Spreadsheet (Excel, LibreOffice, etc.) Functions*

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Contents

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*This document is prepared for educational purposes only in the information technology course series at Istanbul University, Faculty of Economics. The content includes formulas and functions commonly used in spreadsheet software such as Microsoft Excel, LibreOffice, and Google Sheets, etc. The notes are for those who already participated in the related courses. The source code of this content is available at `https://github.com/jbytecode/sampledbs` in LATEX format. [2] and [1] are used as references.

1 Rounding Functions

1.1 ROUND

	A	B	C	D	E	F
1		=ROUND(1.1234; 3)				
2						

`1.123`

	A	B	C	D	E	F
1		=ROUND(1.1237; 3)				
2						

`1.124`

1.2 ROUNDUP

	A	B	C	D	E	F
1		=ROUNDUP(1.1234; 3)				
2						

`1.124`

	A	B	C	D	E	F
1		=ROUNDUP(1.1237; 3)				
2						

`1.124`

1.3 ROUNDDOWN

	A	B	C	D	E	F
1		=ROUNDDOWN(1.1234; 3)				
2						

`1.123`

	A	B	C	D	E	F
1		=ROUNDDOWN(1.1237; 3)				
2						

`1.123`

1.4 INT

	A	B	C	D	E	F
1		=INT(1.1234)				
2		=INT(100.99)				

```
1
100
```

2 Mathematical Functions

2.1 SIGN

	A	B	C	D	E	F
1		=SIGN(16)				
2						

```
1
```

	A	B	C	D	E	F
1		=SIGN(-8)				
2						

```
-1
```

	A	B	C	D	E	F
1		=SIGN(0)				
2						

```
0
```

2.2 ABS

	A	B	C	D	E	F
1		=ABS(-25)				
2						

```
25
```

	A	B	C	D	E	F
1		=ABS(25)				
2						

```
25
```

2.3 POWER

	A	B	C	D	E	F
1		=POWER(2; 3)				
2						

```
8
```

	A	B	C	D	E	F
1		=POWER(10; 4)				
2						

10000

2.4 LOG

	A	B	C	D	E	F
1		=LOG(1000)				
2						

3

	A	B	C	D	E	F
1		=LOG(8; 2)				
2						

3

2.5 LN

	A	B	C	D	E	F
1		=LN(2.71828)				
2						

0.999999327347282

	A	B	C	D	E	F
1		=LN(EXP(1))				
2						

1

2.6 LOG10

	A	B	C	D	E	F
1		=LOG10(1000))				
2						

3

2.7 EXP

$$EXP(x) = e^x$$

	A	B	C	D	E	F
1		=EXP(1)				
2						

2.71828182845905

	A	B	C	D	E	F
1		=LN(EXP(2))				
2						

2

2.8 SQRT

	A	B	C	D	E	F
1		=SQRT(16)				
2						

4

2.9 PI

	A	B	C	D	E	F
1		=PI()				
2						

3.14159265358979

2.10 SIN

	A	B	C	D	E	F
1		=SIN(PI()/2)				
2						

1

2.11 COS

	A	B	C	D	E	F
1		=COS(2 * PI())				
2						

1

2.12 RADIANS

	A	B	C	D	E	F
1		=RADIANS(90)				
2						

1.5707963267949

2.13 DEGREES

	A	B	C	D	E	F
1		=DEGREES(PI()/2)				
2						

90

2.14 ISNUMBER

	A	B	C	D	E	F
1	8	=ISNUMBER(A1)				
2						

TRUE

	A	B	C	D	E	F
1	Cat	=ISNUMBER(A1)				
2						

FALSE

2.15 ISEVEN

	A	B	C	D	E	F
1	8	=ISEVEN(A1)				
2						

TRUE

	A	B	C	D	E	F
1	9	=ISEVEN(A1)				
2						

FALSE

2.16 ISODD

	A	B	C	D	E	F
1	8	=ISODD(A1)				
2						

FALSE

	A	B	C	D	E	F
1	9	=ISODD(A1)				
2						

TRUE

2.17 ISBLANK

	A	B	C	D	E	F
1		=ISBLANK(A1)				
2						

TRUE

	A	B	C	D	E	F
1	Cats	=ISBLANK(A1)				
2						

FALSE

2.18 ISERROR

	A	B	C	D	E	F
1		= 9/0				
2		= ISERROR(A1)				

`A2 = TRUE`

	A	B	C	D	E	F
1		#DIV/0!				
2		= ISERROR(A1)				

`TRUE`

2.19 BASE

	A	B	C	D	E	F
1		=BASE(16; 2; 8)				
2		=BASE(255, 2; 8)				
3		=BASE(3; 2; 8)				

```
00010000
11111111
00000011
```

2.20 MOD

	A	B	C	D	E	F
1		=MOD(5; 2)				
2		=MOD(10; 9)				
3		=MOD(8; 3)				

```
1
1
2
```

2.21 ROMAN

	A	B	C	D	E	F
1		=ROMAN(1453)				
2		=ROMAN(2025)				
3		=ROMAN(8)				
4		=ROMAN(105)				
5		=ROMAN(50)				

```
MCDLIII
MMXXV
VIII
CV
L
```

2.22 Function Composition

2.22.1 Example 1

`=SQRT(POWER(3;2) + POWER(4;2))`

Answer:

`5`

2.22.2 Example 2

`=LOG10(POWER(10;4))`

Answer:

`4`

2.22.3 Example 3

`=ROUNDUP(SQRT(50);3)`

Answer:

`7.072`

2.22.4 Example 4

`=ABS(MOD(29;6))`

Answer:

`5`

3 Statistical Functions

3.1 MIN

	A	B	C	D	E	F
1	5					
2	7					
3	12					
4	11					
5	=MIN(A1:A4)					

`5`

3.2 MAX

	A	B	C	D	E	F
1	5					
2	7					
3	12					
4	11					
5	=MAX(A1:A4)					

`12`

3.3 VAR

	A	B	C	D	E	F
1	5					
2	7					
3	12					
4	11					
5	=VAR(A1:A4)					

10.9166666666667

3.4 STDEV

	A	B	C	D	E	F
1	5					
2	7					
3	12					
4	11					
5	=STDEV(A1:A4)					

3.30403793359984

3.5 SUM

	A	B	C	D	E	F
1	5					
2	7					
3	12					
4	11					
5	=SUM(A1:A4)					

35

3.6 PRODUCT

	A	B	C	D	E	F
1	5					
2	7					
3	12					
4	11					
5	=PRODUCT(A1:A4)					

4620

3.7 SUMPRODUCT

	A	B	C	D	E	F
1	5	4				
2	7	0				
3	12	2				
4	11	3				
5	=SUMPRODUCT(A1:A4; B1:B4)					

77

3.8 AVERAGE

	A	B	C	D	E	F
1	5					
2	7					
3	12					
4	11					
5	=AVERAGE(A1:A4)					

```
8.75
```

3.9 COUNT

	A	B	C	D	E	F
1	5					
2	7					
3	12					
4	11					
5	=COUNT(A1:A4)					

```
4
```

3.10 MEDIAN

	A	B	C	D	E	F
1	5					
2	7					
3	12					
4	11					
5	=MEDIAN(A1:A4)					

```
9.0
```

3.11 PERCENTILE

	A	B	C	D	E	F
1	5					
2	7					
3	12					
4	11					
5	=PERCENTILE(A1:A4; 0)					

```
5
```

	A	B	C	D	E	F
1	5					
2	7					
3	12					
4	11					
5	=PERCENTILE(A1:A4; 1)					

```
12
```

	A	B	C	D	E	F
1	5					
2	7					
3	12					
4	11					
5	=PERCENTILE(A1:A4; 0.5)					

9

	A	B	C	D	E	F
1	5					
2	7					
3	12					
4	11					
5	=PERCENTILE(A1:A4; 0.25)					

6.5

	A	B	C	D	E	F
1	5					
2	7					
3	12					
4	11					
5	=PERCENTILE(A1:A4; 0.75)					

11.25

3.12   QUARTILE

	A	B	C	D	E	F
1	5					
2	7					
3	12					
4	11					
5	=QUARTILE(A1:A4; 0)					

5

	A	B	C	D	E	F
1	5					
2	7					
3	12					
4	11					
5	=QUARTILE(A1:A4; 1)					

6.5

	A	B	C	D	E	F
1	5					
2	7					
3	12					
4	11					
5	=QUARTILE(A1:A4; 2)					

9

	A	B	C	D	E	F
1	5					
2	7					
3	12					
4	11					
5	=QUARTILE(A1:A4; 3)					

11.25

	A	B	C	D	E	F
1	5					
2	7					
3	12					
4	11					
5	=QUARTILE(A1:A4; 4)					

12

3.13 SKEW

	A	B	C	D	E	F
1	5					
2	7					
3	12					
4	11					
5	=SKEW(A1:A4)					

-0.592518588276328

	A	B	C	D	E	F
1	5					
2	7					
3	12					
4	11					
5	=KURT(A1:A4)					

-3.86900530272129

3.14 CORREL

	A	B	C	D	E	F
1	5	10				
2	7	14				
3	12	24				
4	11	22				
5	=CORREL(A1:A4; B1:B4)					

1

	A	B	C	D	E	F
1	5	22				
2	7	24				
3	12	14				
4	11	10				
5	=CORREL(A1:A4; B1:B4)					

```
-0.862595419847328
```

3.15   FACT

	A	B	C	D	E	F
1	=FACT(5)					
2						

```
120
```

3.16   COMBIN

	A	B	C	D	E	F
1	=COMBIN(5; 2)					
2						

$$\text{nCr} = \frac{n!}{r!(n-r)!} = \frac{5!}{2!(5-2)!} = \frac{5 \times 4 \times 3!}{2 \times 1 \times 3!} = \frac{20}{2} = 10$$

```
10
```

3.17   SUMSQ

	A	B	C	D	E	F
1	1					
2	2					
3	3					
4	4					
5	=SUMSQ(A1:A4)					

```
30
```

4   Logical Functions

4.1   AND

	A	B	C	D	E	F
1		TRUE	FALSE			
2		TRUE	TRUE			
3		FALSE	FALSE			
4		=AND(B1:C1)				
5		=AND(B2:C2)				
6		=AND(B3:C3)				

```
FALSE
TRUE
FALSE
```

4.2 OR

	A	B	C	D	E	F
1		TRUE	FALSE			
2		TRUE	TRUE			
3		FALSE	FALSE			
4		=OR(B1:C1)				
5		=OR(B2:C2)				
6		=OR(B3:C3)				

```
TRUE
TRUE
FALSE
```

4.3 NOT

	A	B	C	D	E	F
1		TRUE				
2		TRUE				
3		FALSE				
4		=NOT(B1)				
5		=NOT(B2)				
6		=NOT(B3)				

```
FALSE
FALSE
TRUE
```

4.4 XOR

	A	B	C	D	E	F
1		TRUE	FALSE			
2		TRUE	TRUE			
3		FALSE	TRUE			
4		FALSE	FALSE			
5		=XOR(B1:C1)				
6		=XOR(B2:C2)				
7		=XOR(B3:C3)				

```
TRUE
FALSE
TRUE
FALSE
```

4.5 IF

	A	B	C	D	E	F
1	5	6	12	-1	10	
2	=IF(A1 = 5; TRUE; FALSE)					
3	=IF(AND(A1 >= 5; SIGN(D1) = -1); "YES"; "NO")					
4	=IF(AND(A1 = 5; B1 = 6; C1 > 5); "YES"; "NO")					
5	=IF(A1 < 0; "NEG"; IF(A1 = 0; "ZERO"; "POS"))					
6						
7						

```
TRUE
YES
YES
POS
```

4.5.1   IF...ELSEIF...ELSEIF...ELSE

	A	B	C	D	E	F
1	5	22				
2	7	24				

Write an IF statement to handle this situation:

- If the value in A1 is less than 10, return "LOW"

- If the value in A1 is between 10 and 20 (inclusive), return "MEDIUM"

- If the value in A1 is between 21 and 30 (inclusive), return "HIGH"

- If the value in A1 is greater than 30, return "VERY HIGH"

```
=IF(A1 < 10; "LOW";
   IF(AND(A1 >= 10; A1 <= 20); "MEDIUM";
      IF(AND(A1 >= 21; A1 <= 30); "HIGH";
         "VERY HIGH")))
```

A shorter version:

```
=IF(A1 < 10; "LOW";
   IF(A1 <= 20; "MEDIUM";
      IF(A1 <= 30; "HIGH";
         "VERY HIGH")))
```

The answer is

```
LOW
```

Use `IFS` function (if your Excel supports it):

```
=IFS(A1 < 10; "LOW";
     AND(A1 >= 10; A1 <= 20); "MEDIUM";
     AND(A1 >= 21; A1 <= 30); "HIGH";
     A1 > 30; "VERY HIGH")
```

4.5.2   How many real roots?

	A	B	C	D	E	F
1	-1	5	100			
2	=POWER(B1; 2) - 4 * A1 * C1					

Write an IF statement (indeed they are expressions in Excel) to determine how many real roots the quadratic equation $Ax^2 + Bx + C = 0$ has, based on the values in A1, B1, and C1. Return 0 (No real roots), 1 (repeated root), or 2 (two real roots).

```
=IF(B2 < 0; 0;
   IF(B2 = 0; 1; 2))
```

Use `IFS` function (if your Excel supports it):

```
=IFS(B2 < 0; 0;
     B2 = 0; 1;
     B2 > 0; 2)
```

4.5.3 How is the weather outside?

Suppose that the temperature is in cell A1 (in degrees Celsius). Write an IF statement to return the following:

- If the temperature is less than or equal to 0, return "Freezing"

- If the temperature is greater than 0 but less than or equal to 15, return "Cold"

- If the temperature is greater than 15 but less than or equal to 25, return "Warm"

- If the temperature is greater than 25 but less than or equal to 35, return "Hot"

- If the temperature is greater than 35, return "Too Hot"

```
=IF(A1 <= 0; "Freezing";
   IF(A1 <= 15; "Cold";
      IF(A1 <= 25; "Warm";
         IF(A1 <= 35; "Hot";
            "Too Hot"))))
```

Use `IFS` function (if your Excel supports it):

```
=IFS(A1 <= 0; "Freezing";
     A1 <= 15; "Cold";
     A1 <= 25; "Warm";
     A1 <= 35; "Hot";
     A1 > 35; "Too Hot")
```

4.6 IFERROR

	A	B	C	D	E	F
1	=IFERROR(9/0; "Undefined")					
2						

```
Undefined
```

5 Random Numbers

5.1 RAND

	A	B	C	D	E	F
1		=RAND()				
2						

```
// A random number between 0 and 1, e.g.
0.5432101234
```

5.2 RANDBETWEEN

	A	B	C	D	E	F
1		=RANDBETWEEN(1; 10)				
2						

```
// A random integer between 1 and 10, e.g.
// The range is inclusive, so 1 and 10 are possible outputs
7
```

6 Date and Time Functions

6.1 NOW

	A	B	C	D	E	F
1		=NOW()				
2						

01/12/25 08:10 PM

6.2 YEAR

	A	B	C	D	E	F
1		01/12/25 08:10 PM				
2		=YEAR(B1)				

2025

6.3 MONTH

	A	B	C	D	E	F
1		01/12/25 08:10 PM				
2		=MONTH(B1)				

12

6.4 DAY

	A	B	C	D	E	F
1		01/12/25 08:10 PM				
2		=DAY(B1)				

1

6.5 HOUR

	A	B	C	D	E	F
1		01/12/25 08:10 PM				
2		=HOUR(B1)				

20

6.6 MINUTE

	A	B	C	D	E	F
1		01/12/25 08:10 PM				
2		=MINUTE(B1)				

10

6.7 SECOND

	A	B	C	D	E	F
1		01/12/25 08:10 PM				
2		=SECOND(B1)				

50

7 String Functions

7.1 CHAR

	A	B	C	D	E	F
1		=CHAR(65)				
2						

A

7.2 CODE

	A	B	C	D	E	F
1		=CODE("B")				
2						

66

7.3 UNICODE

	A	B	C	D	E	F
1		=UNICODE("☺")				
2						

9786

7.4 UNICHAR

	A	B	C	D	E	F
1		=UNICHAR(9786)				
2						

Output: ☺

7.5 LOWER

	A	B	C	D	E	F
1		istanBUL				
2		=LOWER(B1)				

istanbul

7.6 UPPER

	A	B	C	D	E	F
1		istanBUL				
2		=UPPER(B1)				

`ISTANBUL`

7.7 CONCATENATE

	A	B	C	D	E	F
1		İstanbul	University			
2		=CONCATENATE(B1; C1)				

`IstanbulUniversity`

	A	B	C	D	E	F
1		İstanbul	University			
2		=CONCATENATE(B1;" "; C1)				

`Istanbul University`

7.8 LEFT

	A	B	C	D	E	F
1		İstanbul	University			
2		=LEFT(B1; 3)				

`Ist`

7.9 RIGHT

	A	B	C	D	E	F
1		İstanbul	University			
2		=RIGHT(B1; 3)				

`bul`

7.10 MID

	A	B	C	D	E	F
1		İstanbul	University			
2		=MID(B1; 6; 3)				
3		=MID(C1; 5; 2)				

`bul`
`er`

7.11   LEN

	A	B	C	D	E	F
1		İstanbul	University			
2		=LEN(B1)				
3		=LEN(C1)				

```
8
10
```

7.12   ISTEXT

	A	B	C	D	E	F
1		İstanbul	1453			
2		=ISTEXT(B1)				
3		=ISTEXT(C1)				

```
TRUE
FALSE
```

7.13   ISNONTEXT

	A	B	C	D	E	F
1		İstanbul	1453			
2		=ISNONTEXT(B1)				
3		=ISNONTEXT(C1)				

```
FALSE
TRUE
```

7.14   REPLACE

	A	B	C	D	E	F
1		İstanbul				
2		=REPLACE(A1; 4; 2; "*")				
3		=REPLACE(A1; 3; 5; "?")				

```
Is*bul
Is?l
```

7.15   SEARCH

	A	B	C	D	E	F
1		İstanbul				
2		=SEARCH("bul"; A1)				
3		=SEARCH("tan"; A1)				
4		=SEARCH("something"; A1)				

```
6
3
#VALUE!
```

7.16 VLOOKUP

Basic Usage:

```
=VLOOKUP(lookup_value; table_array; col_index_num; [range_lookup])
```

where

- `lookup_value` is the value to search for in the first column of the table_array

- `table_array` is the range of cells that contains the data

- `col_index_num` is the column number in the table_array from which to retrieve the value

- `range_lookup` is a logical value that specifies whether to find an exact match (FALSE) or an approximate match (TRUE). If omitted, TRUE is assumed

	A	B	C	D	E	F
1	2	Economics				
2	3	Industrial Relations				
3	5	Econometrics				
4	8	Business Administration				
5		=VLOOKUP(8; A1:B4; 2; FALSE)				

```
Business Administration
```

Description of the example:

- The function looks for the value 8 in the first column of the range A1:B4

- It finds the value 8 in cell A4

- It then retrieves the value from the second column of the same row, which is "Business Administration"

	A	B	C	D	E	F
1	101	Introduction to Economics	4			
2	102	Information Technologies	2			
3	103	Basic Statistics	3			
4	104	Operations Research	3			
5		=VLOOKUP(104; A1:C4; 3; FALSE)				

The output:

```
3
```

Why? Because the function looks for the value 104 in the first column of the range A1:C4, finds it in cell A4, and retrieves the value from the third column of the same row, which is 3.

8 Visual Basic for Applications (VBA)

8.1 `times` function

```
' This function returns the product of two numbers
Function times(a, b)
    times = a * b
End Function
```

Usage in Excel:

```
=times(5; 6)
```

8.2 `factorial` function

```
Rem This function returns factorial of n
Function factorial(n)
    Dim result As Long
    Dim i As Long
    result = 1

    For i = 2 To n
        result = result * i
    Next

    factorial = result
End Function
```

Usage in Excel:

```
=factorial(5)
```

8.3 `paraboladelta` function

```
Rem This functions returns delta of a given parabola
Function paraboladelta(a As Double, b As Double, c As Double) As Double
    paraboladelta = b * b - 4 * a * c
End Function
```

Usage in Excel:

```
=paraboladelta(1; -3; 2)
```

8.4 `numberofroots` function

```
' This function returns
' -> 0, if delta < 0
' -> 1, if delta = 0
' -> 2, if delta > 0
Function numberofroots(a As Double, b As Double, c As Double) As Integer
    Dim delta As Double
    delta = b * b - 4 * a * c
    If delta < 0 Then
        numberofroots = 0
    ElseIf delta = 0 Then
        numberofroots = 1
    Else
        numberofroots = 2
    End If
End Function
```

Usage in Excel:

```
=numberofroots(1; -3; 2)
```

8.5 `findminimum` function

```
' This function returns the minimum of a given range
Function findminimum(r As Range) As Double
    mymin = 9999999
    For i = 1 To r.Count
        If r.Cells(i, 1) < mymin Then
            mymin = r.Cells(i, 1)
        End If
    Next
```

```
    findminimum = mymin
End Function
```

Usage in Excel:

```
=findminimum(A1:A10)
```

References

[1] Libreoffice documentation, help, and guides. `https://documentation.libreoffice.org/`, 2025. Accessed: 14 December 2025.

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