Basic Operations

► Creating a **workbook**:
  • The first action should always be to give your workbook a name
    and save it on your computer.
    Go for this to the menu bar and select by left mouse click (LC):
    $\rightarrow$ File $\rightarrow$ Save As
    $\rightarrow$ In the window which then opens enter a file name:

| File _n_ame:	FirstWorkbook	▾	🖫 _S_ave
Save as _t_ype:	Microsoft Excel Workbook	▾	Cancel

    $\rightarrow$ Save as "Microsoft Excel Workbook"
  • Excel files have the extension "xls" on the disk, e.g. the above
    example will be stored (saved) as "Firstworkbook.xls".
  • Organize your Excel files (in fact like all other ones) in folders.
  • While editing save your file once in a while just by LC
    on save 🖫 , this way you do not loose data in a crash.   **11**

► Entering data onto a **worksheet**:
 • Data can be entered onto the worksheet either by typing into the
   active cell or by typing into the formula bar.
 • Cell entries may be completed in various ways, e.g. complete C8.
   a) Enter $\rightarrow$ moves to the next cell in the same column, e.g. C9.
   b) Shift+Enter $\rightarrow$ moves to previous cell in the column, e.g. C7.
   c) Cursors ←,→ ↑,↓ $\rightarrow$ move to the cell in the direction indicated,
                e.g. B8, D8, C6, C9.
   d) Enter button ✓ $\rightarrow$ completes but does not move to a new cell.

 | ✕ ✓ = | City |
   |---|---|
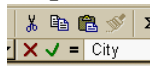
   e) Esc $\rightarrow$ does not move and cancels all modification done
            after the last completion of the type a), b), c) or d).
   f) Cancel button ✕ $\rightarrow$ has the same effect as e).(Edit →Undo, ↺)
   💣 Do not finish the entry by clicking with the pointer onto   **12**
   a new cell as this will produce wrong results for formulae.

► Modifying entered data:
 • Use "delete" or "backspace" (⟵) to delete right or left from the
   insertion point, respectively.
 • LC on a cell (or formula bar) with some old entry and overtype it.
 • Edit → Clear → All (deletes all informations related to the cell)
                  → Contents (deletes only the content of the cell)
 • Use the spelling tool to correct mistakes: Tools → Spelling
      Expl.: Assume a cell has the entry "Citi", Tools → Spelling →
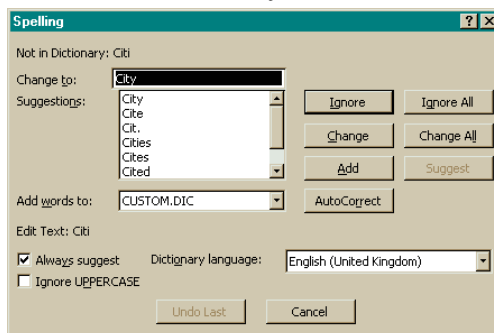
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► Formatting the cell entries:
 • For presentational reasons one can change the format in which
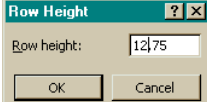   the cell entries are displayed: Format → Cells →
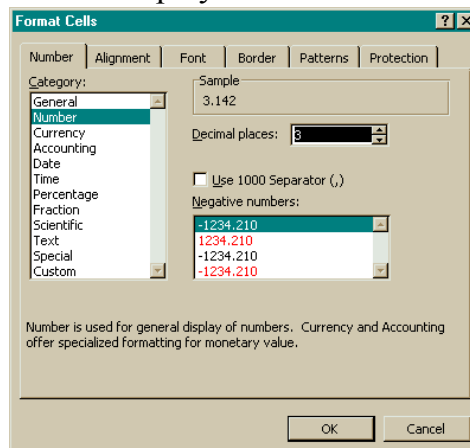
 - One can change the category (type of data) and its associated
   properties.

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- Alignment allows to change the horizontal or vertical position and the orientation of the text.
- Font gives options to change the typeface and the colour of the displayed entry.
- Border provides possibilities to change the style of the frame surrounding a cell.
- Pattern changes the background of the cell.
- Protection allows to protect cells from being changed.
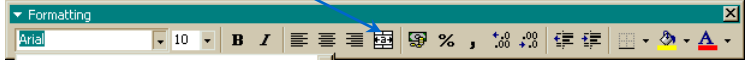
► Formatting the cell size:
- Position the pointer on the dividing line between the name of the row/column (e.g. 5|6 / E|F) and drag the line to the desired size.
- Alternatively use the menu bar:

    Format → Row → Height   or Format → Column → Width
    and change the numerical value, e.g.

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► Merging cells:
- One can merge a range of cells into one single cell. This is useful for instance for large titles. To do this select the range and then LC on the "Merge and Center" button in the formatting toolbar

► Adding comments to a cell:
- Sometimes it is useful to add some additional information to a cell which should not be visible on the WS for some reason. This is done by: Insert → Comment → a window open into which one can type a comment.
- A cell which has a comment attached to it is marked in the top right corner by a red triangle.
- The comment is made visible by pointing on top of the cell.
- The comment is removed by Edit → Clear → Comments.

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► The Autofill function:

• The Autofill function determines automatically the entries of some cells given some starting values. Avoids lots of typing!

· Expl.: Fill the column C1-C20 with 50-1000 with step 50, i.e.
$50 \to C1, 100 \to C2, 150 \to C3, ... 1000 \to C20$

- fill in some starting values: $50 \to C1, 100 \to C2$
- select the range of the starting values C1:C2
- while on top of the selected area the cursor will be ✚
- move the cursor to the lower right corner of the selection, until the cursor changes from ✚ to ✚
- drag the "fill handle" down (or to the right) and the new cells will be filled based on the initial selection, e.g. $150 \to C3,...$
- verify that Excel really filled in the sequence you wanted!!!

· Alternatively write just 50 into C1. Use Edit → Fill → Series with "Step value"=50, "Stop value"=1000
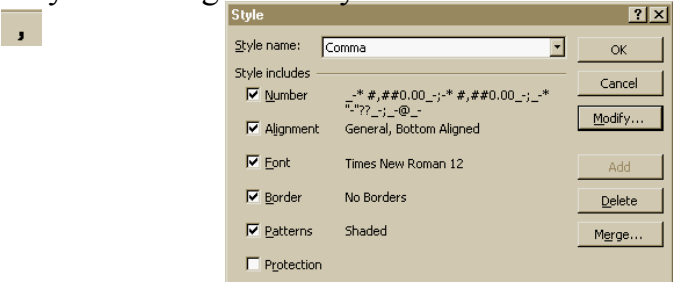
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► Different types of data:

• **text** is left adjusted by default, use the format toolbar to change the adjustment, text format, indent or colour (find out yourself)

• **numbers** are right adjusted by default, use the format toolbar to change the format as for text

- in/decrease decimal → in/decreases the number of decimal

  points *displayed*, but not the cell value, e.g. $3.141 \to 3.1415/3.14$

- comma style → changes to a style defined in: Format → Style

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- percentage style **%** → changes to a style pre-defined in the
  "percentage" style (similarly as above)
- currency style → changes to a style pre-defined in the
  "currency" style (similarly as above).
  It adds a currency sign such as $, £, €,...
• **<u>formulae</u>** are expressions which tell Excel to perform operations
  - All formulae begin with an "="-sign followed by some
    arithmetic expression.
  - The expression may contain numeric values, cell references and
    arithmetic operators. It is important to note the difference
    between the formula inside a cell and the numerical value
    displayed on the WS. With Ctrl+` you can change the display.
  - Expl.: In the cell C5 write "=A1 +A2+A3". This will add the
    three cells A1, A2 and A3 and displays the result in C5.
    When you alter A1-A3 C5 will change accordingly.   **19**
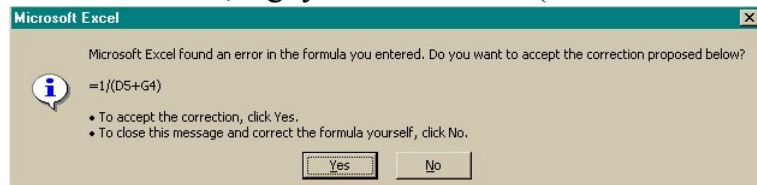
- In Excel and other major programming languages expressions
  are evaluated following a specific order of precedence for the
  arithmetic operators.
- The order is:
  · negation: "-"
  · exponentiation: "^"
  · multiplication and division: "*", "/"
  · addition and subtraction: "+", "-"
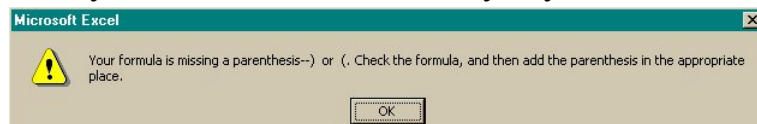- The order of precedence can be overwritten by parentheses.

  Expl.: $-4\wedge2 \to 16$
          $-(4\wedge2) \to -16$
        $3*(5+6) \to 33$
          $3*5+6 \to 21$
        $3\wedge2+7 \to 16$
        $3\wedge(2+7) \to 19683$ **20**

- Formulae can be entered by means of pointing, that means instead of typing the cell reference one can simply LC on the appropriate cell.
- Expl.: Enter the formula =1/(D5+G4) into B4

  → type "=1/(" into B4 → LC on D5 → type "+"

  → LC on G4 → type ")" → complete the entry

· in case you entered a formula incorrectly Excel offers a corrected version, e.g. you entered "=1/(D5+G4"→

Microsoft Excel	☒
ⓘ Microsoft Excel found an error in the formula you entered. Do you want to accept the correction proposed below?	
=1/(D5+G4)	
• To accept the correction, click Yes.	
• To close this message and correct the formula yourself, click No.	
[Yes] [No]	

· in case you select "No " Excel tells you your mistake

Microsoft Excel	☒
⚠ Your formula is missing a parenthesis--) or (. Check the formula, and then add the parenthesis in the appropriate place.	
[OK]	

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► Relative, Absolute and Mixed Cell References

• There are several default assumptions made by Excel when you enter a cell reference:

a) Excel assumes the cell is on the same WS and in the same WB as the cell in which you enter the formula.

b) Excel assumes the reference is a relative reference, that means the cell reference changes when you copy the cell.

  - You copy a cell or a range by selecting the range or the cell

    Edit → Copy → select the destination cell(s) → Edit → Paste

• A column or a row can be "fixed" by adding a "$"-symbol: There are four possibilities:

  = A1   ≡   changeable column and row (relative reference)

  = A$1   ≡   changeable column, fixed row (mixed reference)

  = $A1   ≡   fixed column, changeable row (mixed reference)

  = $A$1 ≡   fixed column and row (absolute reference)   22

• Examples:

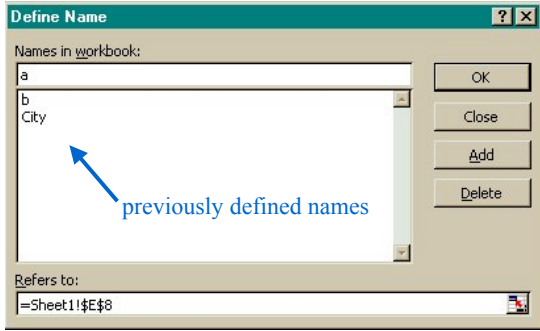| copy cell reference	paste cell reference	relative difference	formula being copied	final formula pasted cell
C5	D6	add one column add one row	=F4 =$F$4 =$F4	=G5 =$F$4 =$F5
C5	D3	add one column subtract 2 rows	=K7*B$7 =A3+$B7	=L5*C$7 =B1+$B5
C5	F11	add 3 columns add 6 rows	f(A1:B5) f(A$3:A7)	f(D7:E11) f(D$3:D13)
C5	F1	add 3 columns subtract 4 rows	=A3 =Z5	=#REF! =AC1

- f(...) indicates some function see below
=#REF! is an error message ≡ cell reference not valid   23

► Naming cells or ranges:
 • You can attach a name of your choice to a cell or a range and
   then use it as variable in a formula instead of a lengthy references
   Menu bar: Insert → Name → Define →

-The name will also
  appear in the reference
  area. You can also type
  there directly to give a
  name to the cell.

  previously defined names

  Expl.: · cell A1 is called "b" and cell E8 is called "a"
          =(A1+E8)^2   ≡   =(a+b)^2
         · the range B2:H8 is called "City"
          =f(B2:H8)   ≡   =f(City)   24