**INTRO TO EXCEL SPREADSHEET (World Population)**

**Objectives:**

Become familiar with the Excel spreadsheet environment. (Parts 1-5)

Learn to create and save a worksheet. (Part 1)

Perform simple calculations, copy formulas, fill, and edit (part 2)

Relative vs fixed references (part 2)

Graphing Equations and Formatting text and graphs (part 2 and 3a,3b, and 3c)

Learn to import data into Excel spreadsheet. (part 4) [parts 4&5 are in separate document]

Learn to make a graph of spreadsheet data and to compare data with model. (part 5)

Learn about world population (past, present, and future projections)

**Part 1: Opening Excel and creating your first worksheet**

In this section, the text that you actually type in will appear as bold faced and pressing the enter key is indicated by **[E]**, which can usually be done with a click on the OK button in a dialog box or using the arrows up, down, right, or left.

Open the Excel program by double clicking on the Microsoft Excel icon or selecting it from programs on the start menu. Ask for help if you can’t find it., or use the find file command (on start menu for PC)

An empty worksheet should appear on your screen. If you are using a different version of Excel, the menu bar may not look exactly like the one shown below; this should not be a problem for this introductory tutorial.



First enter some labels in cells A2-A4.

Select cell A2 by pointing on the cell A2 and clicking once.

Type in **Name:**

The pointer is now in cell A3.

Type in **Date:** and then Type in **Assignment:** for cell A4

We use the *shorthand notation* below for the somewhat verbose instructions above to make this instruction guide easier to follow.

A2: **Name:**

A3: **Date:**

A4: **Assignment:**

You may want **to change the column width** if your entries are too long for the default widths. You can do this by clicking on the A at the top of column A to select the whole column and then either:

|  |  |  |
| --- | --- | --- |
| |  | | --- | | 1) moving the cursor to the line between A and B and clicking and dragging the width to a new size.  *Easiest way for one or several columns side by side.* | |  |
| |  | | --- | | Or go to the ***Format*** menu (in the ***cell*** area of the ***Home*** tab) click with the mouse and then drag down to the ***column***-***width,*** and change the width value to a new width. ***Home-Cell***-***Format - Column – Width box*** is our short hand in this activity. | | |
|  | |

In cells B2 - B4 enter your name, date, and ―World Population‖ for the assignment.

|  |  |  |
| --- | --- | --- |
| |  | | --- | | For practice, *save your new worksheet* to your STUDENT # using the ***Save As*** command under the Office button.  The **office button** is circled in red and the file save button is circled in blue.  Clicking the file save button will automatically use the save-as command if you have not yet saved the file and will resave the file once it has a name. | |  |

A dialog box will appear that has *book1* highlighted.

|  |  |  |  |
| --- | --- | --- | --- |
| |  | | --- | | Type in the name for your file as  **IntroExcelActivity.xlsx**  Click on the **Drop Down menu** and navigate to the location that you want to save your work. Don’t forget where it is.  Click on the save button (or press return). | |  | |  |

**Part 2. Doing repetitive calculations with Excel.**

In this assignment we are going to create a table of values for world population from 1950 to 2050 assuming that it obeys the following equation.

Hereis the population at any time **,** is the initial population at =0 [1950 in our case], is the growth rate.

We assume that we know and from measurement, and will use this analytical model to calculate the population for different values of time after 1950 **(****=*year*-1950)**. Later we’ll use this table to make a graph of the World Population (predicted from the equation above) from 1950 to 2050.

In cells A6 – A7 enter:

A6: **initial population**

A7: **initial growth rate**

In cells B6 – B7 enter:

B6: **Ao=**

B7: **r =**

In cells C6 – C7 enter:

C6: =**2.52**

C7: =**10**

*(the equal signs for C6 & C7 are important).*

|  |  |  |
| --- | --- | --- |
| |  | | --- | | Let's format the labels in cells B6-B7 to spiff up their appearance. ***Select cells*** B6 – B7 by: pointing on B6, pressing and holding the mouse button, dragging the pointer to cell B7.\*\* (B6 – B7 should now be highlighted.)  — From the Home Tab click on the right justification icon under alignment.  \*\* Select Cells B6-B7 | |  |

The nice thing about the Excel environment is that when you set the mouse pointer on top of a toolbar icon a text box appears describing what that icon does.

Click on the box labeled **[B]** in the tool bar under the Home Tab (font) to make your labels in B6-B7 bold. *[they are still selected?]*

Make the labels in cell A2 - A4 Bold by following the same procedure as above (select and click on [B] icon. Select cells C6 - C8 and left justify these cells using the left justify icon 

OOPS! We made a mistake. We forgot to put **units** on the labels in cells B6 – B7. Units are always very important. Although Excel can only do calculations with numerical values, indicating what units these values are in is important so that the numbers are useful. No problem, we'll do it now.

|  |  |  |
| --- | --- | --- |
| |  | | --- | | Select cell B6.  Position the cursor between the o and = sign of the ***formula bar*** at the very top of the screen and click. Now type **(Billions)**. This should give you **Ao(Billions)=** in cell B6 | |  |

In the same way include units for B7 (%/yr).

|  |  |  |
| --- | --- | --- |
| |  | | --- | | Use the ***Home tab Number*** command to increase or decrease the number of decimal places used. Select 2 for C6 and C7 so your number appear as  2.52 and 10.00 respectively | |  |

In cells B10 & C10, enter:

B10: **Year**

C10: **Population (Billions)**

Make these labels bold and align them in the center with center alignment.

Here’s a sample problem that we’ll solve using the Excel environment.

*Given that the initial 1950 population is 2.52 billion people and the growth rate in 10% per year, what is the estimated population in 2000?*

Here we show the Excel equation and then right below we show the corresponding terms of the analytic formula.

Enter the following formula in cell c11:

**=C6\*2.72 ^((C7/100)\*(B11-1950))** *(again make sure to include the = sign and hit the enter key)* Also you do not need to include the spaces.

Enter 1950 for B11. If everything works correctly when you change B11 from 1950 to 2000 the value of C11 goes from 2.52 (billion) to 375.18 billion.

When you change B11 from 2000 to 1980 the value of c11 becomes \_\_\_\_\_\_\_\_\_\_\_\_\_?

**The above is great** because we have created a calculator that allows us to put any value of time into cell C10 and have Excel calculate the population for that year and display it in cell C11. We can also change the values of **Ao and r** by entering new values in c6 and c7. This is a very handy tool for evaluating an equation. The advantage of this over a calculator is once the formula is typed in correctly it can easily be used over and over again. Another advantage is that if you type in the formula incorrectly, you don’t have to start all over to fix it but can simply edit it in the formula bar.