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

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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.

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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
    - 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.

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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

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Order Of Operation In Excel (First To Last)

First ... **Last**

Operator	Description
Brackets	Inner brackets before outer e.g. =((4+2)/3)-1
Negation	=-3*2
Exponent	=2^4/4
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

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Example Exercise

- What is the result of the following expression?

= 7 + 8 * 3 / 2 – 4 = 15

Lesson:
Explicitly bracket everything!

What To Do When The Data Is Too Long

- The data is Cell F8 is cut off

F8		:	✕	✓	fx	Explanations of formulas (Col B - D: Row 9 - 10)

	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
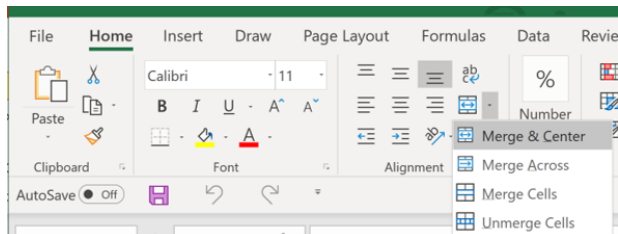 – (Resizing rows and columns is covered in the introductory Excel material).

Merging Cells: Example

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

Invoking Features To Merge Cells

- `Home -> Alignment group`

Merge (Only Combining Columns In 1 Row)

- Merging cells F8 to G8
- Unmerged cells

F8	▼	:	×	✓	fx	Explanations of formulas (Col B - D: Row 9 - 10)

	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.

Merge (Combine Columns Spanning Multiple Rows)

- Merging cells A9 to D10
- Before merging

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

- 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

	A	B	C	D
9				
10	Averages (real)			

- Merge across (combines columns)
  - "Merge selected cells in the same row into one large cell"
  - JT: Keeps left-most column only

	A	B	C	D
9	Averages (real)			
10	Averages (whole)			

- 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				
10	Averages (real)			

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

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

Invoking Text Wrapping

Right click on the cell or cells
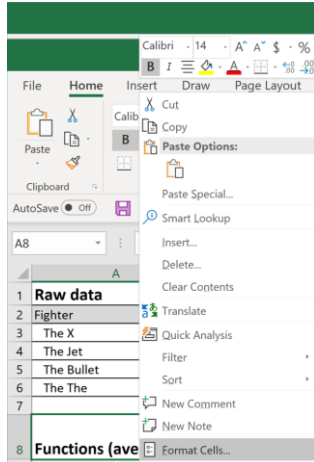
Under the 'Alignment' tab (text control group) check "Wrap text"

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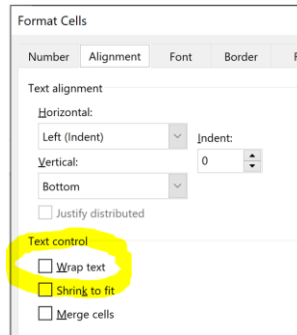
Indenting

- Indenting (Rows 3 – 6)

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

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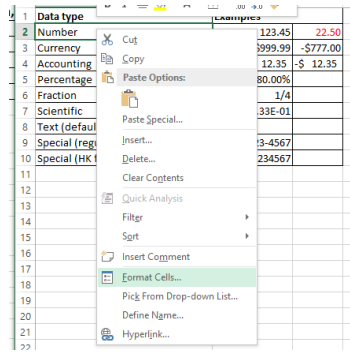# Indenting (2)

- **Step 2**: Select "Format cells"

Indenting (3)

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

Number	Alignment	Font	Border	Fill	Prot

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	Prot

Text alignment

Horizontal:

Left (Indent) Indent: 1

Vertical:

Bottom

☐ Justify distributed

Defining New Formulas

- The first character must be the "assignment operator" =
  - **Formula** =2 + 2

B1   fx =2+2

	A	B	C	D
1	Formula	4		

  - **Text** 2 + 2

B2   fx 2+2

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

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

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Student Exercise: Formulas

- Refer to the 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

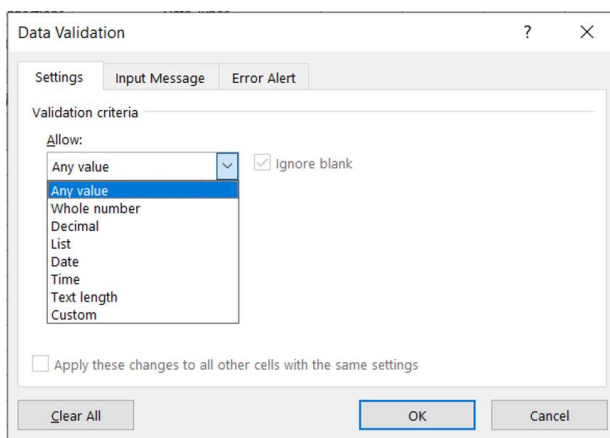MS-Excel tutorial notes by James Tam

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-D1B9-42C1-0D76-EFF3CE5F7249
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Data Validation: Specifying The Type Of Data

Options that are largely self explanatory
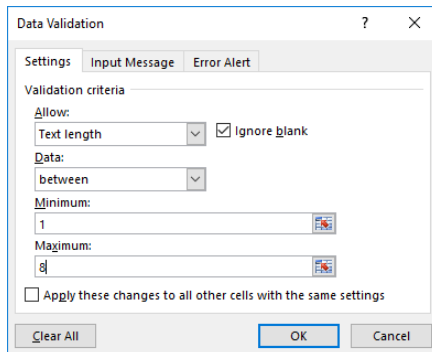- Whole number
- Decimal
- Date
- Time

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

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Data Validation: Input Length Restrictions

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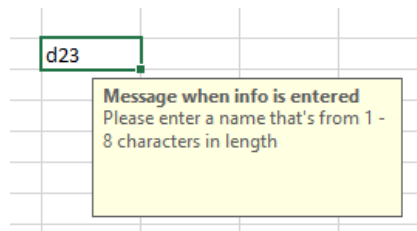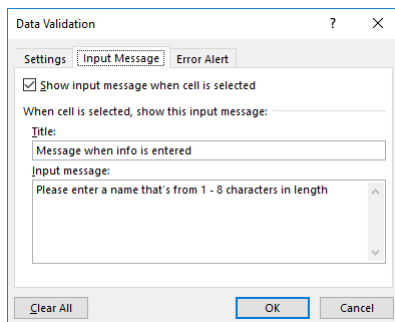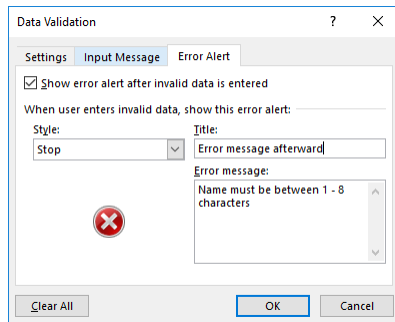
Data Validation: Guiding The User Beforehand

Select the `Input Message` tab.

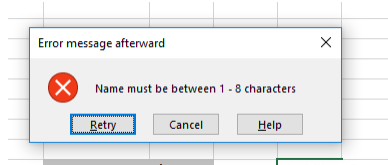Helpful message appearing when a cell mouse-over occurs

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

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