Lab Excel 3

Homework 1 – Rebar Table

1. Start Microsoft Excel 2013
2. Save the current workbook in a file under the name **Homework3** in **My Documents** folder
3. Rename **Sheet1** in **Rebar**
4. Fill out the sheet as in the figure below

	A	B	C	D	E	F	G
1	Mark	Length	Qty	Φ	Φ8	Φ10	Φ12
2	1	5.25	4	8			
3	2	7.05	8	10			
4	3	2.55	10	10			
5	4	3.25	12	12			
6	5	4	2	12			
7	6	1.5	20	10			
8	7	10.5	2	10			
9	8	11.25	20	12			
10	9	0.75	40	8			
11	10	5	4	12			
12				Total by Φ [m]			
13				Weight/m	0.395	0.617	0.888
14				Weight by Φ [kg]			
15				Total Weight [kg]			

5. Enter the formula **=IF(D2=8,B2*C2,"")** in cell **E2**
6. Copy this formula down in the range **E2:E11** using the **Copy Fill Handle**
7. Do the same for the next two columns Φ10 and Φ12, but changing the condition in the IF function, respectively 10 and 12
8. Sum up the lengths of the bars by diameter in cells E12, F12, G12
9. Add the formula to calculate the Weight by diameter **=E12*E13** in cell **E14**. Do the same for the next two columns.
10. Sum up the three weights in cell **F15**. In the end, the table should look like below.

	A	B	C	D	E	F	G
1	Mark	Length	Qty	Φ	Φ8	Φ10	Φ12
2	1	5.25	4	8	21		
3	2	7.05	8	10		56.4	
4	3	2.55	10	10		25.5	
5	4	3.25	12	12			39
6	5	4	2	12			8
7	6	1.5	20	10		30	
8	7	10.5	2	10		21	
9	8	11.25	20	12			225
10	9	0.75	40	8	30		
11	10	5	4	12			20
12				Total by Φ [m]	51	132.9	292
13				Weight/m	0.395	0.617	0.888
14				Weight by Φ [kg]	20.145	81.9993	259.296
15				Total Weight [kg]		361.4403	

Homework 2 – Rainfall in an area

1. Add a new sheet in the current workbook
2. Rename **Sheet2** in **Rainfall**
3. Fill out the table like below.

	A	B	C	D
1	Year	Rainfall	Difference	Alerts
2	2010	45		
3	2011	23		
4	2012	33		
5	2013	47		
6	2014	26		
7	2015	55		
8	2016	44		
9	2017	23		
10	Average			

4. Add the formula to calculate the mean rainfall between years 2010 – 2017 in cell **B10**
5. Add the formula to calculate the difference between the current year and the average in the cell **C2**.

! Pay attention to absolute references when entering the formula in cell C2.

6. Copy down the formula using the **Fill Handle**.
7. Add a formula in cell D2 to show an alert "drought" when the difference is negative.

! Use the **=IF()** function with the condition that the difference is less than zero.

8. In the end, the table should look like below.

	A	B	C	D
1	Year	Rainfall	Difference	Alerts
2	2010	45	8	
3	2011	23	-14	drought
4	2012	33	-4	drought
5	2013	47	10	
6	2014	26	-11	drought
7	2015	55	18	
8	2016	44	7	
9	2017	23	-14	drought
10	Average	37		

9. Create a Column chart using the data from columns A (Year) and C (Difference).
10. Format the chart like in the figure below.
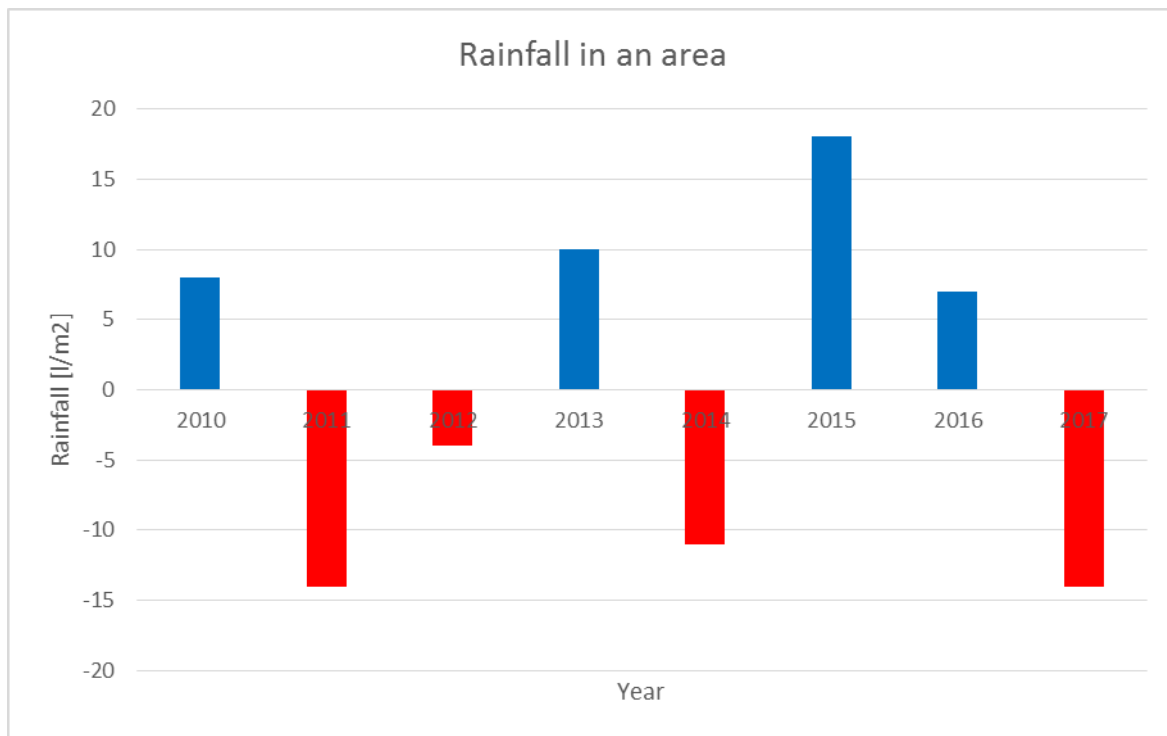
Rainfall in an area

Format Data Series

HINT. To format the columns with different colors when negative, select the data series. In the **Format Data Series** pane, select **Fill** and from the group of options select **Solid fill** and check the checkbox **Invert if negative**. Select the colors from the two dropdown color lists.

Homework 3 – Calculation of the Bending moment M and Shear force T on a simply supported beam.

1. Add a new sheet in the current workbook
2. Rename **Sheet3** in **Beam**
3. Fill out the table like below.

	A	B	C
1	x	M	T
2	0		
3	0.2		
4	0.4		
5	0.6		
6	0.8		
7	1		
19	3.4		
20	3.6		
21	3.8		
22	4		
23			
24	p	10	
25	V	20	

The formulae for calculating the bending moment M and shear force T are:

$$M = V \cdot x - p \cdot \frac{x^2}{2}$$

$$T = V - p \cdot x$$

4. Fill out the formulae to calculate the bending moment in column **B** and shear force in column **C**.
5. Copy the two formulae downward using the **Fill Handle**.

❗ Pay attention to absolute references when entering the formulae in columns **B** and **C**.

6. In the end, the table should look like below.

	A	B	C
1	x	M	T
2	0	0	20
3	0.2	3.8	18
4	0.4	7.2	16
5	0.6	10.2	14
6	0.8	12.8	12
7	1	15	10
19	3.4	10.2	-14
20	3.6	7.2	-16
21	3.8	3.8	-18
22	4	0	-20
23			
24	p	10	
25	V	20	

7. Create a Scatter chart using the data in the three columns (A – C) and format it like in the figure below.
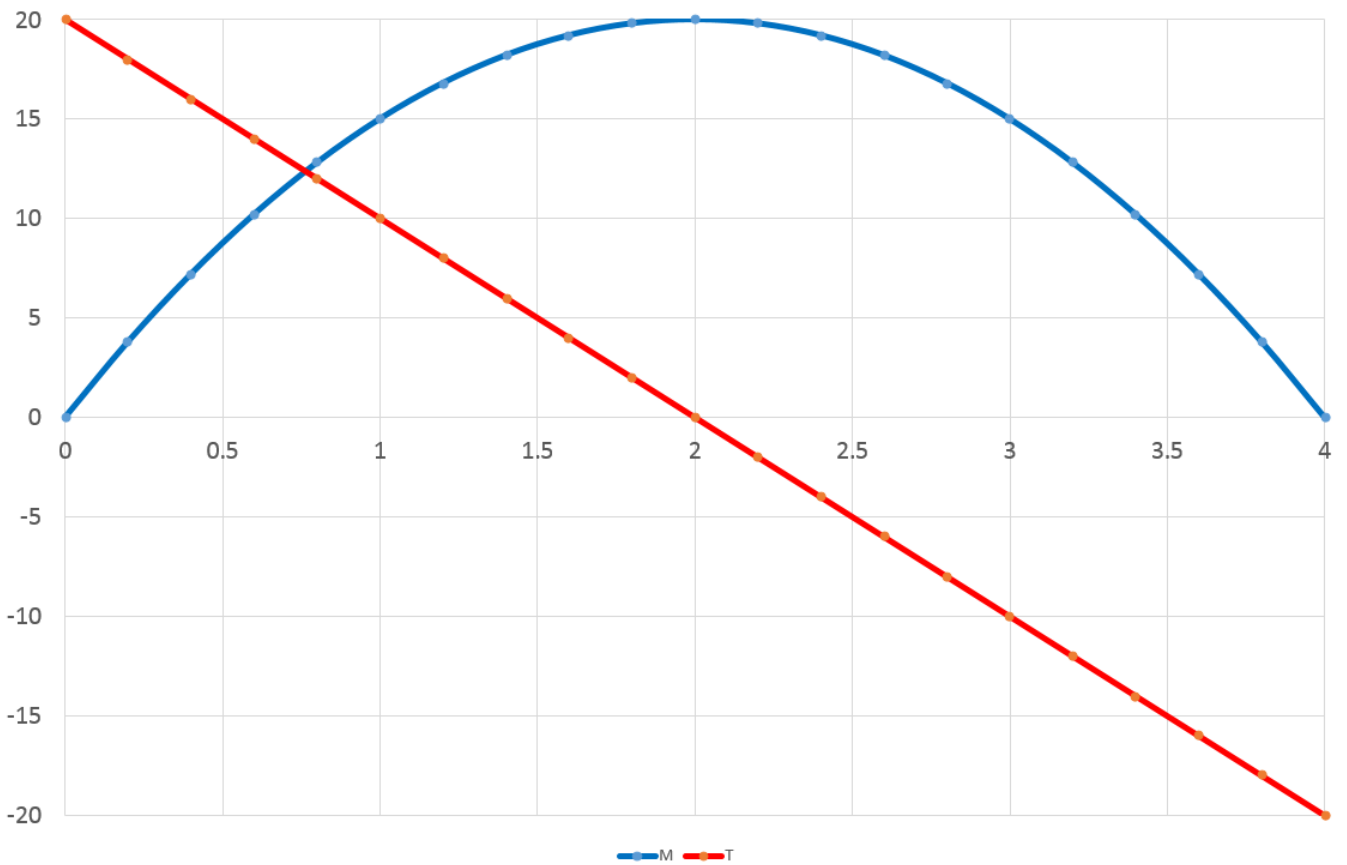
Homework 4 – Lookup values in a range

1. Add a new sheet in the current workbook
2. Rename **Sheet4** in **Profile**
3. Fill out the table like below.

	A	B	C	D	E	F
1	Profil	Aria	h	b		
2	IPE 240	39.1	240	120		
3	IPE 270	45.9	270	135		
4	IPE 300	53.8	300	150		
5	IPE 330	62.6	330	160		
6						
7	Profil	Aria	h	b	fy	N
8					355	

4. Move the cursor in cell **A8** activate the **DATA** tab and from the **Data Tools** group select the **Data Validation...** command.
5. In the opened dialog box, select **List** from the dropdown **Allow**: and select the range **A2:A5** as source for the validation criteria.
6. Press OK
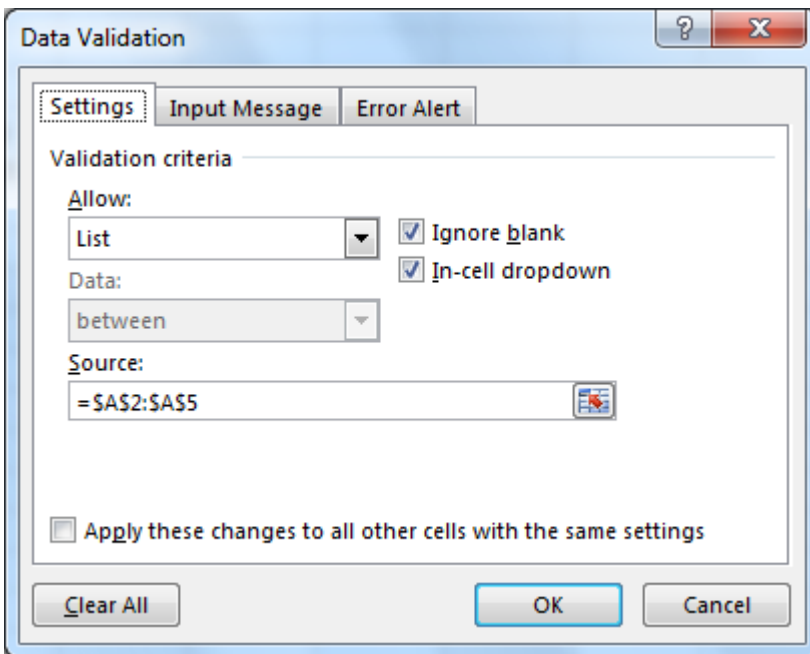
ℹ️ Excel has added a dropdown list in cell **A8**, having four items from the range i.e. IPE240 ... IPE330.

We will use **VLOOKUP** to extract the values from table A1:D5, using the lookup value from the first column.

Use VLOOKUP, one of the lookup and reference functions, when you need to find things in a table or a range by row. For example, look up a price of an automotive part by the part number.

In its simplest form, the VLOOKUP function says:

=VLOOKUP(Value you want to look up, range where you want to lookup the value, the column number in the range containing the return value, Exact Match or Approximate Match – indicated as 0/FALSE or 1/TRUE).

7. Move the cursor in cell **B8** and enter the formula **=VLOOKUP(A8,A2:D5,2)**
8. Move the cursor in cell **C8** and enter the formula **=VLOOKUP(A8,A2:D5,3)**
9. Move the cursor in cell **D8** and enter the formula **=VLOOKUP(A8,A2:D5,4)**
10. The table should look like below if you select IPE300 from the dropdown list in cell **A8**.

	A	B	C	D	E	F
1	Profil	Aria	h	b		
2	IPE 240	39.1	240	120		
3	IPE 270	45.9	270	135		
4	IPE 300	53.8	300	150		
5	IPE 330	62.6	330	160		
6						
7	Profil	Aria	h	b	fy	N
8	IPE 300	53.8	300	150	355	

11. Finish up the homework by adding the formula Aria x fy in cell **F8** (**=B8*E8**)