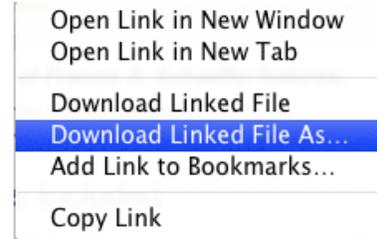
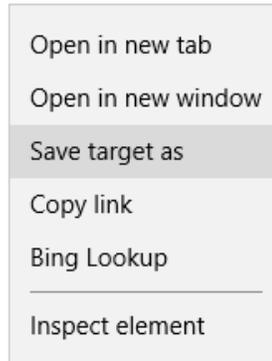
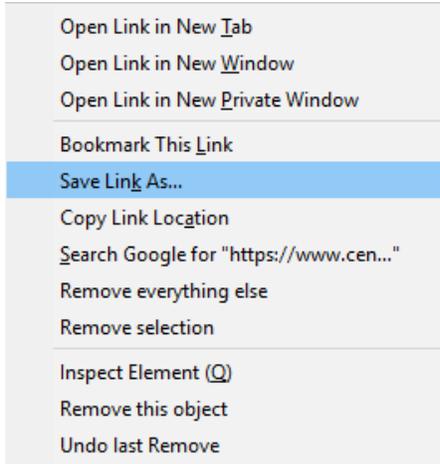


Tips for Problem Set 1

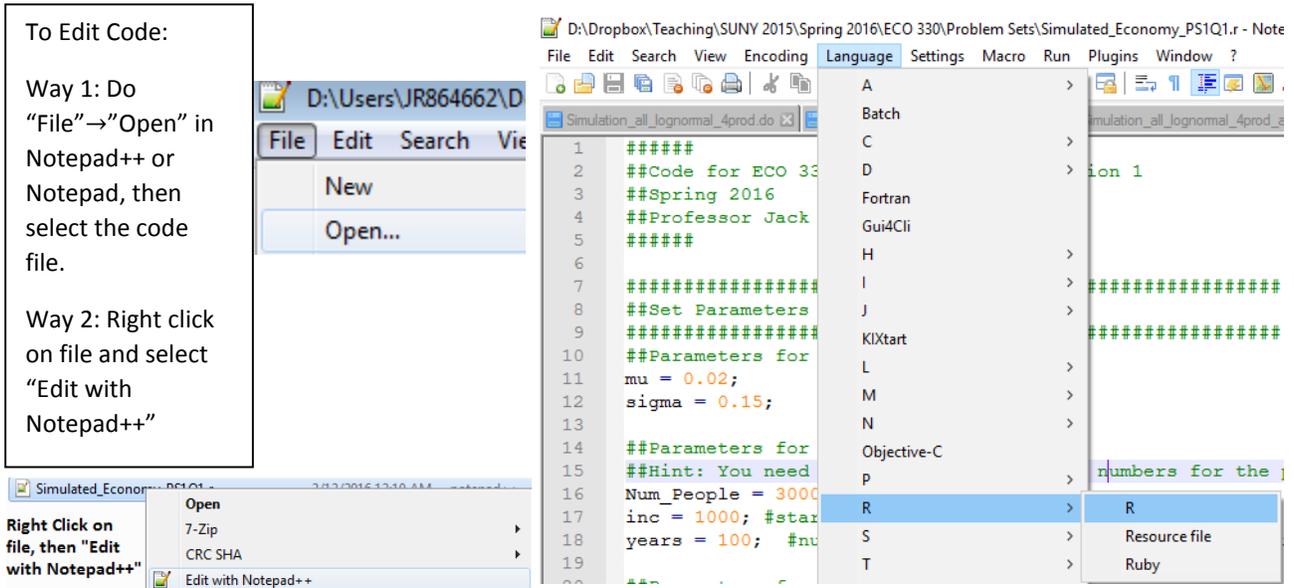
Problem 1

Tip 1.1: To download the code to your desktop, right click on the link and select “Save As”. Depending on your browser the exact wording may differ slightly. Examples below



Tip 1.2: Don't edit code in a word processor such as Microsoft Word. Use a plain text editor such as Notepad. Even better, use a plain text editor with syntax highlighting such as [Notepad++](#). Notepad++ should recognize the code automatically due to the .r file extension. If it's not enabled you can enable it under “Language”

To Edit Code:
 Way 1: Do “File”→”Open” in Notepad++ or Notepad, then select the code file.
 Way 2: Right click on file and select “Edit with Notepad++”



Tip 1.3: You can download R from <https://cran.r-project.org/> for free. It should already be installed on all the computers in the computer labs. There are manuals to help you learn R available on the CRAN website <https://cran.r-project.org/manuals.html> and elsewhere on the internet. The “help” function in R is also useful if you don’t understand what a function does. For example, typing `help(max)` will tell you what the `max()` function does.

Tip 1.4: The most complicated parts of the problem have already been done for you in the code I uploaded on my website (except for the challenge question). You just need to go through it and figure out what numbers to change and what parts of the code to re-use. Trial and error works great for figuring out what each part of the code does.

Tip 1.5: Your graphs do not need to look professional for this problem. The default R formatting is fine.

Problem 2

Tip 2.1: If you are stuck, look at the example of the completed growth accounting for Mexico.

Tip 2.2: Look at the growth accounting notes on the website for additional information on the growth accounting procedure. It has more detailed variable definitions. For example, GDP per Working Age Person is Y/N and labelled “output” on the example growth accounting chart for Mexico.

Tip 2.3: See the end of “[Notes on Time to Convergence](#)” on the website for quick overview of Goal Seek

Tip 2.4: See end of this document for tips on making your graphs look professional.

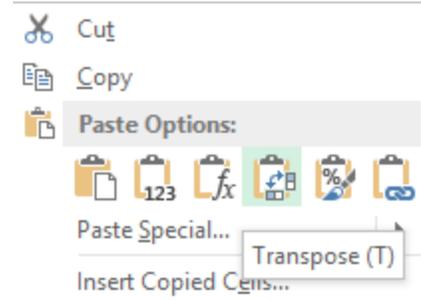
Problem 3

Tip 3.1: You can press the checkmark, , to select all within the category (I suggest using it when you select the time range) and the X, , to deselect all within the category. The site may load with some options selected, and it’s useful to deselect them.

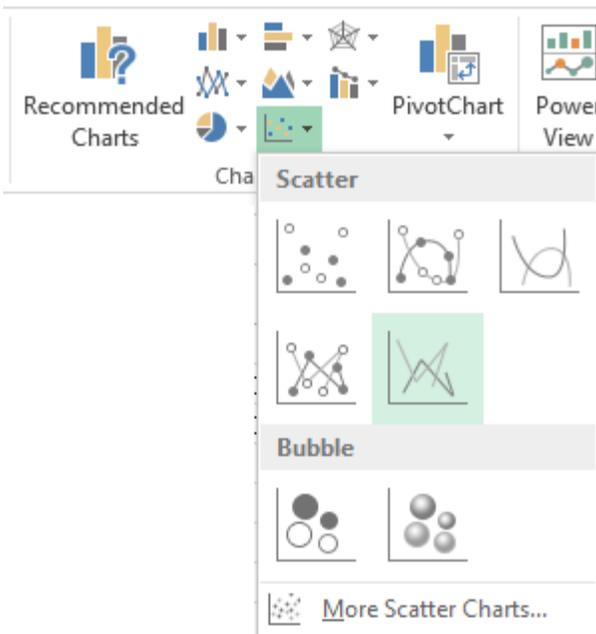
Tip 3.2: Use the search feature to quickly find the countries and series that you want. More keywords equals more results, so I suggest searching for just “GDP” and scrolling through the search results to find “GDP per Capita (constant 2005 US\$)” rather than searching using the full name of the series.

Tip 3.3: Here are the values of each series in 1975 so you can verify you have the correct ones. China = 171.9588, Mexico = 5473.638

Tip 3.4: You can transpose data in Excel. First, select and copy (by pressing Ctrl+C or right clicking and selecting copy) what you want to transpose. Next, right click where you want to paste the transposed data (can't overlap with copied area) and select transpose under paste options. You can do "Paste Special" to combine multiple options (such as "transpose" and "paste as values")

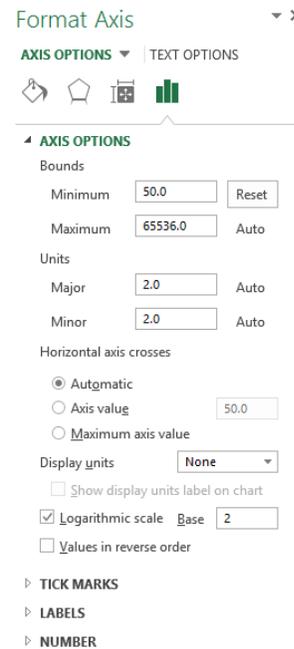


Tip 3.5: Add a graph in excel by highlighting the data you want and then clicking the "Insert" tab then "Scatter with Straight Lines" under charts. If Excel doesn't automatically select the correct series for your graph you can right click on the graph and click "Select Data". It's often useful to move the graph to its own tab by right clicking on the graph and selecting "Move Chart" then "New Sheet".

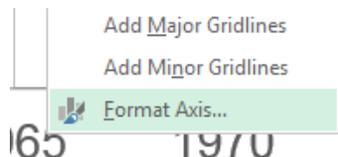


For Tip 3.6 →

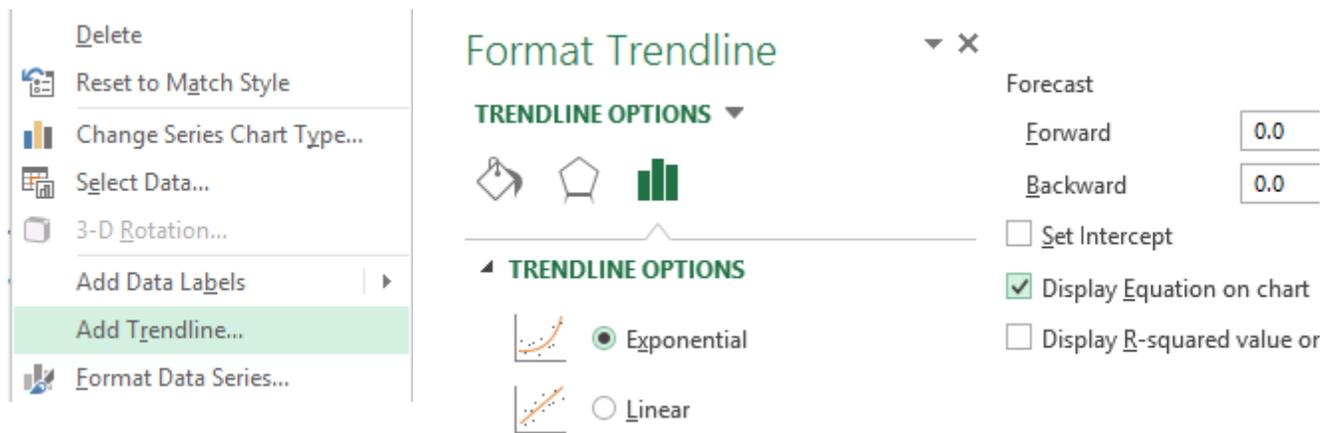
← For Tip 3.5



Tip 3.6: To format the axis, right click on it and select "Format Axis". There will be options that allow you to set the range for the graph and choose whether the axis has a linear or logarithmic scale.



Tip 3.7: To add a trendline in Excel, right click on the data series on the chart and select “Add Trendline”. Under Format Trendline you can change it to an exponential trendline. There is a checkbox further down to display the equation on the chart.



Tip 3.8: If you don't know how to do something in Excel, or it isn't working, google for help or ask a classmate. We will spend a day each in the computer lab to practice Excel and R, but otherwise I will not be providing additional support. You do not have to use Excel if you prefer alternative software.

Professional Graphs

Below are some basic essentials for making your graphs look professional. You will lose points if your graphs for problems 2 and 3 do not meet this criteria (problem 1 is excluded from this criteria).

- **Easy to distinguish lines.** Excel automatically selects colors, usually it does a good job, but if it doesn't you should change the color/formatting of each line yourself.
- **Large fonts.** The default fonts on the Axis and Chart Title are too small. Make the font large enough to read easily, at least size 14 for most standard fonts.
- **No excess space.** The axis of the graph should not extend far beyond your data series. Ensure that you do not start your graph in 1950 if you don't have data until 1960 (start it in 1960). For the vertical axis, start it only a little below your lowest value and a little above the highest value unless you have a very good reason for including additional space.
- **Label the graph.** Everybody should be able to look at the graph and know exactly what everything is. Label the chart, each axis, and all data series unless you have a good reason not to do so.