Statistical analysis (MS Excel)

1. Enter the data: MURDER (murders per million residents), ROBBERY (robberies per million residents), POLICE (police employees per 100,000 population) for the 50 states that are presented on the attached page. Label the sheet DATA.

State Crime Data Set			
STATE	MURDER	POLICE	ROBBERY
AL	132	230	1321
AK	97	350	900
AZ	103	310	1936
AR	92	190	809
CA	143	270	3842
CO	69	270	1601
CT	47	260	2180
DE	69	280	1370
FL	145	300	3555
GA	138	240	1976
HI	87	290	1902
ID	31	240	468
IL	106	320	2170
IN	89	210	1414
IA	22	200	549
KS	69	230	1131
KY	88	200	952
LA	157	290	1970
ME	28	200	308
MD	95	310	3927
MA	41	290	2355
MI	102	250	2440
MN	26	190	991
MS	145	200	810

MO	111	280	2236
MT	40	240	340
NE	44	220	822
NV	20	360	4606
NH	25	240	420
NJ	69	350	3037
NM	131	280	1279
NY	127	370	6413
NC	106	220	823
ND	12	180	77
OH	81	210	2237
OK	51	230	1049
OR	51	240	1524
PA	68	240	1779
RI	44	280	1186
SC	114	240	1181
SD	7	200	201
TN	108	210	1806
TX	169	240	2085
UT	38	240	802
VT	22	200	389
VA	86	230	1201
WA	55	210	1351
WV	71	180	485
WI	29	240	707
WY	62	310	444

2. Calculate the variance for MURDER by breaking down the formula S(Xi-Xbar)2/(N-1), where Xbar is the mean, Xi is each case of the variables, and N is the number of cases. Enter the following labels in the appropriate cells. A54: **Mean =**
A55: **N =**
A57: **Variance=**
A58: **Std Dev=**
F2: **(Xi-Xbar)**
G2: **(Xi-Xbar)^2**

3. Enter the following formulas. B54: **=average(b3:b52)**

B55: **=count(b3:b52)**

4. Enter the following formula.
   F3: **=b3-b54**

5. Copy the formula in cell F3 into cells F4 to F52.

6. Enter the following formula.
   G3:**=f3^2**

7. Copy the formula in cell G3 into cells G4 to G52.

8. Enter the following formula:
   G54: **=sum(g3:g52)**
   This is the sum of the squared deviations, or the numerator for the variance equation in step 3 above.

9. Enter the following formula to calculate the variance for the variable MURDER.
   B57: **=g54/(b55-1)**

10. The standard deviation is simply the square root of the variance which can be calculated with the following formula:
    B58: **=sqrt(b57)**

11. Create a scatterplot for ROBBERY (as Y) and POLICE (as X). Open the INSERT menu and select the CHART option. Respond as follows to the steps in ChartWizard as prompted.

    Step 1: Chart Type
    Select XY (Scatter) and the chart sub-type at the top of the left hand column. Then click on NEXT.
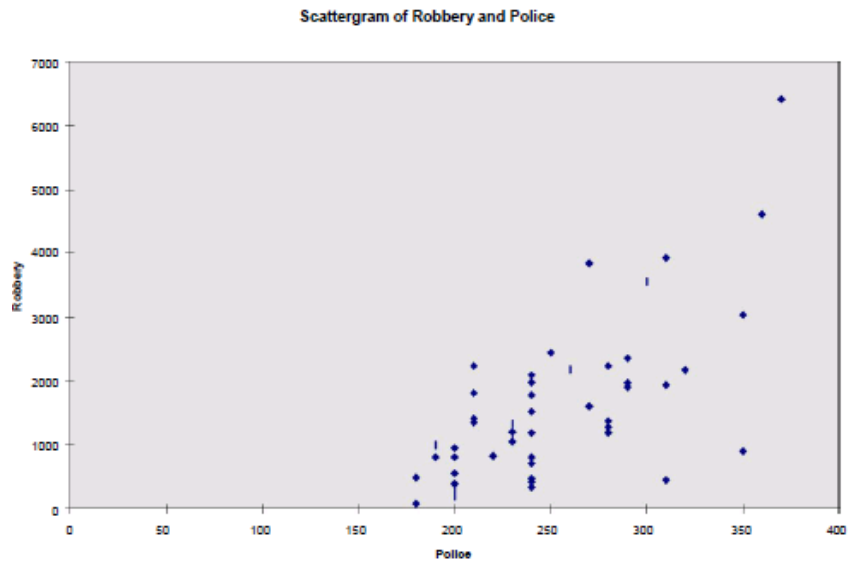
    Step 2: Chart Source Data
    If the cell range for the data and the series source are correct, then click on NEXT.

    Step 3: Chart Options
    Chart title: **Scattergram of Robbery and Police**
    Axis title–Category (X): **Police**
    Axis title–Value (Y): **Robbery**

Scattergram of Robbery and Police

Sources

1. http://web.utk.edu/~dhouston/excel/exercise.html

2. https://www.wiseowl.co.uk/excel/exercises

Course

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