

Homework 1

Homework 1 is due on **January 19 (Wednesday) at 11:59pm** through the [Gradescope](#) tab on Canvas. All submissions must be in PDF format. To save a Word document as a PDF, click “File > Save as Adobe PDF.”

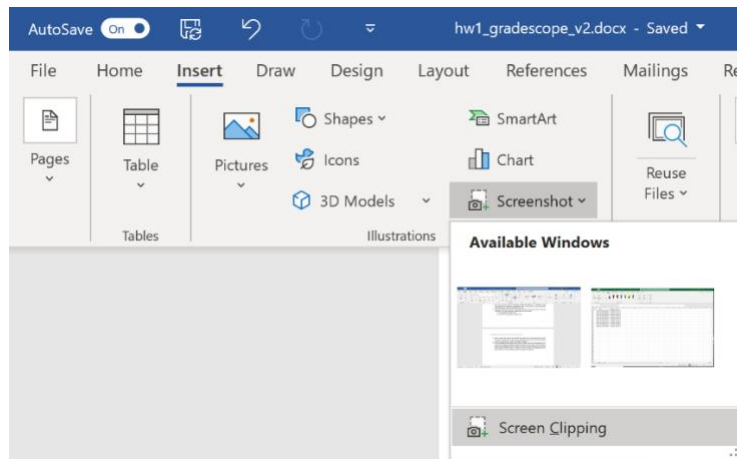
If this is your first time using Gradescope, please watch [this video](#) and budget enough time to familiarize yourself with the user interface. You will need to (1) submit the writeup as a PDF document, and (2) tag individual problems according to the instructions. Please stop by the TA’s office hours if you have questions about how to use Gradescope.

Download the cleaned data set [hw1.xlsx](#) (also available on Canvas). The file has data from 2015 on the total population, urban population, GDP, and carbon dioxide (CO2) emissions for 193 countries as reported by the World Bank.

Please follow the instructions closely and format your answers as requested.

To insert a screenshot into your Word document:

1. Open your Excel file, then go back to your Word document.
2. In your Word document, click “Insert,” then click on the “Screenshot” drop-down menu and click on “Screen Clipping.”
3. Select only the part of the Excel file you are being asked to insert, and it will show up on your Word document.



Please write down the names of the people you have worked with (if any) in the box below:

Question 1 (15 points)

Create the following variables:

- a. GDP per capita (divide GDP by the total population) [5 points].
- b. CO2 emissions per capita (divide CO2 emissions by the total population) [5 pts].
- c. Percent urban (divide the urban population by the total population) [5 pts].

Insert a screenshot of rows 1-10 of the newly created variables in the box below:

Question 2 (10 points)

Find the median and the standard deviation GDP per capita.

Copy-paste the numerical answers and functions in the table below:

Median GDP per capita (number):	
Median GDP per capita (function):	
Standard deviation of GDP per capita (number):	
Standard deviation of GDP per capita (function):	

Question 3 (5 points)

Create one more variable called “Urban/Rural” that equals “Urban” if percent urban > 50% and “Rural” if percent urban < 50%.

Insert a screenshot of rows 1-10 of the newly created variable in the box below:



Question 4 (5 points)

Count the numbers of urban and rural countries using the COUNTIF function.

Copy-paste the numerical answers and functions in the table below:

Number of urban countries (number):	
Number of urban countries (function):	
Number of rural countries (number):	
Number of rural countries (function):	

Question 5 (5 points)

Calculate the averages of the GDP per capita and CO2 emissions for urban and rural countries using the AVERAGEIF function.

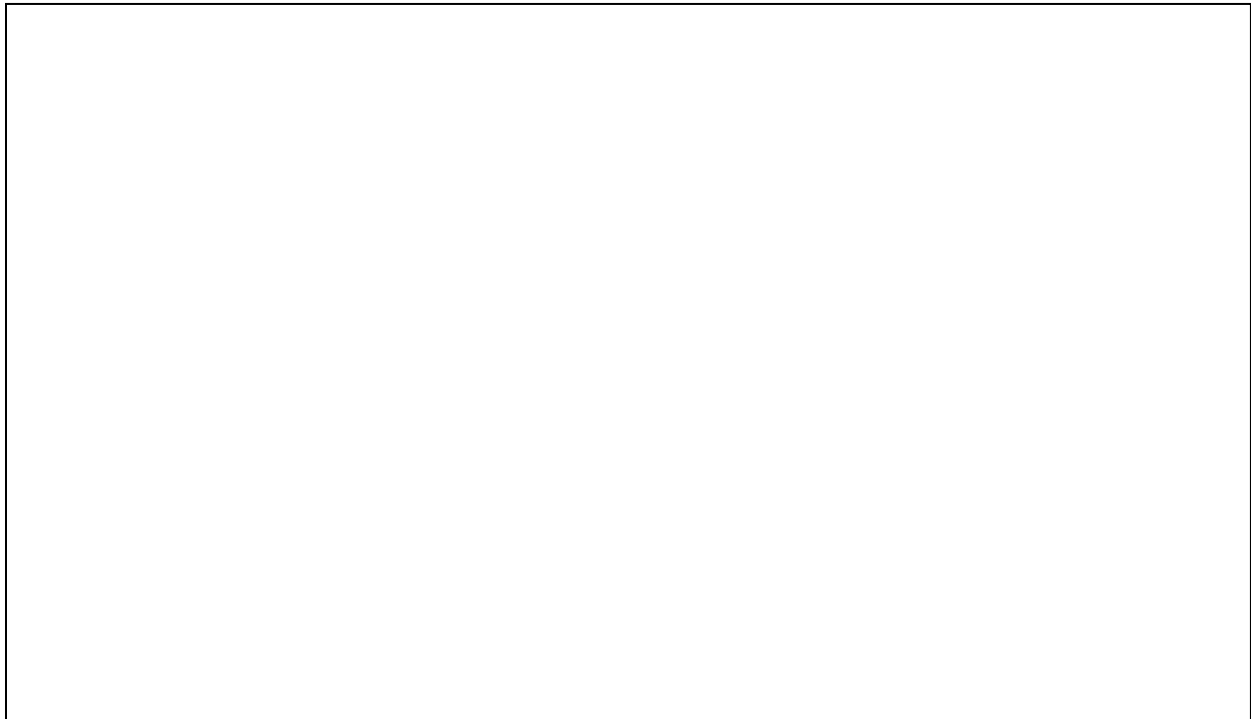
Copy-paste the numerical answers and functions in the table below:

Average GDP pc, Urban countries (number):	
Average GDP pc, Urban countries (function):	
Average GDP pc, Rural countries (number):	
Average GDP pc, Rural countries (function):	
Average CO2 pc, Urban countries (number):	
Average CO2 pc, Urban countries (function):	
Average CO2 pc, Rural countries (number):	
Average CO2 pc, Rural countries (function):	

Question 6 (5 points)

Create a bar graph comparing the average GDP per capita of urban and rural countries.

Insert a screenshot of your bar graph in the box below:



Question 7 (5 points)

Now you are curious what CO2 emissions are like in Greenland. Use VLOOKUP to find the amount of CO2 emissions in Greenland.

Copy-paste the numerical answer and function in the table below:

CO2 emissions in Greenland (number):	
CO2 emissions in Greenland (function):	

Question 8 (10 points)

Using the LOG function, create the following variables:

- a. Log of GDP per capita [5 pts].
- b. Log of CO2 emissions per capita [5 pts].

Insert a screenshot of rows 1-10 of the newly created variables in the box below:

Question 9 (10 points)

Create a scatter plot with the log of GDP per capita on the x axis and the log of CO2 emissions per capita on the y axis. Be sure to label all axes, add a title, and add a trendline.

Insert a screenshot of the scatter plot in the box below:



Question 10 (30 points)

Write a paragraph (max. 150 words) summarizing what the data are telling us about the relationship between economic development, urbanization, and CO2 emissions. On average, are urban countries more or less developed than rural countries? Do urban countries pollute more or less than rural countries? Finally, is there a correlation between economic development and CO2 emissions? If yes, is the correlation positive or negative?

