

# Week 3 - Lab 1: Analysis, Forecasting, Sorting and Filtering

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# Overview

- In this tutorial, we will practice:
  - Analysis and Forecasting
  - Sorting
  - Filtering

# Analysis and Forecasting

- In this section, we will use the Excel skills we learned in the previous tutorials to do some analysis on data and to forecast future changes of data.
- For Analysis: use Summary calculations and explain models.

# Analysis and Forecasting – Example

- Goal1: perform a **compound interest calculation**.
- A compound interest is the amount of money earned on a deposit during a period of time.
- Equation: It can be calculated using the following formula:  
$$P = C (1 + r/n)^{nt}$$
  - P = future value
  - C = initial deposit
  - r = interest rate (expressed as a fraction e.g. 0.06 = 6%)
  - n = # of times per year interest is compounded
  - t = number of years invested.

# Analysis and Forecasting – Example

- Design the Excel sheet such that it is **easy to read and make modifications**.
- Divide it into sections:
  - Equation/Formula
  - Legend
  - Parameters
  - Variables and Results

# Analysis and Forecasting – Example

## Compound Interest Equation

$$\text{Formula: } P = C(1 + r/n)^{(nt)}$$

### Legend

P = Future value

C = initial deposit

r = interest rate (expressed as a fraction: eg. 0.06)

n = # of times per year interest is compounded

t = number of years invested

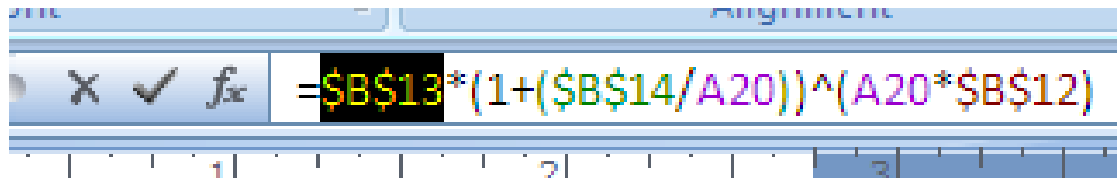
<b>Years Invested (t):</b>		1
<b>Initial Deposit (C):</b>	\$	10,000.00
<b>Interest Rate (r):</b>		6%

Note the cell formats depending on the type of data.

# Analysis and Forecasting – Example

<b>Demonstrations of Various Compounding</b>		
<b>Compounded(n)</b>		<b>Final Principal (P)</b>
1	(Yearly)	\$ 10,600.00
2	(Semi-Annually)	\$ 10,609.00
4	(Quarterly)	\$ 10,613.64
12	(Monthly)	\$ 10,616.78
52	(Weekly)	\$ 10,618.00
365	(Daily)	\$ 10,618.31

# Analysis and Forecasting – Example



11
12
13
14

Years Invested (t):	1
Initial Deposit (C):	\$ 10,000.00
Interest Rate (r):	6%

Compounded(n)		Final Principal (P)
1	(Yearly)	\$ 10,600.00
2	(Semi-Annually)	\$ 10,609.00
4	(Quarterly)	\$ 10,613.64
12	(Monthly)	\$ 10,616.78
52	(Weekly)	\$ 10,618.00
365	(Daily)	\$ 10,618.31



# Analysis and Forecasting – Example

- Goal2: perform a **Continuous Compounding Interest** calculation.
- Equation:  $P = C e^{(rt)}$ 
  - e = mathematical constant (EXP(1))
  - P = future value
  - C = initial deposit
  - r = interest rate (expressed as a fraction e.g. 0.06 = 6%)
  - t = number of years invested.

# Analysis and Forecasting – Example

<b>Demonstration of Continuous Compounding</b>	
Formula: $P = C e^{(rt)}$	
<b>Legend</b>	
e = Mathematical Constant (e = 2.71828 18284 59045 23536...)	
<b>Compounded(n)</b>	<b>Final Principal (P)</b>
Continuous	=B\$13*EXP(1)^(B\$14)

# Sorting

- In Excel you can sort textual and numerical data.

	A2
	A
1	Employee Name
2	Martin
3	John
4	Jessica
5	Jamie
6	David
7	Dane
8	Andrew
9	Alice
10	Albert
11	

→

	A1
	A
1	Employee Name
2	Albert
3	Alice
4	Andrew
5	Dane
6	David
7	Jamie
8	Jessica
9	John
10	Martin
11	

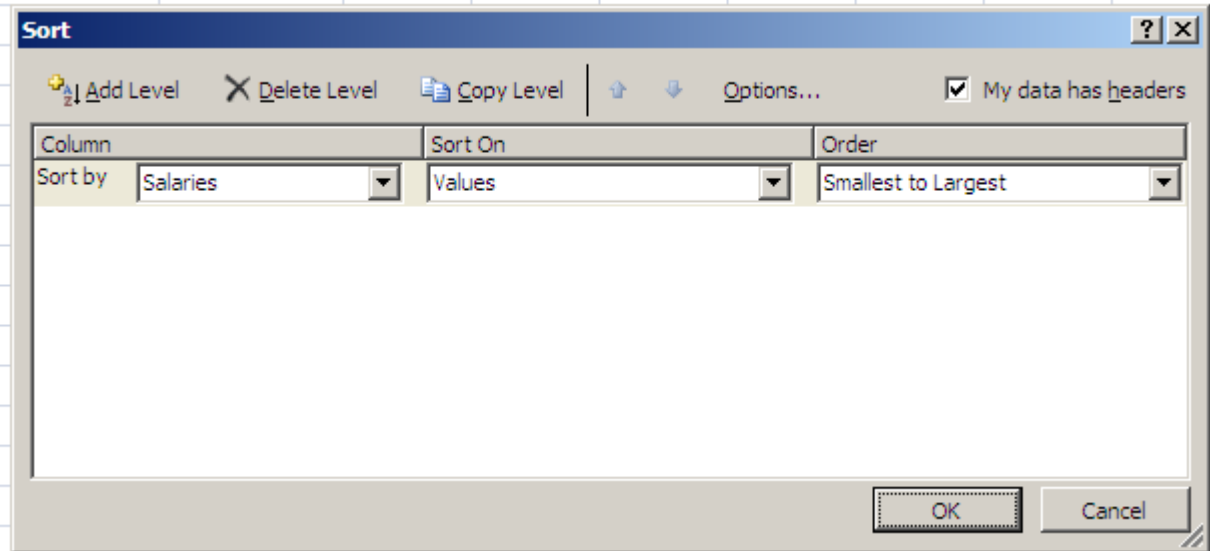
The screenshot shows the Excel ribbon with the 'Data' tab selected. The 'Sort & Filter' group is visible, containing buttons for 'Sort' (A-Z and Z-A), 'Filter', 'Clear', 'Reapply', and 'Advanced'. A tooltip is displayed over the 'Sort' button, titled 'Sort A to Z', with the text: 'Sort the selection so that the lowest values are at the top of the column.' and a link to 'Press F1 for more help.'

# Sorting

	A
1	Salaries
2	300
3	200
4	400
5	120
6	600
7	430
8	80
9	60
10	90
11	

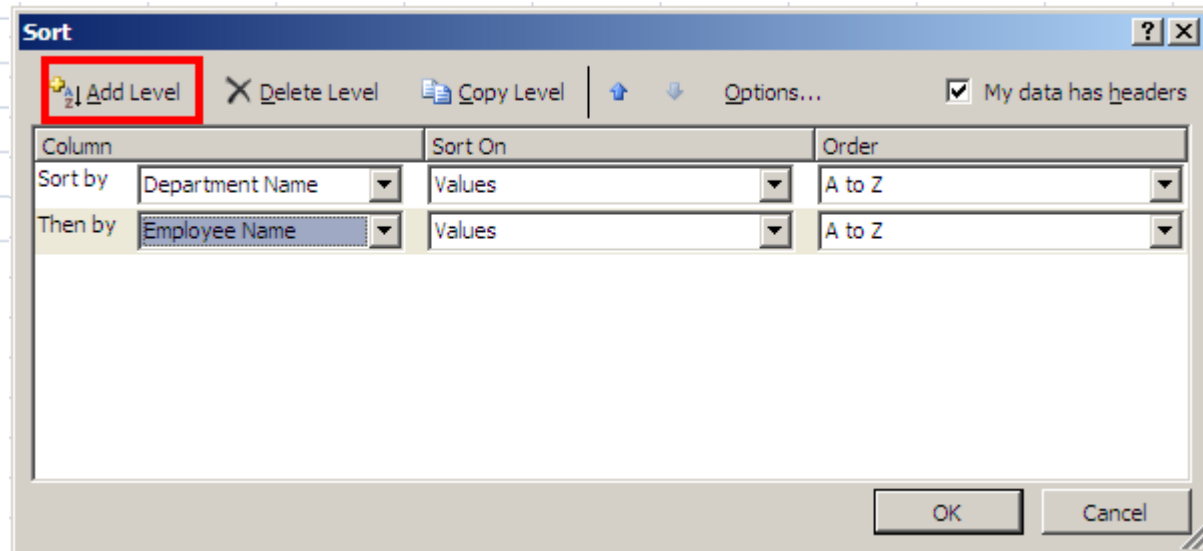
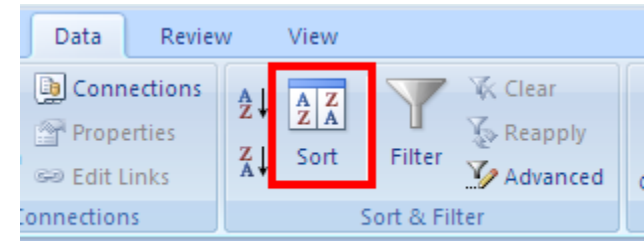


	A
1	Salaries
2	60
3	80
4	90
5	120
6	200
7	300
8	400
9	430
10	600
11	



# Sorting

	A	B
1	Department Name	Employee Name
2	Finance	Mark
3	Sales	Jessica
4	Human Resources	Martin
5	Finance	Albert
6	Customer Services	Dane
7	Finance	David
8	Customer Services	Andrew
9	Sales	Jamie
10	Finance	John
11	Customer Services	Jonathan
12		

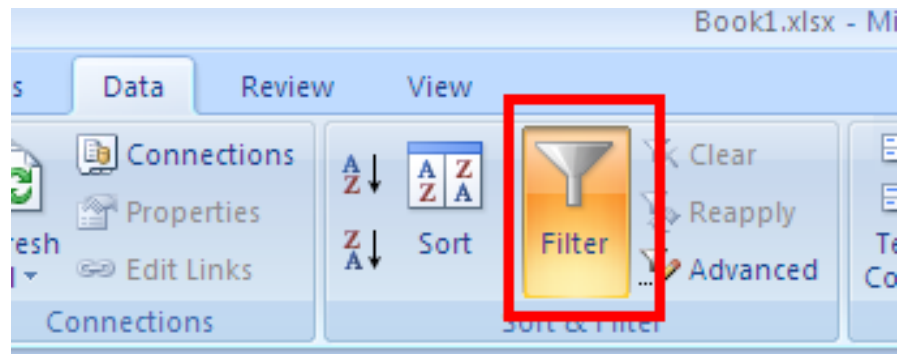
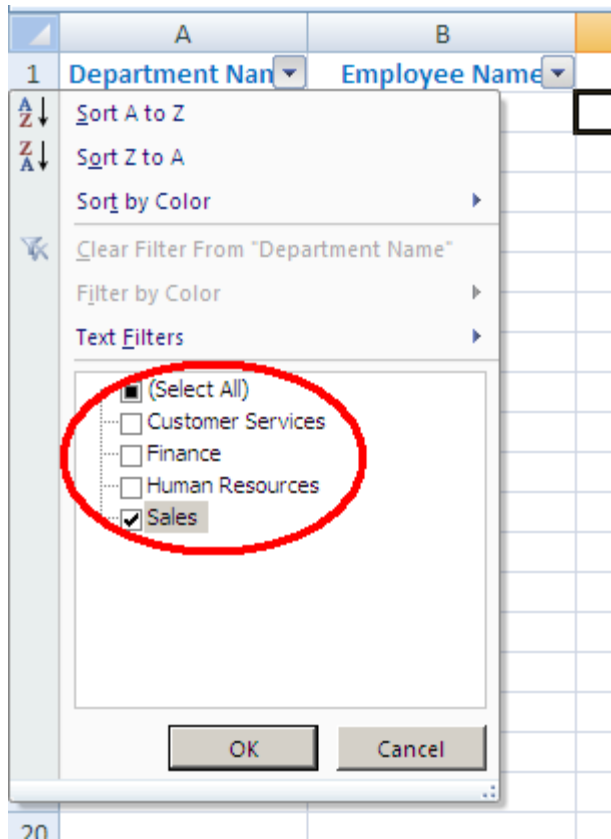


↓

	A	B
1	Department Name	Employee Name
2	Customer Services	Andrew
3	Customer Services	Dane
4	Customer Services	Jonathan
5	Finance	Albert
6	Finance	David
7	Finance	John
8	Finance	Mark
9	Human Resources	Martin
10	Sales	Jamie
11	Sales	Jessica

# Filtering

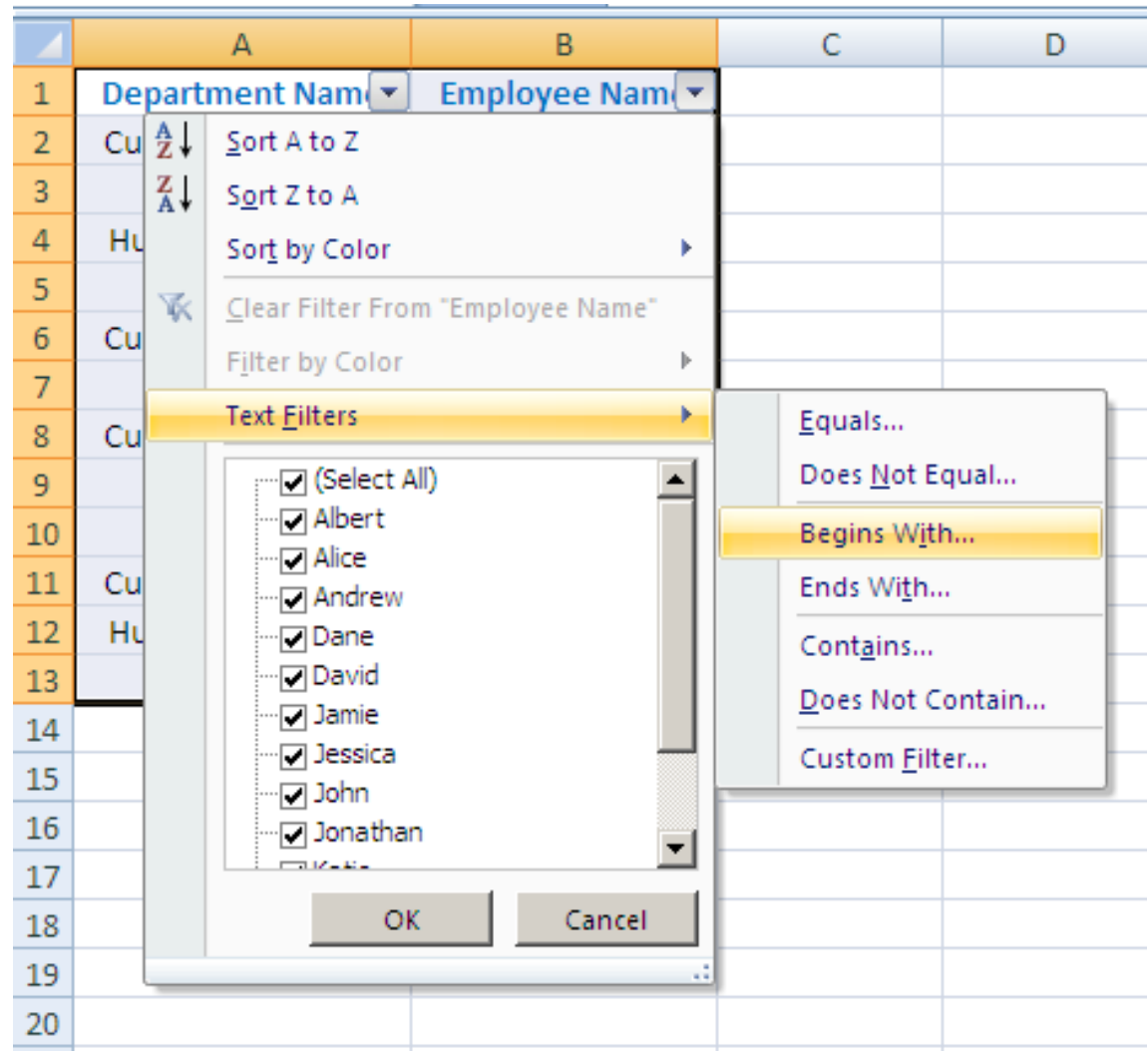
- Used to display part of the data according to some criteria.



	A	B
1	Department Name	Employee Name
10	Sales	Jamie
11	Sales	Jessica
12		

# Customized Filters

- To display only the names of employees that start with an "A"



# Customized Filters

	A	B
1	Department Name	Employee Name
2	Customer Services	Andrew
3	Customer Services	Dane
4	Customer Services	Jonathan
5	Finance	Albert
6	Finance	David
7	Finance	John
8	Finance	Mark
9	Human Resources	Martin
10	Sales	Jamie
11	Sales	Jessica
12		

**Custom AutoFilter** [?] [X]

Show rows where:  
Employee Name \_\_\_\_\_

begins with [ ] [A] [ ]

And  Or

[ ] [ ]

Use ? to represent any single character  
Use \* to represent any series of characters

OK Cancel

G19 [ ] fx

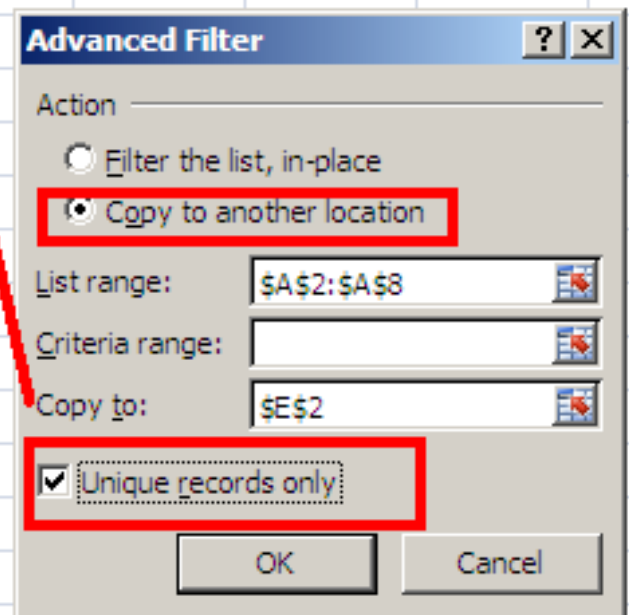
	A	B
1	Department Name	Employee Name
2	Customer Services	Andrew
5	Finance	Albert
12		



# Filtering for Unique Values

	A	B
1	Department Name	Employee Name
2	Finance	Mark
3	Sales	Jessica
4	Human Resources	Martin
5	Customer Services	Dane
6	Customer Services	Andrew
7	Sales	Jamie
8	Customer Services	Jonathan

Unique Departments Names



The Advanced Filter dialog box is shown with the following settings:

- Action:  Copy to another location
- List range: \$A\$2:\$A\$8
- Criteria range: (empty)
- Copy to: \$E\$2
- Unique records only

Buttons: OK, Cancel

# Filtering for Unique Values

	A	B	C	D	E
1	Department Name	Employee Name			<b>Unique Departments Names</b>
2	Finance	Mark			Finance
3	Sales	Jessica			Sales
4	Human Resources	Martin			Human Resources
5	Customer Services	Dane			Customer Services
6	Customer Services	Andrew			
7	Sales	Jamie			
8	Customer Services	Jonathan			
9					

# Next: Review

- Next Tutorial is a review session
- Practice and be prepared to ask questions.