Introduction
The Gross Domestic Product (GDP) is a rough indicator of the economic health of a country. The data in this assignment is provided by the World Bank, who calculates the GDP by combining the market value of all final goods and services produced by the country over the time period. The per capita GDP is the GDP divided by the country's population.

Economists consider the percent change in the GDP to describe how the economy is changing. For example, the World Bank reports that the world per capita GDP in 2011 was $10,201.53, and in 2012 was $10,395.61. This is an increase of $194.07, which is 1.9%, since $194.07 is 1.9% of $10,201.53. Thus the percent change in GDP in 2012 is given by

\[
\text{Percent Change in GDP} = \frac{\text{Change in GDP}}{\text{GDP in 2011}} = \frac{\text{[GDP in 2012]} - \text{[GDP in 2011]}}{\text{GDP in 2011}}
\]

1. What is the Excel formula you would put in Cell C2 to use the spreadsheet to make the calculation?

2. Calculate the percent change in the world per capita GDP in 2000 and 2001. Show your work here:

3. In which year did the per capita GDP indicate greater growth in the world's economy? _____

Predicting the future
The graph shows the per capita GDP for the world from 1980 until 2012 using 2005-dollars. In this example, we construct two linear regression, one taking into account data from 1980 to 2012, and the other only considering the current trend, beginning in 2009.

4. According to the model using data from 1980 to 2012, at what rate is the per capita GDP changing? Include units.

5. Visually, which model seems likely to predict a more accurate per capita GDP for 2014? What GDP does that model predict?
In this assignment you predict the GDP in 2014 for your chosen country using the current trend in the GDP data. For the world's data, we isolate the period beginning 2009. For convenience, we use the time since 2009 in years as our variable, so \( x = 0 \) represents 2009.

6. What Excel formula would you use in cell D3 and E3?

7. Calculate the predicted value and residual for 2010.

8. What percent change does this model predict in the world per capita GDP between 2013 and 2014? Show your work with annotations that explain your answer.

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**Notes:**
- Inflation causes a dollar to have a different purchasing power from one year to the next. To compare the GDP from year to year, the World Bank calculates the GDP and then converts the result to represent its value in 2005-dollars.
- Since the GDP does not take into account the cost of living in a country, using the GDP to compare economic health of different countries may lead to an inaccurate picture.
- The GDP differs from the Gross National Product (GNP). The GDP includes only goods and services produced within the geographic boundaries of the country, regardless of the producers nationality. the GNP doesn't include goods and services produced by foreign producers, but does include goods and services produced by US firms operating in foreign countries.