


# Introduction Excel

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# general

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Excel: **"spreadsheet-program"** (~OpenOffice 'Calc')

Software-versions:

- Excel 2003 / 2007 / 2010 / ...
  - advantage: more rows & columns
- Excel 2007 / 2010 / ...
  - new file-format & -extension: .xlsx (can still read .xls -files)
  - (! .xlsm if any macro is present/has to be saved in the file !)
- Language:
  - In this presentation: English
  - Translation to/from Dutch: "[Functies Excel NL-Eng-VBA.xls](#)" (*server/google*)
  - formulas are automatically translated at opening in other software-versions
    - Small exceptions: options in e.g. CELL("address";...)
    - English options work also in other language-versions of the software! (=>safe choice!)

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# general

## Examples:

["intro\\_Excel\\_MD20121011\\_v2\\_ENG.xlsm"](#)

*(see server)*



# formulas



# formulas

## Mathematics & statistics

- Direct: + - \* /
- Predefined functions
  - ABS
  - SUM
  - SUMPRODUCT
  - AVERAGE
  - COUNT
  - PERCENTILE
  - ...
- Suffixes:
  - "P": Statistics: !! sample ≠ populatie (p) !!
    - STDEV ≠ STDEVP
    - VAR ≠ VARP
  - "A": letters & 'logical values' are taken into account
    - COUNT ≠ COUNTA
    - STDEV ≠ STDEVA ; STDEVP ≠ STDEVPA
    - VAR ≠ VARA ; VARP ≠ VARPA

# formulas

## Logical functions & validation

- Logical functions:
  - AND
  - OR
  - NOT
  - IF
- Checks & conditions
  - > < >= <=
  - TRUE vs. FALSE
  - IS....
    - ISBLANK
    - ISERROR ≠ ISERR
    - ISINTEGER
    - ISNUMBER
    - ISEVEN vs. ISODD
    - ...

# formulas

## Convert values

- Rounding off
  - ROUND
  - ROUNDDOWN
  - ROUNDUP
- Date & time (*!!avoid rounding-errors!!*):
  - DAY
  - MONTH
  - YEAR
  - HOUR
  - MINUTE
  - SECOND
  - Formatting!!!:
    - Excel counts for dates/hours with 1=1day=24hours
    - Startdate changeable (usually standard: 1 = 01/01/1900 00:00:00)
    - dd/mm/yyyy uu:mm:ss (=>leading 0 )
- Use them back:
  - DATE
  - TIME

# formulas

## Find & refer to values & positions *in ranges*

- finding
  - Gives position of a certain value:
    - MATCH
      - Option: less than '1' <> exact match '0' <> greater than '-1'
  - Gives matching value in a certain range:
    - LOOKUP
      - Prefixes!
        - Horizontal <> Vertical
        - Option: approximate match 'TRUE' <> exact match '**FALSE**'
      - HLOOKUP
      - VLOOKUP
- referring:
  - Gives value at a certain position:
    - INDEX

# formulas

## Find & refer to values & positions *in values/txt*

### ➤ finding

- Gives position of a certain set of signs within a text/value:
  - **FIND** case-sensitive!
  - **SEARCH**

### ➤ referring:

- Gives set of signs (from left <> right or between certain positions):
  - **LEFT**
  - **RIGHT**
  - **MID**

# formulas

## Combine *txt*

### ➤ Combine

- **CONCATENATE**
- =...&...& "blabla" &...

# references



# references

## ➤ Fixing links (shortcut: 'F4')

- Fixed column    \$A1
- Fixed row        A\$1
- Both fixed      \$A\$1

## ➤ Retrieve cell information

- Full path:        CELL("filename"; ... )  
=> name of workbook & worksheet through MID+SEARCH [ ] /
- Cell:             CELL("address"; ... )
- Row:             CELL("row";...) / ROW(...)
- Column:         CELL("column";...) / COLUMN(...)

## ➤ Retrieve range information

- Number of rows:                    ROWS(...)
- Number of columns:                 COLUMNS(...)

## ➤ Convert number <> letters (see example workbook)

## ➤ Link indirectly (use the above)

- INDIRECT



# array-formulas



# array-formulas

## **Find & refer to values & positions *in values/txt***

- ❑ Apply formula-sets to whole ranges of values from 1 cell
  - advantages
    - Combine substeps in 1 single formula
      - véél minder kolommen & rijen, lichtere files
    - Multiple conditions & possibilities through combinations of `{=IF(...;IF(...;(IF...;...;...)))}`
  - disadvantage: complexity => test/validate your formulas
  - most (but not all) classic formula work with arrays! (except AND/OR/NOT)
- ❑ Method:
  - Use classic formula
  - Select range(s) instead of individual cell(s)
    - use ranges of the same sizes!!
  - **Ctrl + Shift + Enter** !!!!!!! (control: formula between { } )



# array-formulas

example:



# Shortcut Keys





# Shortcut Keys

## □ Move

- Window/program
  - ALT+TAB
- Workbook
  - Ctrl + TAB
- Worksheet
  - Ctrl + PageUp
  - Ctrl + PageDown
- Jump to end of empty/full ranges
  - End+ ←↓→↑

## □ Select

- Multiple selection
  - Ctrl + 'click'
- Range
  - Shift + 'click'
- Select onto end of empty/full ranges
  - Ctrl + Shift + ←↓→↑

# Shortcut Keys

## □ Calculate

- All worksheets:
  - F9
- Active sheet
  - Shift + F9
- Select onto end of empty/full ranges
  - Ctrl + Shift + ←↓→↑

## □ Help / interrupt

- help
  - F1
  - ...Google
- interrupt
  - Esc

# Import data



# Import data

## □ Formats

- .xls => .xlsx (Excel 2007/2010/...)
- incl. macro's: .xlsm
- others: .csv , .txt

## □ Import data

- Open
  - > Open (Ctrl + O)
  - Copy-paste
  - 'Slide' file on Excel-window!
- Orden:
  - In Excel: Data > Text to Columns > Delimited/Fixed width

## □ Separators (decimal / thousands / delimiters)

- Settings:
  - pc: language settings
  - Excel-options
- 'tricks':
  - ...in e.g. Word, Notepad++ , ...: Find/Replace
  - ...in Excel if text: [FIND/LEFT/RIGHT/MID](#)



# Charts



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# Charts

## ☐ readability

- Colours: contrasts!! (hatch ?)
- Line-types & -width
- => use systematic logics (e.g. blue/thick=outside, full line=temperature, dotted=RH)

## ☐ informative

- Add (brief!) legends, titles, units !!!
- Use the most informative units/values
  - average <> median <> boxplot
  - absolute <> relative values

## ☐ structure

- Possible use of 2 Y-axis!!
- Possible grouping of X-axis-value

!!! Add your own, thorough but concise interpretation in your text, especially of what doesn't seem directly logic !!!

Extra tip: blank or error cells that shouldn't appear: use =na()



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# TIPS



# TIPS

## How to handle large files

### Calculation

- Excel Options > Formulas > Manual > Recalculate workbook before saving
- F9 / Shift-F9
- Don't forget to switch back when possible/needed

### Format

- .xlsx (since Excel 2007)
  - is smaller/compressed <> .xls
  - (but needs conversion to be read by older versions of Excel)

### Use array formulas

- not always super-fast formulas, but much(!) smaller and more readable files



# TIPS

## Find your own errors

- Test files & formulas (e.g. On small simple data)
- Add error tracers
- Conditional formatting:
  - Home Tab > Conditional Formatting > Manage Rules
  - Define sets of rule (e.g. > < = , but also complex formulas) to automatically format a cell (its colour, text-formatting etc.)
- Compare results

# TIPS

## Keep it structured

- Exceptions
  - Prevent them...
  - Highlight them (e.g. error tracers)
- Use **links** !!!!
  - Easier to update/correct
  - Easier to copy-paste to other input-data
  - Prevents errors
- Use **codes** & conversion tables!!
  - Working codes <> public codes <> internal codes
    - Simple <> informative <> referential
    - e.g. W1 <> W1\_HO\_HB\_B <> adres/naam/...

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