Excel Group Project 1

Data and Sample Calculations
The file Excel Project 1 Data.xlsx includes three tabs.
- The first tab contains the GDP data for various countries on time periods ending around 2012.
- The second tab contains sample calculations for the Group Component.
- The third tab contains sample calculations for the Individual Component.

Rubric
This assignment includes a Group Component (50%) and an Individual Component (50%). The requirements summarized here are described in detail in the pages that follow.

<table>
<thead>
<tr>
<th>Group Component</th>
<th>Individual Component (submit 1 report per group member)</th>
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</thead>
<tbody>
<tr>
<td>Typed report with correct grammar and spelling, and all required content (see Step 5). Submit one group report for each group.</td>
<td>Typed report with correct grammar and spelling, and all required content (see Step 9). Submit one individual report per student.</td>
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Step 1: Watch a video tutorial on spreadsheet
Watch a video tutorial on spreadsheets by our textbook author, Stefan Waner.
- Goto http://www.zweigmedia.com/tcpage.html#ed6#en#calc
- Locate Section 1.2 Videos (on the right), and mouse over Videos to activate the three available links. Click on the third one “Using a spreadsheet” to go to the video tutorial (~19 minutes).
- Tip: Excel's Help is easy to navigate and contains clear explanations.
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Group component
Work as a group to complete the following analysis and report.

Step 2: Prepare your data
Create a new spreadsheet that has only the data for your country, by copying the column of dates and the column containing your country or region's data from the "World GDP Data.xlsx" spreadsheet, and pasting them into a new spreadsheet.

- Put the years in Column A and your country's GDP data in Column C.
- In Column B, put the time in years since the first date for which you have data. For example, if your first data is in 1993, then you will put 0 in Column B next to 1993, and 1 in Column B next to 1994 and so on.

Step 3: Construct models
You will do this three times, for three different types of regression line. Consider giving each group member a chance to drive the mouse.

- Create a scatter plot showing the GDP on the vertical axis and the time in years since the start of your data (from Column B) on the horizontal axes. Format the chart by doing the following.
  - Title your chart.
  - Format the scale on the vertical axis to include dollar signs and 1000's place commas. (Tip: Look for "Number" in the vertical axis' dialog box.)
  - Label the horizontal axis appropriately, including units, and display the units on the GDP somewhere on the chart.
  - Change the colors as you see fit. (Tip: Double clicking on various parts of the chart reveals formatting dialog boxes.)
- Use Excel's trendline feature to fit a linear regression model to your data. Show the equation and R^2 value on the chart.
- In a new column use the formula for the regression model to calculate the predicted values for each year in your data.
- Find the SSE for your linear regression model.
- Repeat these steps two times, once to create a quadratic model and once to create an exponential model. In each case, create a scatter plot showing the regression model and the data, a column with predicted values, and the SSE.

Step 4: Choose a model and make predictions
Since the frequent fluctuations in the data average out over time, using the full range of data may make a better long-term prediction than the current trend. Use the SSE’s to select the most accurate model of the three you studied in Step 3. Use this model to predict your country's per capita GDP for 2020.
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Step 5: Compile a group project report (1 per group)
Work together to create a 1-2 page well organized and well written report showing your group's work. Include the following.
- An introduction saying what data you are studying. Include a brief statement about the location, geographic size and population of your country.
- A table showing the data and predicted values for each model (linear, quadratic and exponential). You can copy and paste a table directly from your spreadsheet into a Microsoft Word File.
- Three charts, showing the data together with each model, its formula and $R^2$ value, displayed on the chart. Charts should include the following (see Step 3).
  - A title
  - Dollar signs and 1000's place commas on the vertical axes labels.
  - A label, including units, on the horizontal axis.
  - The units on the GDP somewhere on the chart.
In Excel, you can click on a chart to select it, and then copy and paste it directly into a word file. Within the word file, you can change the formatting (colors, fonts labels, line thickness and so on) of your charts to your liking.
- A paragraph describing how your group selected the most accurate model. Include the values of the SSE for each model in your description.
- A sentence or two stating your prediction of the GDP for your country in 2020.

Step 6: Look for the current trend
As a group, identify the year that appears to be the start of the current trend in your country's GDP. (Tip: Click on the chart, and then mouse over a data point to see its coordinates.) Each group member will use the years from the start of your current trend to the end of your data in his or her individual component of the project.

Step 7: Assign each group member a model for the individual part of the project
For the individual part, one group member will use a linear model, one will use a quadratic model and one will use an exponential model. Decide as a group who will do what.
Individual Component
Each group member completes a report showing his or her work on the analysis of the current trend in the country's GDP, using the type of regression assigned to him or her in Step 7. Your grade does not depend on the Individual Components of your group members.

Step 8: Analyze the current trend
- Create a spreadsheet showing only the current trend, again with the year in Column A, the GDP data in Column C and the time since the first year in your trend in Column B. (See Step 2.)
- Create a chart showing only the current trend, along with your model, labeling axes and providing a title as in Step 3. Include the formula for your model and the $R^2$ value on the chart.
- In a new column use the formula for the regression model to calculate the predicted values for each year in your data. Use the model to predict the GDP in 2013 and 2014.
- Calculate the percent change in GDP predicted by your model in 2013 and 2014.

Step 9: Compile an individual report (1 report per group member)
Each group member creates a report that includes the following.
- A paragraph describing the data. Say how the data is fluctuating (over what intervals is the GDP increasing, decreasing or constant?). Include a description of the feature that led your group to choose the year that you consider to be the beginning of your current trend.
- A sentence saying which model you are using to make your predictions (selected in Step 7).
- A chart showing only the current trend in the data, along with your regression model, its formula and $R^2$ value. The chart should meet the specifications described in Step 5.
- A table showing the current trend in the data and the predicted values from your model.
- A sentence or two saying the predicted values and percent change in your country's GDP in 2013 and 2014, and how you obtained them.

Step 10: Acknowledgement of participation
At the end of your individual report, write a sentence or two saying what contribution you made to the group's part of the project.