SOLUTION FOR HOMEWORK ASSIGNMENT NO. 11

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Exercise 11.1

a) Given a Poissonian distribution with mean ν

$$f_n(\nu) = e^{-n}\frac{n^\nu}{\nu!} \tag{1}$$

we are asked to list the number of observed events such that there is a $10\,\%$ chance to observe them above, below and outside of the central interval.
As usual, please find the code in file `exercise11_1a.C`. The results are given in table 1.

Exercise	ν	1	2	3	4	5	6	7	8	9	10	11	12
1	**n**	5	5	6	8	9	10	11	13	14	15	16	18
2		1	1	2	3	3	4	5	6	6	7	8	9
3	**n'**	1	1	2	2	3	3	4	5	5	6	7	8
	n	4	6	7	9	10	11	13	14	15	16	18	19

Table 1: Results obtained for a fixed mean ν.

b) Similar to the first part we are asked to calculatze the $90\,\%$ CL for ν given the total number of observed events n.
As usual, please find the code in file `exercise11_1b.C`. The results are given in table 2.

Exercise	n	0	1	2	3	4	5	6	7	8	9	10	11	12
1	ν	2.30	3.89	5.32	6.68	7.99	9.28	10.5	11.77	13.00	14.21	15.41	16.60	17.78
2		0.11	0.53	1.10	1.75	2.43	3.15	3.90	4.66	5.43	6.22	7.02	7.83	8.65
3	ν'	0.05	0.36	0.82	1.37	1.97	2.61	3.29	3.98	4.70	5.43	6.17	6.93	7.69
	ν	3.00	4.74	6.30	7.75	9.15	10.51	11.84	13.15	14.44	15.71	16.96	18.21	19.44

Table 2: Results obtained for a fixed number of events n.

Exercise 11.2