

EXCEL EXERCISE #9: Using Analysis Tools

Estimating the Regression Equation:

1. Enter the information in the worksheet below.

	A	B	C	D
1				
2			U.S. POPULATION	
3	Year Var.	YEAR	Actual	
4	0	1900	77	
5	1	1910	92	
6	2	1920	106	
7	3	1930	122	
8	4	1940	128	
9	5	1950	150	
10	6	1960	178	
11	7	1970	204	
12	8	1980	224	
13	9	1990		
14	10	2000		
15	11	2010		
16	12	2020		
17	13	2030		

2. To use the regression tool in EXCEL, open the TOOLS menu, select the DATA ANALYSIS option, select the REGRESSION tool (you may have to scroll down in the list of analysis tools until regression appears), and click on OK. (If the DATA ANALYSIS option is not listed towards the bottom of the TOOLS menu, then it must be activated. To do this open the TOOLS menu, select the ADD-INS... option. Click on the empty box to the left of "Analysis Tool Pak" and click on OK.)

3. Enter the following information in the spaces indicated:

Input Y Range: **c4:c12**

Input X Range: **a4:a12**

Be sure the under the Output Options the New Worksheet Ply options is selected. Click on OK. After a few moments the following sheet labeled Sheet4 should appear containing the results of the regression analysis.

	A	B	C	D	E	F	G	H	I
1	SUMMARY OUTPUT								
2									
3	<i>Regression Statistics</i>								
4	Multiple R	0.987171							
5	R Square	0.974507							
6	Adjusted R Square	0.970865							
7	Standard Error	8.6498							
8	Observations	9							
9									
10	ANOVA								
11		<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>			
12	Regression	1	20020.27	20020.27	267.5825	7.78E-07			
13	Residual	7	523.7333	74.81905					
14	Total	8	20544						
15									
16		<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.00%</i>	<i>Upper 95.00%</i>
17	Intercept	69.26667	5.316481	13.02867	3.65E-06	56.6952	81.83814	56.6952	81.83814
18	X Variable 1	18.26667	1.116684	16.35795	7.78E-07	15.62613	20.9072	15.62613	20.9072
19									
20									
21									

Projecting Future Values:

4. Copy the regression coefficients onto the sheet with the actual population data. To do this, highlight the cell range A17:B18 and click on the COPY button. Now, select Sheet 1 (by clicking on its tab at the bottom of the worksheet) and paste the information into cell F4. To copy the R2 value onto the data sheet, click on the tab labeled Sheet4 (where the regression results are) and copy the cell range A5:B5. Click on the Sheet 1 tab and paste the information into cell F6.

5. Enter the following labels in the cells as indicated:

F3: **Regression results:**

D3: **Projected**

6. Enter the following equation into cell D4: $=\$g\$4+\$g\$5*a4$

7. Copy this formula into the cell range D5:D17. Format these numbers by selecting the 0.00 number format. These are your projected values based on the regression analysis. Your worksheet should look similar to the one below.

	A	B	C	D	E	F	G
1							
2			U.S. POPULATION				
3	Year Var.	YEAR	Actual	Projected		Regression results:	
4	0	1900	77	69.27		Intercept	69.26667
5	1	1910	92	87.53		X Variable	18.26667
6	2	1920	106	105.80		R Square	0.974507
7	3	1930	122	124.07			
8	4	1940	128	142.33			
9	5	1950	150	160.60			
10	6	1960	178	178.87			
11	7	1970	204	197.13			
12	8	1980	224	215.40			
13	9	1990		233.67			
14	10	2000		251.93			
15	11	2010		270.20			
16	12	2020		288.47			
17	13	2030		306.73			

Graphing Actual and Projected Values:

8. Highlight the range B3:D17. Open the INSERT menu, select CHART. The following steps will guide you through using the Chart Wizard.

Step 1: Chart Type

Select Line. Select “Line with markers displayed at each date value” (the left most selection in the second row of chart sub-types). Once you have selected the type of line chart, click on NEXT.

Step 2: Chart Source Data

If the cell range for the data and the series source are correct, then click on the “Series” tab. Next, click on the blank area to the right of “Category (X) axis labels.” Type in the following worksheet reference:

=sheet1!b4:b17

This command indicates that the labels for the X axis (i.e., the years of the data) are found on Sheet 1 in the cell range B4:B17. Click on NEXT.

Step 3: Chart Options

With the tab “Titles” highlighted, type in the following information next to each of the title options.

Chart title: **Projection of U.S. Population**

Category X Axis: **Year**

Category Y Axis: **Millions**

Click on NEXT.

Step 4: Chart Location

Click on the empty circle to the left of the “As new sheet” option. The text bar to the right of this option with the word “Chart1” should now be highlighted. Give the sheet that the chart will appear on a more descriptive label. Type “Forecast Chart” and click on FINISH.

Your chart should look like the one on an attached page.

9. To clean tidy your worksheet up, rename CHART1 as Projection, rename CHART2 as Residuals, rename SHEET4 as Regression, and rename SHEET1 as Data. Now save your file with the name **A:USPOP.XLS**

