

Excel: Tutorial Week 1

- Common math operators and the order of operation
- Formatting long sequences of data: merging and wrapping
- Defining new formulas
- Within worksheet and cross worksheet references
- Named constants
- Data validation

Official resource for MS-Office products: <https://support.office.com>

Activities In Tutorial

- TA demos:
 - Used for more complex features (typically multiple steps are required).
 - The tutorial instructor will show on the projector/instructor computer each step for running the feature in Excel.
 - Unless otherwise specified the tutorial material will take the form of a TA demonstrating the use of features in Excel.
- Student exercises:
 - Used instead of TA demos for simpler features.
 - You will have already been given a summary of how to invoke the feature and the purpose of the exercise is to give you a chance to try it out and get help if needed.

First Tutorial

Requirements For First Excel Workbook Exercise

- Error prevention (before) and error handling (after):
 - 10 digit Canadian telephone number.
 - Selecting a university faculty from a list or entering a correct faculty.

Requirements For The Spreadsheet Full Assignment: Excel

- Calculating and visualizing grading information for the CPSC 203 class of the future (AD 2063: Anyone realize the significance of that year?...A major 'first' for humanity)
- You **MUST** use the starting grades in the starting spreadsheet.
 - (It should go without saying that you **must not** modify the grade information either).
 - Why?
 - Streamline marking (consistency will allow the marker grade more quickly)
 - In industry your (paying) client or your boss wants you to implement certain features with a given data set and a given problem. (No one will pay you for just demonstrating that you know how to use a feature).
- Read the assignment requirements thoroughly and carefully: there are many other things that you **MUST** do in order be awarded credit.

MS-Excel tutorial notes by James Tam

Second Tutorial

Symbols In Excel: Common Math Operations

Operation	Symbol in common use	Symbol used in Excel	Example usage (Excel)
Assignment	=	=	=3 (puts 3 into the cell)
Addition	+	+	=2+2
Subtraction	-	-	=7-3
Multiplication	×	*	=9*9
Division	÷	/	=36/6
Exponent	NA: superscripting is used e.g. 3 ²	^	=3^2 (3 squared)

Full details:

<https://support.office.com/en-us/article/Calculation-operators-and-precedence-in-Excel-48be406d-4975-4d31-b2b8-7af9e0e2878a>

MS-Excel tutorial notes by James Tam

Order Of Operation In Excel (First To Last)

	Operator	Description
↑ First	Brackets	Inner brackets before outer e.g. =((4+2)/3)-1
	Negation	=-3*2
	Exponent	=2^4/4
↓ Last	Multiplication, Division	These operators are evaluated left to right in terms of order because their order is equal e.g. =10/3*2
	Additional, subtraction	Similar to multiplication and division these operations are equal in terms of order (so a left to right evaluation is used)

For full details of how other operators are ordered in Excel:

<https://support.office.com/en-us/article/Calculation-operators-and-precedence-in-Excel-48be406d-4975-4d31-b2b8-7af9e0e2878a>

MS-Excel tutorial notes by James Tam

Example Exercise

- What is the result of the following expression?

$$= 7 + 8 * 3 / 2 - 4 = 15$$

Lesson:
Explicitly bracket everything!

MS-Excel tutorial notes by James Tam

What To Do When The Data Is Too Long

- The data in Cell F8 is cut off

	F	G	H
8	Explanations of formulas (Col B - D: Row 9 - 10)		
9	AVERAGE(B3:B6)	AVERAGE(C3:C6)	AVERAGE(D3:D6)
10	TRUNC(B9)	etc.	etc.

- Full data: Explanations of formulas (Col B - D: Row 9 - 10)
- Data displayed: Explanations of formulas (Col B -

- Options:
 - Merging cells
 - Wrap the cell data
 - (Resizing rows and columns is covered in the introductory Excel material).

MS-Excel tutorial notes by James Tam

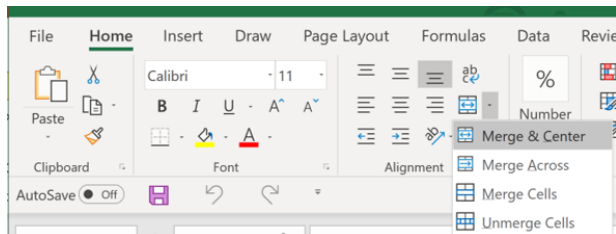
Merging Cells: Spreadsheet

- **Example spreadsheet:** You can use this spreadsheet (under the tutorial materials for this week) to see the effects of merging cells: functions

MS-Excel tutorial notes by James Tam

Invoking Features To Merge Cells

- Home -> Alignment group



MS-Excel tutorial notes by James Tam

Merge (Only Combining Columns In 1 Row)

- Merging cells F8 to G8
- Unmerged cells

	F	G	H
8	Explanations of formulas (Col B - D: Row 9 - 10)		
9	AVERAGE(B3:B6)	AVERAGE(C3:C6)	AVERAGE(D3:D6)
10	TRUNC(B9)	etc.	etc.

- Merge and center

	F	G
8	Explanations of formulas (Col B - D: Row 9 - 10)	
9	AVERAGE(B3:B6)	AVERAGE(C3:C6)
10	TRUNC(B9)	etc.

MS-Excel tutorial notes by James Tam

Merge (Combine Columns Spanning Multiple Rows)

- Merging cells A9 to D10
- Before merging
- Merge and center (combines columns & row)
 - Combine & center align the contents of selected cells into one larger new cell
 - JT: Keeps top LHS cell only
- Merge across (combines columns)
 - “Merge selected cells in the same row into one large cell”
 - JT: Keeps left-most column only
- Merge cells (combines columns & rows)
 - “Merge the selected cells into one cell”
 - JT: Similar to M&C but result isn’t centered

	A	B	C	D
9	Averages (real)	56.25	15	3.25
10	Averages (whole)	56	15	3

	A	B	C	D
9	Averages (real)			
10				

	A	B	C	D
9	Averages (real)			
10				

	A	B	C	D
9	Averages (real)			
10				

MS-Excel tutorial notes by James Tam

Using Merge: Caution & JT's Tips

- Using the “Unmerge cells” option in Excel **will not** restore lost data.
 - JT: Use the ‘undo’ option instead <Ctrl>-<Z>
- JT: It’s recommended that the merge features only be used only a spreadsheet that is largely finalized because merged cells will interfere with some Excel operations:
 - E.g. copy pasting will ‘unmerge’ cells

MS-Excel tutorial notes by James Tam

Wrapping Cell Data

- Example, text not wrapped (some text can be cut off)

	A	B	C	D
8	Functions (average, trunc)			
9	Averages (real)	56.25	15	3.25
10	Averages (whole)	56	15	3

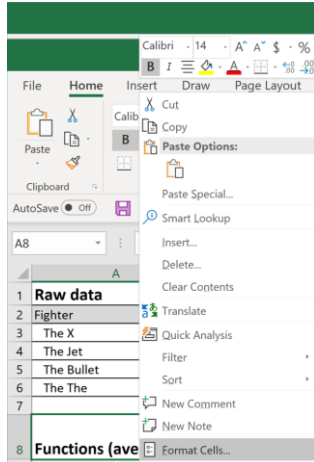
- Wrapped text (text wraps to the next row or rows)

	A	B	C	D
8	Functions (average, trunc)			
9	Averages (real)	56.25	15	3.25
10	Averages (whole)	56	15	3

MS-Excel tutorial notes by James Tam

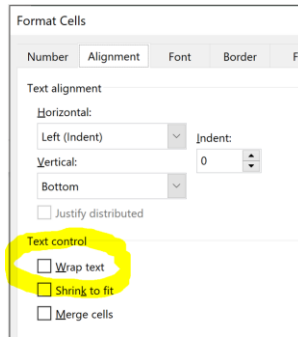
Invoking Text Wrapping

Right click on the cell or cells



MS-Excel tutorial notes by James Tam

Under the 'Alignment' tab (text control group) check "Wrap text"



Indenting

- Indenting (Rows 3 – 6)

	A	B	C	D
1	Raw data			
2	Fighter	Wins	Losses	Ties
3	The X	10	10	10
4	The Jet	50	20	1
5	The Bullet	100	17	0
6	The The	65	13	2

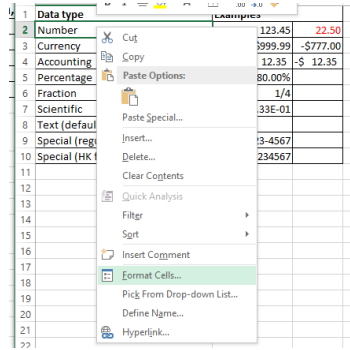
- **Step 1:** Right click on cell or range of cells and select 'Format Cells' to change indenting (and fill color)

	A	
1	Raw data	
2	Fighter	W
3	The X	10
4	The Jet	50
5	The Bullet	100
6	The The	65

MS-Excel tut

Indenting (2)

- **Step 2:** Select “Format cells”

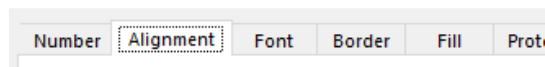


MS-Excel tutorial notes by James Tam

Indenting (3)

- **Step 3:** Select the alignment tab (the ‘Number’ tab is selected by default)

Format Cells



MS-Excel tutorial notes by James Tam

Indenting (4)

- **Step 4:** Specifying the amount of indenting desired (0 = no indenting, the larger the number the greater the amount of indenting).

Format Cells

Number Alignment Font Border Fill Protection

Text alignment

Horizontal:
Left (Indent)

Vertical:
Bottom

Indent: 1

Justify distributed

MS-Excel tutorial notes by James Tam

Defining New Formulas

- The first character must be the “assignment operator” =

– **Formula** =2 + 2

	A	B	C	D
1	Formula	4		

– **Text** 2 + 2

	A	B	C	D
1	Formula	4		
2	Text	2+2		

MS-Excel tutorial notes by James Tam

Formulas Referring To Other Cells

- **Reminder:**
 - **Approach 1:** manually type in the formula
 - Type in the formula manually e.g. type =A2*B2

	A	B	C
1	Income	Tax rate	Tax owed
2	100000	0.25	=A2*B2

- **Approach 2:** type and click (used when a formula refers to a cell)
 - Click on a cell where you want to enter the formula e.g. click on cell C2
 - Using the above example:
 - Type in the assignment operator =
 - Click on Cell A2
 - Type in the multiplication operator *
 - Click on Cell B2

MS-Excel tutorial notes by James Tam

Student Exercise: Formulas

- **Starting spreadsheet:** “formula exercise”

	A	B	C	D
1	CPSC 409 grade calculator			
2	Midterm #1 GPA	Midterm #2 GPA	Final exam GPA	Term GPA
3	4	3	2	

- For CPSC 409: the term GPA is calculated from the following proportions
 - Midterm #1: 35% of term grade
 - Midterm #2: 35% of term grade
 - Final exam: 30% of term grade
- In cell D3 calculate the weighted term GPA

MS-Excel tutorial notes by James Tam

Data Validation

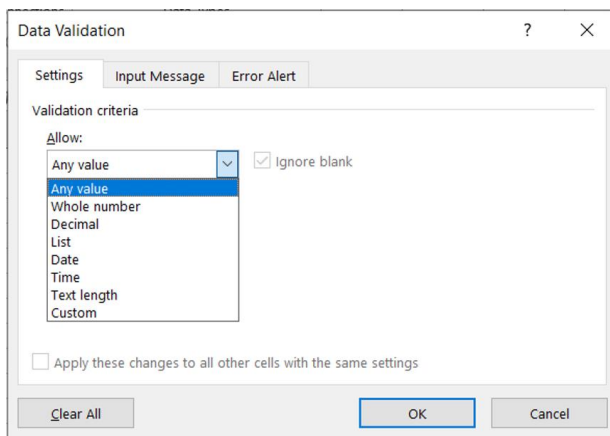
- There are tools in Excel to ensure the validity of data:
 - The type of information entered is of the correct type e.g. whole numbers only, no fractions allowed.
 - The data entered falls within a valid range e.g. no negative values can be entered for age.
- Invoking data validation:
 - Data -> Data Tools : Data Validation

For more information:

<https://support.office.com/en-us/article/Apply-data-validation-to-cells-29FECBCC-D1B9-42C1-AD76-EEF3CE5F7248>

MS-Excel tutorial notes by James Tam

Data Validation: Specifying The Type Of Data



Options that are largely self explanatory

- Whole number
- Decimal
- Date
- Time

No restrictions on data entry

- Any value

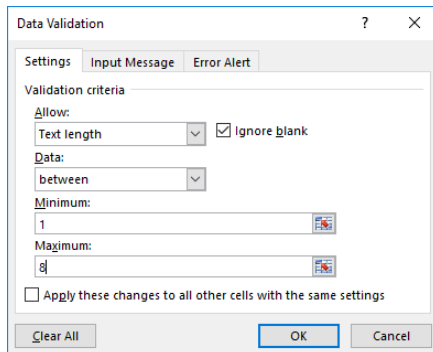
Restrictions on the number of characters

- e.g. login user name must be 3 – 50 characters in length

MS-Excel tutorial notes by James Tam

Data Validation: Input Length Restrictions

- Steps: Data -> Data Tools : Data Validation and then select the 'Settings' tab ('Settings' should be selected by default).

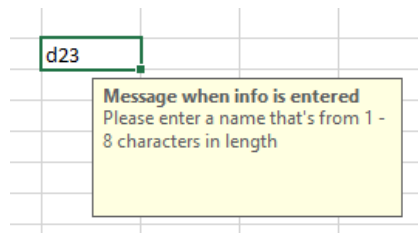
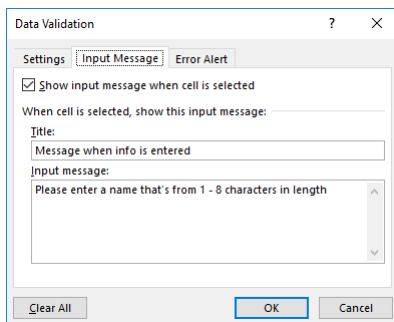


MS-Excel tutorial notes by James Tam

Data Validation: Guiding The User Beforehand

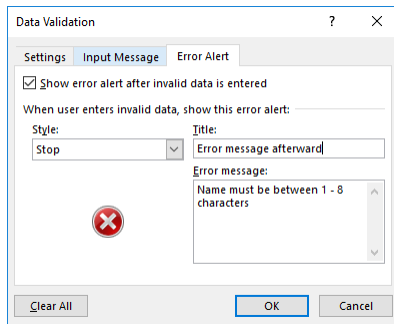
Select the Input Message tab.

Helpful message appearing when a cell mouse-over occurs

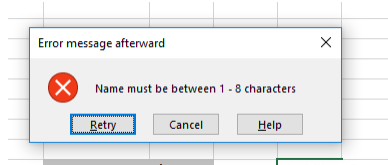


Data Validation: Letting The User Know After The Fact

Select the Error Alert tab.



Popup error message appearing when the validation rule has been violated.



Other Excel Resources

- Online training resources created by Microsoft:
 - Tutorials
 - <https://support.office.com/en-us/article/excel-for-windows-training-9bc05390-e94c-46af-a5b3-d7c22f6990bb>
 - A MAC specific resource
 - <https://support.office.com/en-us/article/excel-2016-for-mac-help-2010f16b-aec0-4da7-b381-9cc1b9b47745>