

Ch 13: spreadsheets

- software that allows storing & manipulating data in an array of cells, like in a table

→ The user designs the table by filling empty cells with

- labels (text)
- numerical values → date / time
↓ numbers
- formulae (calculations)

--- • by changing the appearance of data (format)

--- • by adding graphics:

- borders
- plots / charts from data.

- Examples of spreadsheet usage

→ storing bank statements received online
(search transactions, check balances, etc)

→ keeping track of business expenses

→ storing results of lab experiments + plotting data

→ calendar

→ database of books + location in bookstore

One cell = one datum. Every datum - has a type

• Data types when entering data

→ typing digits = data is considered #

→ typing a letter = data is considered text (label)

→ typing a date (digits / digits / digits) = data considered date

Type of data is important. Spreadsheets display data based on type

(5)

001234 → shown "1234" if numerical

→ shown "001234" if text

↳ if it represents a product ID in our table, don't lose the '0'-s!

How to always interpret a string of characters (eg "001234") as text: prefix the text with apostrophe ' '.

(6) Enter student# as '001234', etc...

• Format of data → the way it is displayed on screen.

- precision of numbers (# of fractional digits)
- currency sign displayed or not
- negative # shown red ...

OBS

Dates & times are stored as numbers
→ allows to calculate # of days between
two dates : "8-aug-07" - "3-aug-07" = 5
→ dates / times are number formats.

Data formats → controlled by "Format cells"
menu (pop-up window after rightclick on cell).

Formulae & functions

→ formulae & functions must be preceded by "="

(ex) $=12^2$ ($12^2 = 144$, etc).

result of evaluation is displayed.

- recall the precedence of operators
((), exponent, *, /, +, -)

- formulae & fct contain references to cells
by column name (A, B, ..., AA, AB, ...)
and row number

(ex)

| | A | B |
|---|----|----|
| 1 | 25 | 13 |

$=A1+B1$

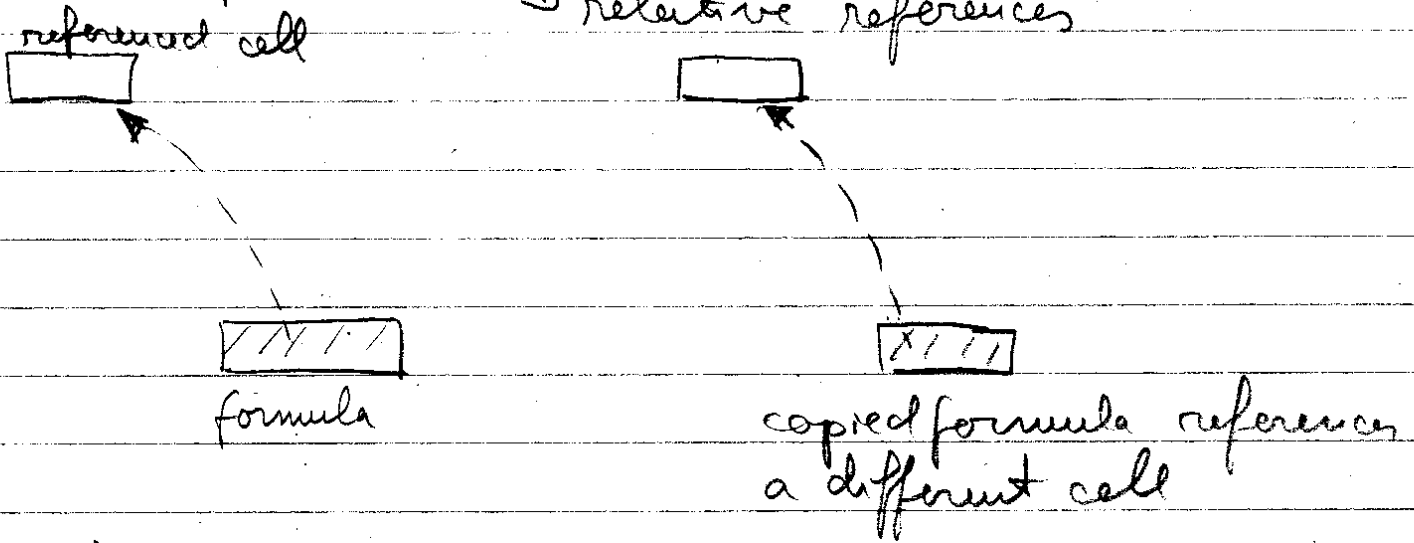
will display 38

- as data in referenced cells changes, the result of evaluation also changes.
- referenced cells can themselves be formulae.

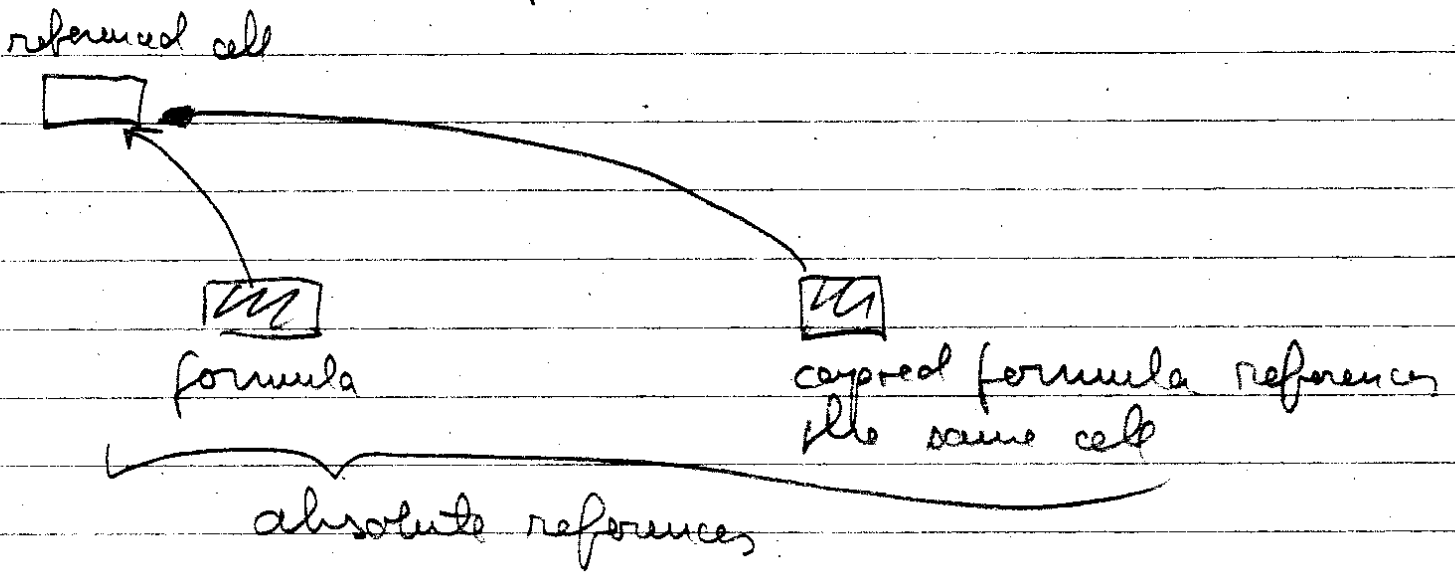
Automation in creating tables:

→ copy / paste operations.

→ formulae → absolute references
 → relative references



relative references



absolute references

Week 4 Day 1

Recap

- Spreadsheets = grid of cells (worksheet)

- cell addresses (row & column label)

number letter

- cell data types

- text
- number
- formulae

Data format (appearance)

assigned to the cell

font (italic, bold...)

nic font

alignment in cell

precision (# decimal digits)

currency

date / time

} text

} #

Graphic elements - borders (help visualize information)

plots, charts (- - -)

A user designs a spreadsheet application by

adding - data -> cells

controlling format

graphics

How to create a spreadsheet application

① Decide what kind of information should be stored & displayed, & how it will be used

eg - info about books that I want to purchase under limited budget, decide which books to buy.

- analyze data

a) how many types of records?

Record = all data about 1 item (book, store)

b) For each type of record, what are the fields of data?

Field = atomic (indivisible) piece of info about a record.

ex: title, price, author, ISBN, editor, year (book record)

: name, phone#, address, google maps link (store)

Consider what is important for the application when deciding fields.

ex For case i) Title, price_storeA, price_storeB...

for book fields

Shipping charge, store name

for store fields

For case ii) - title, author, price, purchase date, Notes (where is the receipt)

-c) source of data → typing
 ↘ calculated (formula)
 ↘ external data (text file...)

External data

→ text file with records on separate lines
 fields separated by comma
 ; semicolon
 TAB etc.

ex: reporting bank transactions as
 "text file (comma delimited)" (pc/financial.ca)

Excel: Data / Get external data / import text file
 (records & fields are entered in cells)

→ placement of records / fields across cells
 should accommodate external data report

② Place the information on worksheet (initial design)

usually fields → columns
 records → rows

| | A | B | C | D | |
|---|-------------|------------|-------|-------|-----------|
| 1 | Title | Author | Price | Notes | ← header |
| 2 | To Kill ... | Harper Lee | 20 | --- | ← records |
| 3 | | | | | ↙ |

- use labels to identify the fields (header)
- consider highlighting important portions of worksheet

eg: header

- thick font
- background color
- borders

Do not overdo!

③ Change the design

a) Inserting columns (to add a new field for example)

| A | B | C |
|-------|-------|---|
| Title | Price | |
| ~ | ~ | |

author missing,
add between title & price

| A | B | C |
|-------|---|-------|
| Title | | Price |
| ~ | | ~ |

↑
enter new field

1) click label of column where new field must be inserted (B)

2) Right click B

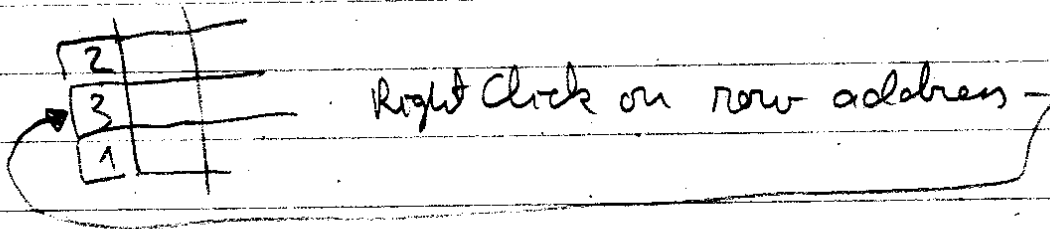
3) Choose "insert" in the pop-up menu.

All fields right of newly inserted column have new column addresses.

All references to "Price" in old column B are automatically changed to new column C.

Note - inserting a column does not create a new column with a new address like C' or C-bis. It moves data \rightarrow right to make room for new field.

b) Inserting rows - number



c) Deleting row/column: rightclicks on row/col address, choose "delete" in pop-up menu.

d) Hide / unhide rows/cols
 \rightarrow collapses row/col to zero width (not visible)
 \rightarrow can still be referenced in formulas

e) Sorting: change the order of records / fields.

| Title | Author | Price |
|-------|--------|-------|
| T1 | A1 | 10 |
| T2 | A2 | 15 |
| | | |
| | | |

1) select the records to be sorted (incl. all fields!)

2) Data / Sort menu

3) Choose column to be used for sorting

Options \rightarrow can specify to sort by rows (eg records = column headers = rows)