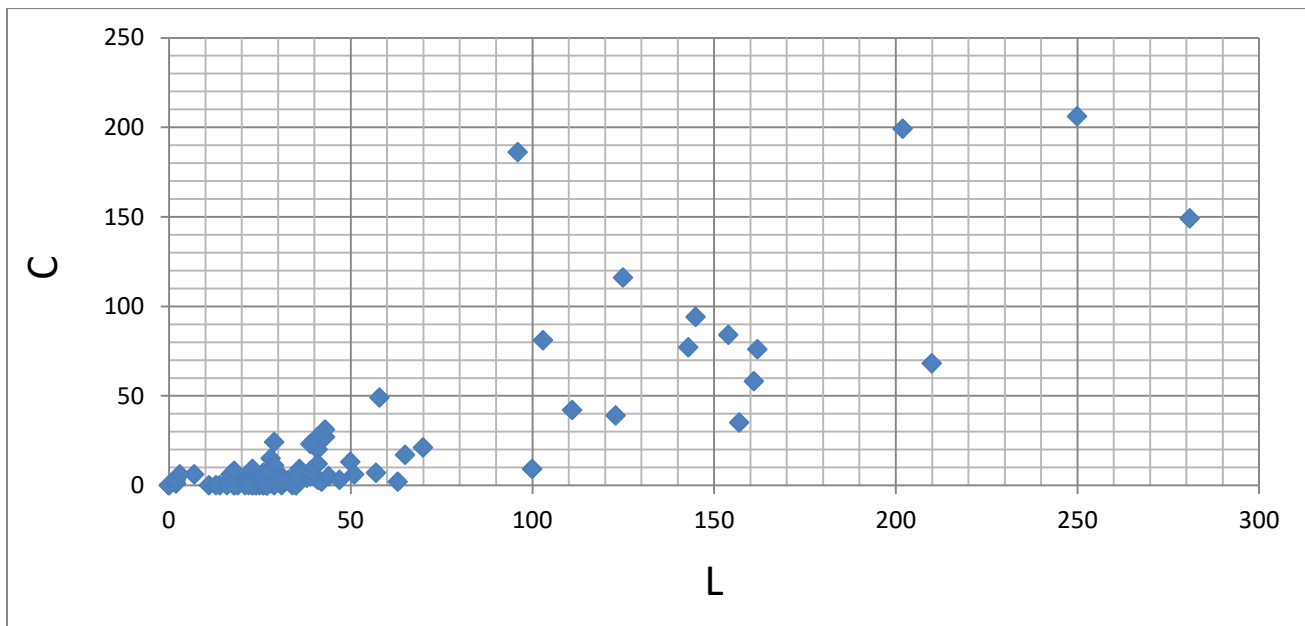
77	36243	22	0	0
78	36149	35	4	0
79	35766	27	0	0
80	35577	143	77	0
81	35285	32	2	0
82	34500	47	3	0
83	34497	51	6	0
84	34445	63	2	0
85	33699	100	9	0
86	33436	65	17	1
87	29917	145	94	0
88	28041	57	7	0
89	21275	18	8	0
90	14503	123	39	0
91	14501	125	116	0
92	12729	103	81	1
93	10667	111	42	0
94	10565	162	76	0
95	10534	154	84	1
96	7828	202	199	0
97	4108	281	149	0
98	3508	161	58	0
99	1802	210	68	0
100	491	250	206	1

# Computing Statistics

Calculating the sample mean & the sample variance of each of the random variables

	T	L	C	S
Sample Mean	35630.49	48.98	19.8	0.32
Standard Deviation	10658.74642	53.69987	41.24796	1.543183
Sample variance	113608875.3	2883.676	1701.394	2.381414

The relation between Random Variables  
L (number of like) and C (number of comments)



The correlation coefficient between these two random variables

$$\rho_{LC} = M_{LC}/\sigma_L * \sigma_c = 0.843417 \text{ (With Excel)}$$

The best fitting line of the points  $\langle L_i, C_i \rangle$

Assume this equation ,

$$C(L_i) = \alpha L_i + \beta$$

To find the cost function ,

$$\epsilon = (1/n-1) \sum (C_i - C(L_i))^2$$

Then we will derivative the cost function for  $\beta$  and for  $\alpha$  ,

$$\partial \epsilon / \partial \beta = 0$$

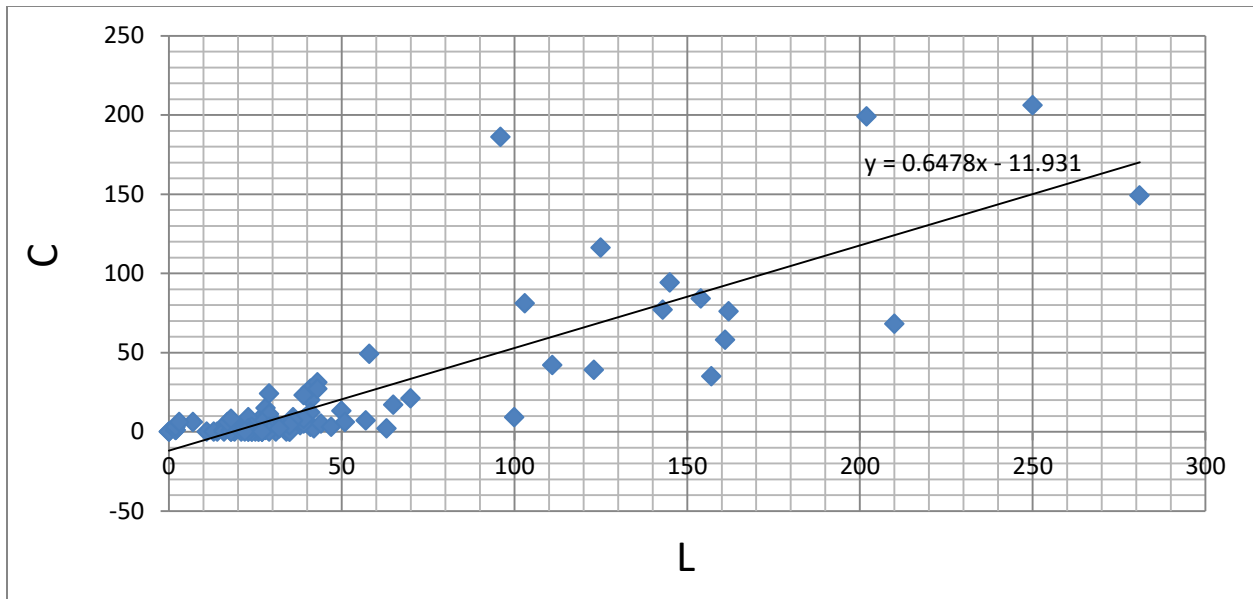
$$\sum C_i - \alpha \sum L_i - \sum \beta = 0 \dots\dots *$$

$$\partial \epsilon / \partial \alpha = 0$$

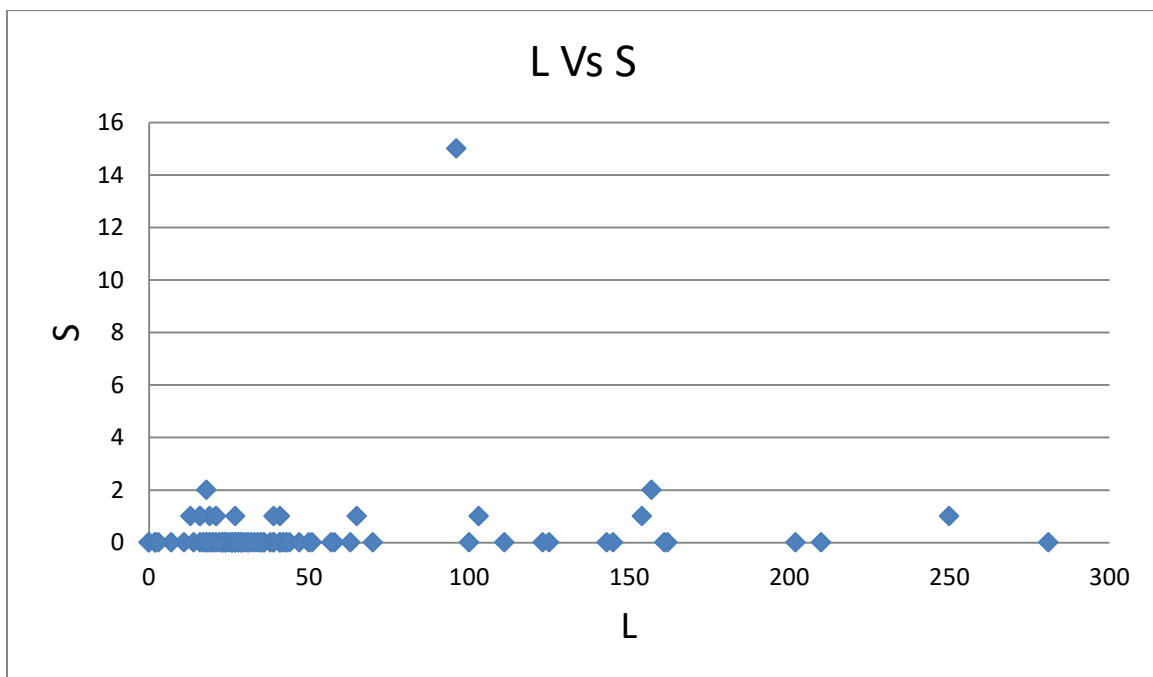
$$\sum L_i C_i - \alpha \sum L_i^2 - \beta \sum L_i = 0 \dots\dots *$$

We can solve these two equations to find  $\alpha$  and  $\beta$  , or by Excel .

$$C = 0.6478 L - 11.931$$



The relation between Random Variables L (number of like) and S (number of shares)



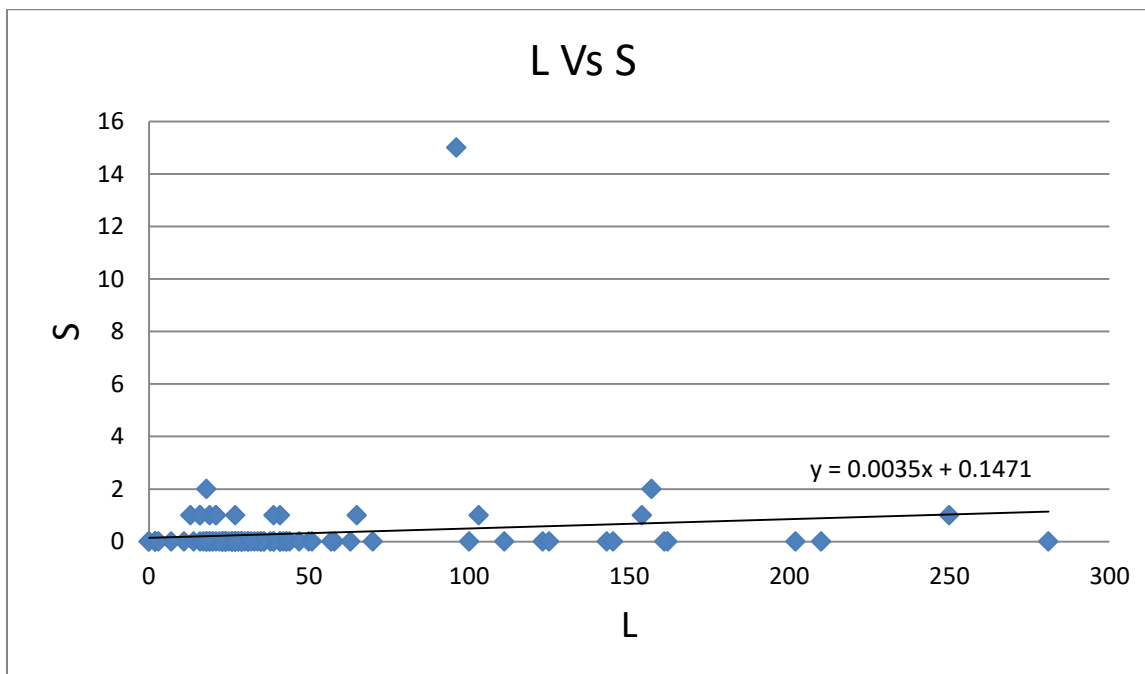


The correlation coefficient between these two random variables

$$\rho_{LS} = M_{LS}/\sigma_L * \sigma_S = 0.122823$$

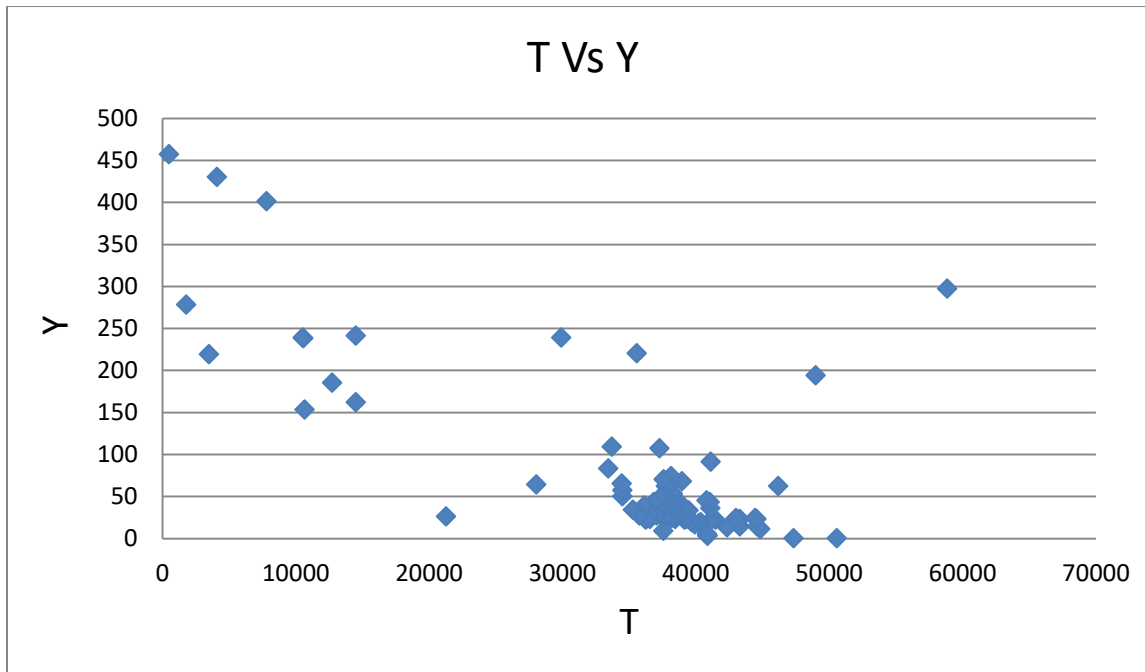
The best fitting line of the points <Li,Si>

$$S = 0.0035 L + 0.1471$$



The relation between Random Variables  
T (time passed since sharing the post) and Y (activities  
received for the post)

$$Y = L + C + S$$

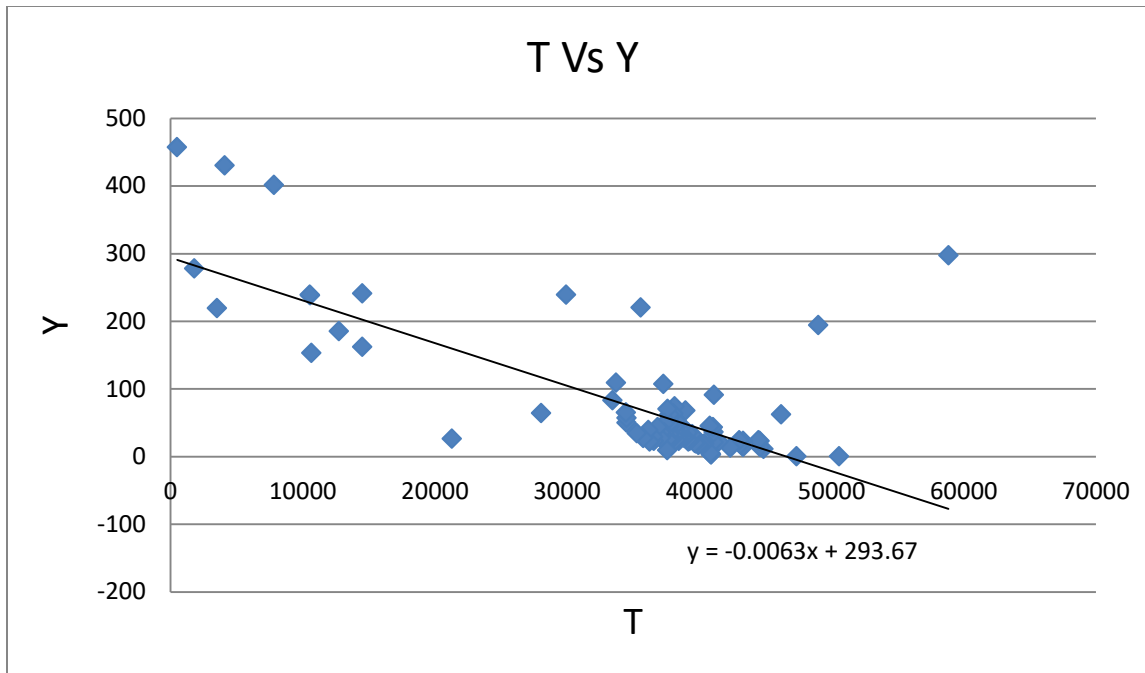


The correlation coefficient between  
these two random variables

$$\rho_{TY} = M_{TY}/\sigma_T * \sigma_Y = - 0.73309$$

The best fitting line of the points  $\langle T_i, Y_i \rangle$

$$Y = - 0.0063 T + 293.67$$



## Data Analysis

1- Is there a correlation between the random variables defined above?

No .

2- Do you get the same correlation value compared to the other students in your group?

No .

3- Does the best fit line represent accurately the relationship between the defined random variables?

No .