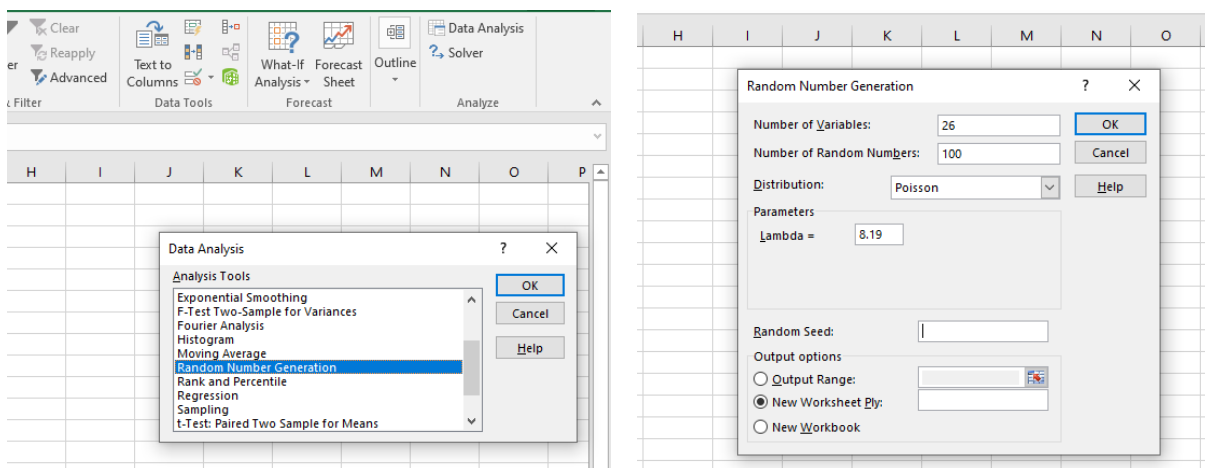
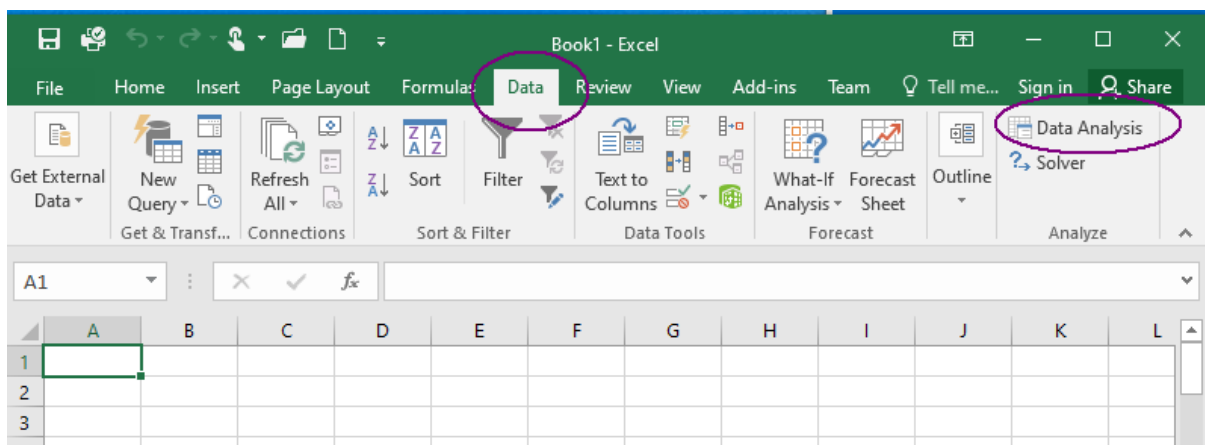


Problem 1: Use Microsoft Excel for steps 1, 2 and 3.

1. Use Data Analysis Add-ins tool to generate 2600 random variables distributed as Poisson with parameter λ . Parameter λ is in the form of N.nn where N is the largest digit of your student ID and nn is the day number of your birthday. The generated values must be in 100 rows (rows 1 through 100) and 26 columns (column A through Z). They must be with three decimal values.
2. For each row, calculate the average of the values in that row (in column AA).
3. Use these values in ARENA to find the distribution that is the best fit and report it. If that distribution is Normal, go to the next step, otherwise fit a normal distribution to the data and go to the next step.

Solution

Let us assume that $N = 8$ and $nn = 19$, then $\lambda = 8.19$. Using Excel, I will generate the required numbers.



2600 numbers are now generated from the desired distribution in 100 rows and 26 columns. For each row we will calculate the average (shown in bold in column AA). Copy the values of the column AA and paste them into a Notepad. Save this file as All Files/Mydata.dst. Lunch Rockville Software's Input Analyzer. Click on File and select New. After new file is opened, click on File/Data File/Use Existing. Select the dst file you just save and see the results.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA
1	7	4	8	8	8	8	5	14	9	6	13	6	7	9	6	6	5	8	7	6	7	7	8	14	7	10	7.808
2	8	8	7	12	3	11	9	9	10	9	8	6	10	10	8	8	8	6	9	10	8	5	7	10	7	8	8.231
3	7	11	9	8	12	5	7	8	6	9	12	10	5	12	6	13	10	6	4	7	11	7	10	13	8	11	8.731
4	10	10	7	7	8	9	6	11	17	6	3	8	8	4	6	10	13	9	10	10	8	4	9	8	7	6	8.231
5	9	10	8	11	10	9	11	16	15	7	0	8	3	7	9	7	8	8	9	9	9	8	8	4	8	10	8.500
6	3	6	11	5	4	7	11	5	11	8	8	8	12	6	6	11	7	6	3	8	7	7	5	10	6	8	7.269
7	4	7	9	9	4	10	7	10	10	6	10	6	10	5	9	12	4	5	1	3	7	3	5	4	13	17	7.308
8	4	15	9	6	7	9	3	5	8	5	6	15	9	8	10	10	7	13	10	6	16	6	8	6	3	8	8.154
9	6	6	14	9	5	6	6	6	4	10	12	8	6	10	9	9	13	8	4	11	16	2	7	11	11	12	8.500
10	13	9	9	5	9	7	10	10	8	7	5	8	7	5	8	10	6	12	2	11	11	9	7	8	8	9	8.192
11	10	3	9	8	10	6	11	17	5	10	12	7	12	14	6	10	11	7	6	10	7	7	4	5	7	4	8.385

assignment5 - Notepad

File Edit Format View Help

7.808
8.231
8.731
8.231
8.500
7.269
7.308
8.154
8.500
8.192
8.385
8.385
8.462
8.500
8.423
7.846
7.923

Save As

This PC > Documents

File name: assignment5

Save as type: All Files

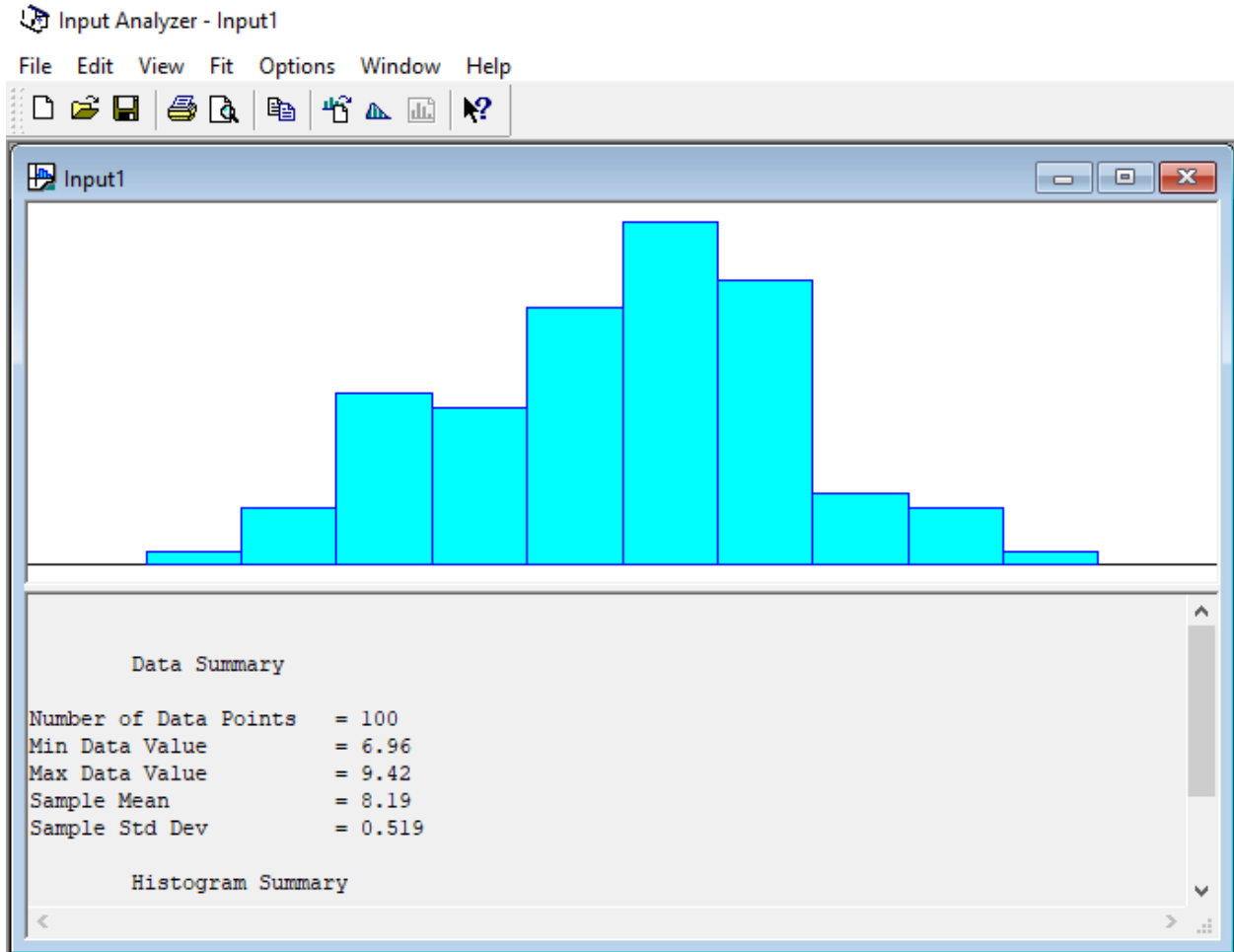
Encoding: UTF-8

Save Cancel

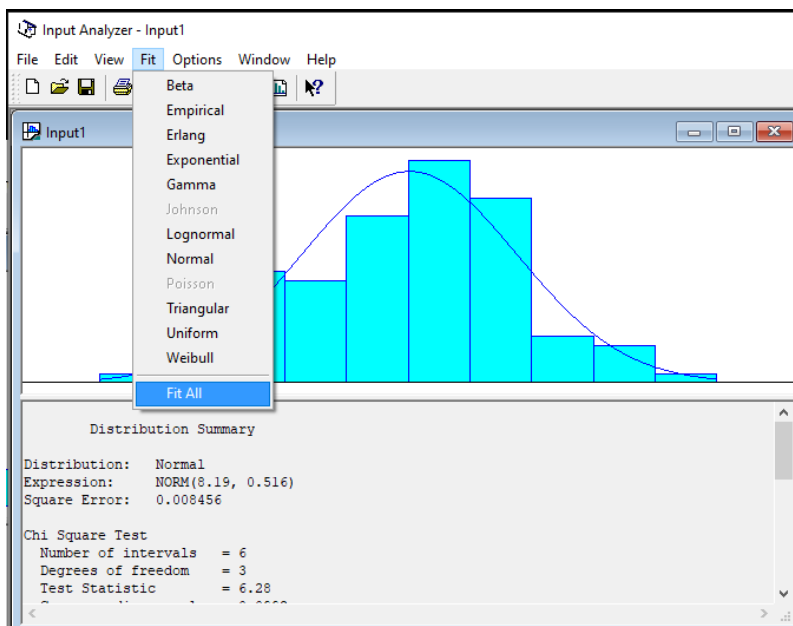
Input Analyzer - Input1

File Edit View Fit Options Window Help

- New Ctrl+N
- Open... Ctrl+O
- Close
- Save Ctrl+S
- Save As...
- Data File
 - Use Existing...
 - Generate New...
- Print Preview
- Print... Ctrl+P
- Print Setup...
- Send...
- 1 C:\Users\...\KHR06390\Input1
- 2 C:\Users\...\Documents\Input2
- Exit



Now, select Fit/Fit All and observe the distribution that fits the best. If that is not Normal distribution, repeat the Fit/Normal. Record the distribution which for this example is $N(8.19, 0.516)$.



4. Use the Normal distribution that you came up with and using standard normal tables find the

$$\Pr(\mu - 2\sigma \leq x \leq \mu + 2\sigma).$$

Now count the actual number of averages that fall into that range and find percentage of total. Are they very close or not?

Regardless of what the values of mean and standard deviations are, for a Normal distribution the area under the Normal distribution curve in the range of $\mu - 2\sigma$ to $\mu + 2\sigma$ is 0.95. For this problem, we have the estimate of $M = 8.19$ and variance of 0.516 or standard deviation of 0.718. Therefore, the range is between $8.19 - 2(0.718) = 6.753$ and $8.19 + 2(0.718) = 9.626$. By looking at the numbers used, I can see that all 100 numbers actually fit in this range.