

Excel: Tutorial Week 2

- Multiple worksheets
- Named constants
- Using pre-created functions
- Setting the format of data in a cell
- Highlighting important information via conditional formatting

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

First Tutorial

Thanksgiving Monday: October 12

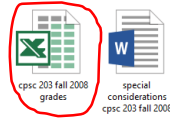
- No tutorial on Monday
- Tuesday tutorials are designated as Open Tutorials.
 - TA is available for help but no new material will be taught.

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Second Tutorial

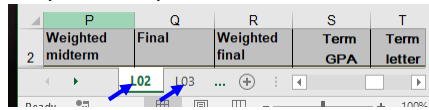
Terminology

- Spreadsheet (referred to as a “workbook” by Microsoft)
 - A Microsoft **Excel file**



- **Worksheet**

- A part of a spreadsheet



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Formula References To Other Worksheets

- Example spreadsheet: “references_v1_10%tax”

“Employees” worksheet

	A	B	C	D
1	SIN	Salary	Taxes owed	Net income
2	111111111	\$50,000.00	\$5,000.00	\$45,000.00
3	111111112	\$60,000.00	\$6,000.00	\$54,000.00

“Rates” worksheet

	A	B
1	Tax rate	10%

References to same worksheet

D2 X ✓ fx =B2-C2

	A	B	C	D
1	SIN	Salary	Taxes owed	Net income
2	111111111	\$50,000.00	\$5,000.00	\$45,000.00

Reference to **another worksheet**

C2 X ✓ fx =B2/Rates!B1

	A	B	C	D
1	SIN	Salary	Taxes owed	Net income
2	111111111	\$50,000.00	\$5,000.00	\$45,000.00

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Named Constant

- The same value is referenced many times in sheet so it is defined once as a “named constant” – a constant given a name
 - **Named constants:** Tax Rate = 10%, PI = 3.14
 - **Unnamed constant:** =B2 * 0.1

	A	B
1	Tax rate	10%

- Named constants are typically defined and grouped in a lookup table
- This is an example of how your assignment style marks could be affected i.e. retyping the 0.1 (poor approach, what if the **weighting** changes then the unnamed constant must be retyped many times)
 - = B2 * 0.1
 - = B3 * 0.1

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Advantages Of Using Unnamed Constants

- Taxes change, example spreadsheet:** references_V1_20%tax

	A	B	C	D
1	Tax rate	20%		

- One change updates everything that refers to !RatesB1

	A	B	C	D
1	SIN	Salary	Taxes owed	Net income
2	111111111	\$50,000.00	\$10,000.00	\$40,000.00
3	111111112	\$60,000.00	\$12,000.00	\$48,000.00

- (More on this later)

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Using Pre-Created Formulas

- Entering pre-created formulas, refer again to a previous example: functions

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Sample Data

	A	B	C	D	E	F	G	H	I	J
1	Raw data					Functions (sum, round)				
2	Fighter	Wins	Losses	Ties		Total fights (sum)	Win ratio (round)			
3	The X	10	10	10		30	0.3		SUM(B3:D3)	ROUND(B3/F3,1)
4	The Jet	50	20	1		71	0.7		etc	
5	The Bullet	100	17	0		117	0.9		etc	
6	The The	65	13	2		80	0.8		etc	
7										
8	Functions (average, trunc)									
9	Averages (real)	56.25	15	3.25		AVERAGE(B3:B6)	AVERAGE(C3:C6)	AVERAGE(D3:D6)		
10	Averages (whole)	56	15	3		TRUNC(B9)	etc	etc		
11										
12	Functions (count, counta, countblank)									
13	Counting numbers	12				COUNT(A1:D6)				
14	Counting text or numbers	21				COUNTA(A1:D6)				
15	Counting empty	3				COUNTBLANK(A1:D6)				
16										
17										
18	Functions (min,max)									
19	Lowest	10	10	0		MIN(B3:B6)	etc	etc		
20	Highest	100	20	10		MAX(B3:B6)	etc	etc		
21										
22										
23	Last modified (day)	2016-09-22								
24	Last modified (day/time)	2016-09-22 18:37								
25										

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SUM (Col F), ROUND (Col G)

	A	B	C	D	E	F	G
1	Raw data					Functions (sum, round)	
2	Fighter	Wins	Losses	Ties		Total fights (sum)	Win ratio (round)
3	The X	10	10	10		30	0.3
4	The Jet	50	20	1		71	0.7
5	The Bullet	100	17	0		117	0.9
6	The The	65	13	2		80	0.8
7							
8	Functions (average, trunc)					Explanations of formulas (Col B - D: Row 9 - 10)	
9	Averages (real)	56.25	15	3.25		AVERAGE(B3:B6)	AVERAGE(C3:C6)
10	Averages (whole)	56	15	3		TRUNC(B9)	etc.
11							
12							
13	Functions (count, counta, countblank)					Explanations of formulas (Col B: Row 14 - 16)	
14	Counting numbers	12				COUNT(A1:D6)	
15	Counting non empty	21				COUNTA(A1:D6)	
16	Counting empty	3				COUNTBLANK(A1:D6)	
17							
18	Functions (min,max)					Explanations of formulas (Col B - D, Row 19 - 20)	
19	Lowest	10	10	0		MIN(B3:B6)	etc.
20	Highest	100	20	10		MAX(B3:B6)	etc.
21							
22							
23	Last modified (day)	5/21/2019					
24	Last modified (day/time)	5/21/2019 17:35					

MS-Ex

AVERAGE, TRUNC

(Average: Row 9, Trunc: Row 10 – Truncates the averages from Row 9)

	A	B	C	D	E	F	G
1	Raw data					Functions (sum, round)	
2	Fighter	Wins	Losses	Ties		Total fights (sum)	Win ratio (round)
3	The X	10	10	10		30	0.3
4	The Jet	50	20	1		71	0.7
5	The Bullet	100	17	0		117	0.9
6	The The	65	13	2		80	0.8
7							
8	Functions (average, trunc)					Explanations of formulas (Col B - D: Row 9 - 10)	
9	Averages (real)	56.25	15	3.25		AVERAGE(B3:B6)	AVERAGE(C3:C6)
10	Averages (whole)	56	15	3		TRUNC(B9)	etc.
11							
12							
13	Functions (count, counta, countblank)					Explanations of formulas (Col B: Row 14 - 16)	
14	Counting numbers	12				COUNT(A1:D6)	
15	Counting non empty	21				COUNTA(A1:D6)	
16	Counting empty	3				COUNTBLANK(A1:D6)	
17							
18	Functions (min,max)					Explanations of formulas (Col B - D, Row 19 - 20)	
19	Lowest	10	10	0		MIN(B3:B6)	etc.
20	Highest	100	20	10		MAX(B3:B6)	etc.
21							
22							
23	Last modified (day)	5/21/2019					
24	Last modified (day/time)	5/21/2019 17:35					

MS-I

Counting functions (Col B, Rows 14 - 16)

(Count: Row 14, CountA: Row 15, CountBlank: Row 16)

	A	B	C	D	E	F	G
1	Raw data					Functions (sum, round)	
2	Fighter	Wins	Losses	Ties		Total fights (sum)	Win ratio (round)
3	The X	10	10	10		30	0.3
4	The Jet	50	20	1		71	0.7
5	The Bullet	100	17	0		117	0.9
6	The The	65	13	2		80	0.8
7							
8	Functions (average, trunc)					Explanations of formulas (Col B - D: Row 9 - 10)	
9	Averages (real)	56.25	15	3.25		AVERAGE(B3:B6)	AVERAGE(C3:C6)
10	Averages (whole)	56	15	3		TRUNC(B9)	etc.
11							
12							
13	Functions (count, counta, countblank)					Explanations of formulas (Col B: Row 14 - 16)	
14	Counting numbers	12				COUNT(A1:D6)	
15	Counting non empty	21				COUNTA(A1:D6)	
16	Counting empty	3				COUNTBLANK(A1:D6)	
17							
18	Functions (min,max)					Explanations of formulas (Col B - D, Row 19 - 20)	
19	Lowest	10	10	0		MIN(B3:B6)	etc.
20	Highest	100	20	10		MAX(B3:B6)	etc.
21							
22							
23	Last modified (day)	5/21/2019					
24	Last modified (day/time)	5/21/2019 17:35					

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MIN, MAX (Row 19 – 20, Col B - D)

	A	B	C	D	E	F	G
1	Raw data					Functions (sum, round)	
2	Fighter	Wins	Losses	Ties		Total fights (sum)	Win ratio (round)
3	The X	10	10	10		30	0.3
4	The Jet	50	20	1		71	0.7
5	The Bullet	100	17	0		117	0.9
6	The The	65	13	2		80	0.8
7							
8	Functions (average, trunc)					Explanations of formulas (Col B - D: Row 9 - 10)	
9	Averages (real)	56.25	15	3.25		AVERAGE(B3:B6)	AVERAGE(C3:C6)
10	Averages (whole)	56	15	3		TRUNC(B9)	etc.
11							
12							
13	Functions (count, counta, countblank)					Explanations of formulas (Col B: Row 14 - 16)	
14	Counting numbers	12				COUNT(A1:D6)	
15	Counting non empty	21				COUNTA(A1:D6)	
16	Counting empty	3				COUNTBLANK(A1:D6)	
17							
18	Functions (min,max)					Explanations of formulas (Col B - D, Row 19 - 20)	
19	Lowest	10	10	0		MIN(B3:B6)	etc.
20	Highest	100	20	10		MAX(B3:B6)	etc.
21							
22							
23	Last modified (day)	5/21/2019					
24	Last modified (day/time)	5/21/2019 17:35					

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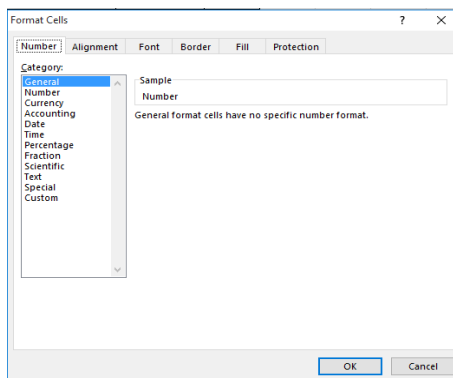
Time Information: TODAY (B23), NOW (B24)

	A	B	C	D	E	F	G
1	Raw data					Functions (sum, round)	
2	Fighter	Wins	Losses	Ties		Total fights (sum)	Win ratio (round)
3	The X	10	10	10		30	0.3
4	The Jet	50	20	1		71	0.7
5	The Bullet	100	17	0		117	0.9
6	The The	65	13	2		80	0.8
7							
8	Functions (average, trunc)					Explanations of formulas (Col B - D: Row 9 - 10)	
9	Averages (real)	56.25	15	3.25		AVERAGE(B3:B6)	AVERAGE(C3:C6)
10	Averages (whole)	56	15	3		TRUNC(B9)	etc.
11							
12							
13	Functions (count, counta, countblank)					Explanations of formulas (Col B: Row 14 - 16)	
14	Counting numbers	12				COUNT(A1:D6)	
15	Counting non empty	21				COUNTA(A1:D6)	
16	Counting empty	3				COUNTBLANK(A1:D6)	
17							
18	Functions (min,max)					Explanations of formulas (Col B - D, Row 19 - 20)	
19	Lowest	10	10	0		MIN(B3:B6)	etc.
20	Highest	100	20	10		MAX(B3:B6)	etc.
21							
22							
23	Last modified (day)	5/21/2019					
24	Last modified (day/time)	5/21/2019 17:35					

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Setting The Format Of Cell Data

- Example spreadsheet: data_types
- Setting the data type (again right click and select 'Format Cells')
- Reminder: The 'Number' tab is the default selection



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Examples Of Different Types

	A	B	C
1	Data type	Examples	
2	Number	123.45	22.50
3	Currency	\$999.99	-\$777.00
4	Accounting	\$ 12.35	-\$ 12.35
5	Percentage	80.00%	
6	Fraction	1/4	
7	Scientific	3.33E-01	
8	Text (default: left align)	-12.35	
9	Special (regular phone number)	123-4567	
10	Custom (HK format phone number)	1-234567	

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Conditional Formatting

- **Example spreadsheet:** conditional_formatting
- It can be used to visually highlight data which has met a certain condition (e.g. 6 figure sales volume or higher in 2017).

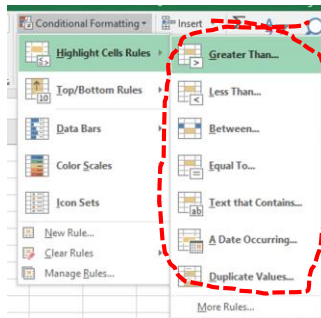
	A	B
1	Employee	2017 sales in \$
2	James	\$100,000
3	Dave	\$123,456
4	Ernie	\$55,000
5	Ron	\$66,000
6	Don	\$118,000
7	Lucie	\$75,000

- Can either be used to:
 - Assign specific colors *when a condition is met* (e.g. red for all finance employees and blue for marketing)
 - Assign a range or gradient of colors depending upon *to what degree* that a condition is met (e.g. red for high income, darker for higher values)

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Setting Conditional Formatting

- Home -> Styles: Conditional formatting



If you don't know much about visual design then keep it simple, stick to the basics (highlighting only if a condition is met rather than setting gradients for the degree to which a condition is met)

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Conditional Formatting Exercise

- **Student exercise:** modify spreadsheet “conditional_formatting_exercise” so that the cells are colored under the following conditions:
 - Time is less than 240 seconds
 - Age is greater than 50 years
- *One example solution*

	A	B	C
1	Runner	Time	Age
2	Roadrunner	233	24
3	Roadkill	239	18
4	Bugsy	220	21
5	Speedy	347	25
6	Shoeman	421	50
7	Quigly	420	88
8	Taman	240	35

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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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