



Human-Computer Interaction 2024/2025

Lecture 7

Interaction styles

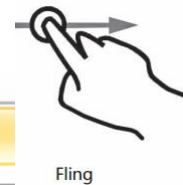
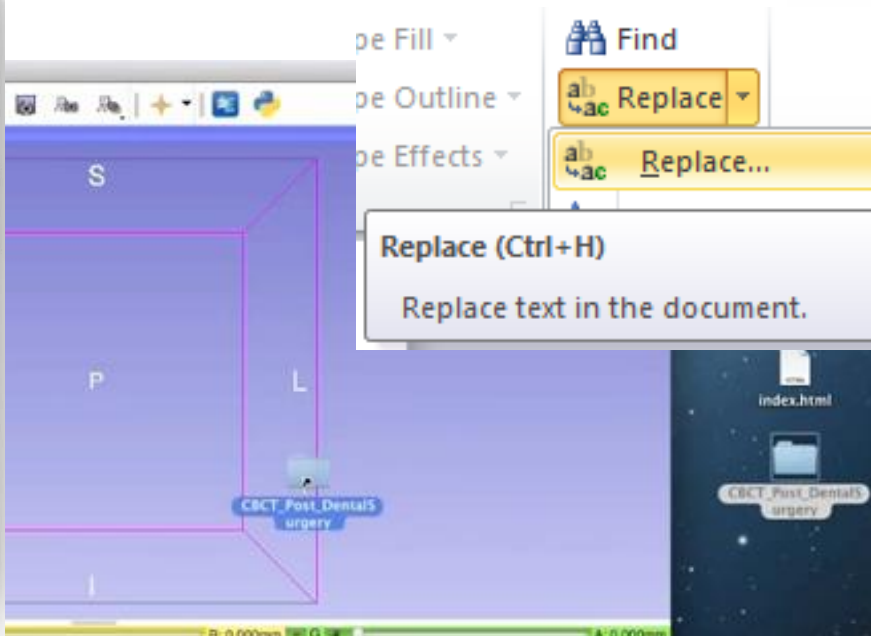


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e informática

Interaction styles



Interaction Styles

“The concept of Interaction Styles refers to all the ways the user can communicate or otherwise interact with the computer system.”

Soegaard, Mads. Interaction Styles (Retrieved March 2025)
[Interaction Styles | The Glossary of Human Computer Interaction](#)

There are a lot of studies and design guidelines

Shneiderman's Eight Golden Rules of Dialogue Design

1. Strive for consistency
2. Enable frequent users to use shortcuts
3. Offer informative feedback
4. Design dialogues to yield closure
5. Offer simple error handling
6. Permit easy reversal of actions
7. Support internal locus of control
8. Reduce short-term memory load

These golden rules are paramount in the UI design process

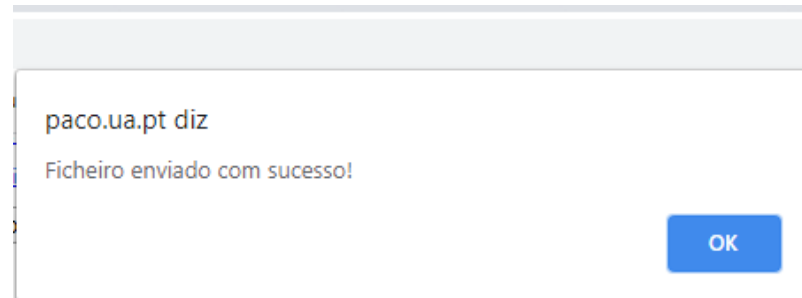
[Shneiderman's Eight Golden Rules Will Help You Design Better Interfaces | IxDF](#)

Support internal locus of control

- Allow users to be the initiators of actions
- Give users the sense that they are in control of events

Design dialogue to yield closure

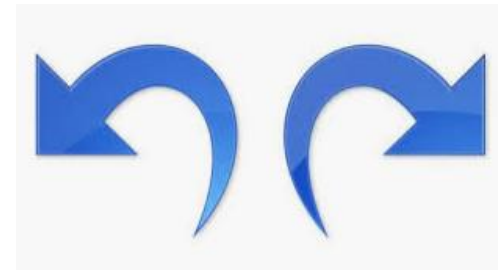
- Don't keep users guessing.
- Tell them what their action has led them to



Allow easy reversal of actions

encouraging exploration of unfamiliar options

undo – CTRL z



Allow frequent users to use shortcuts

Common examples:

save – CTRL s

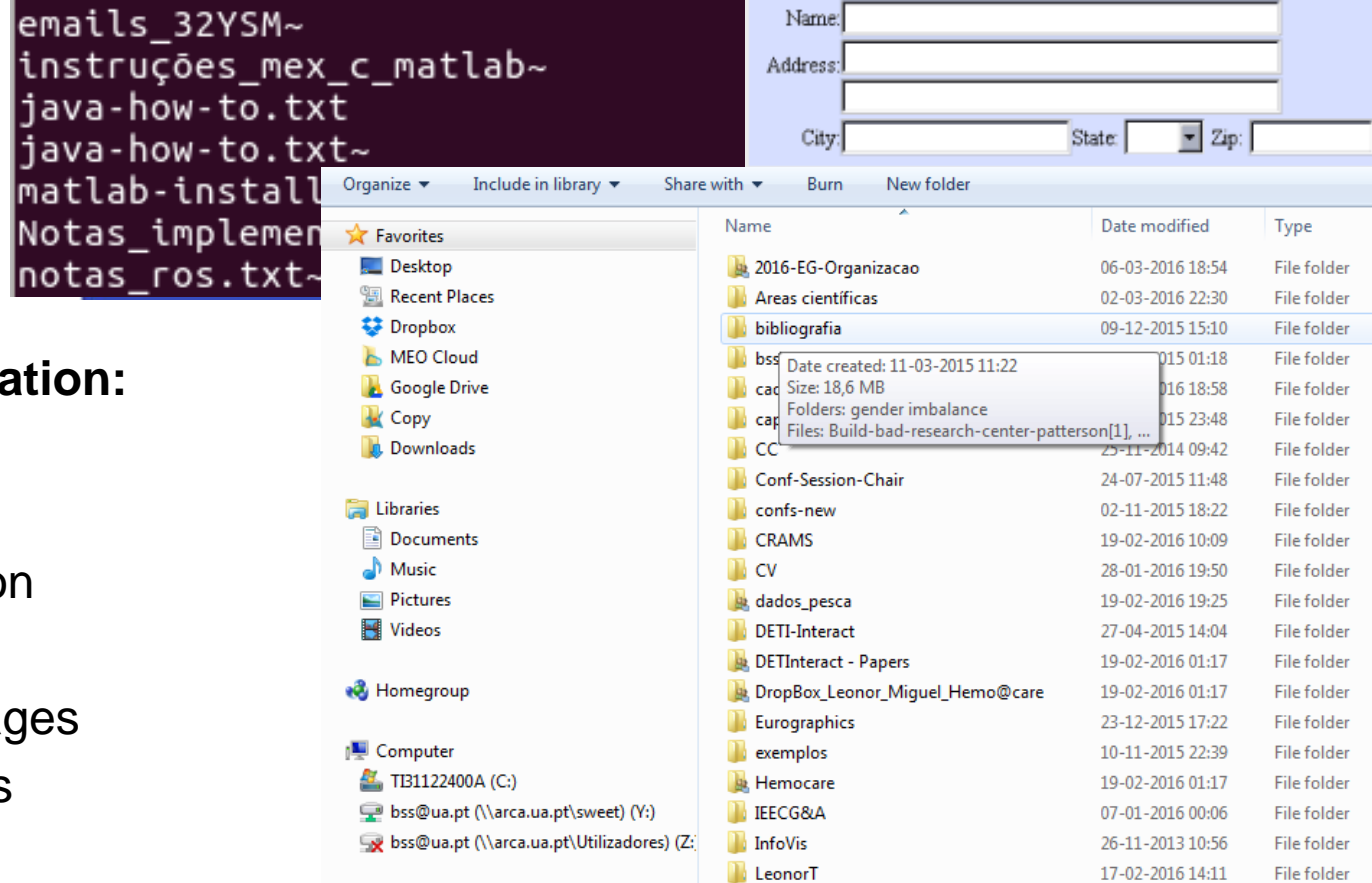
copy – CTRL c



Interaction styles

A possible classification:

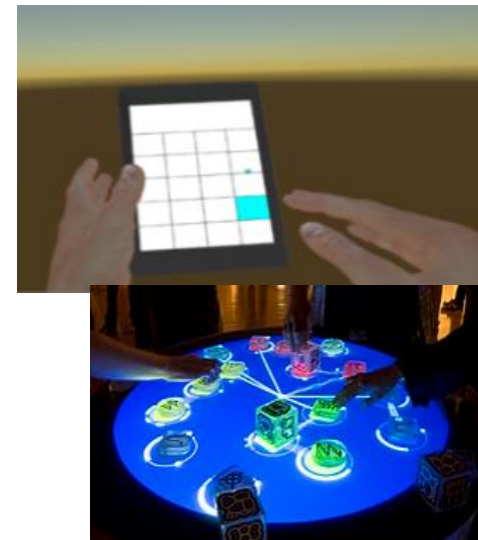
- Menus
- Fill-in-forms
- Direct manipulation
- Function keys
- Command languages
- Natural languages
- ...



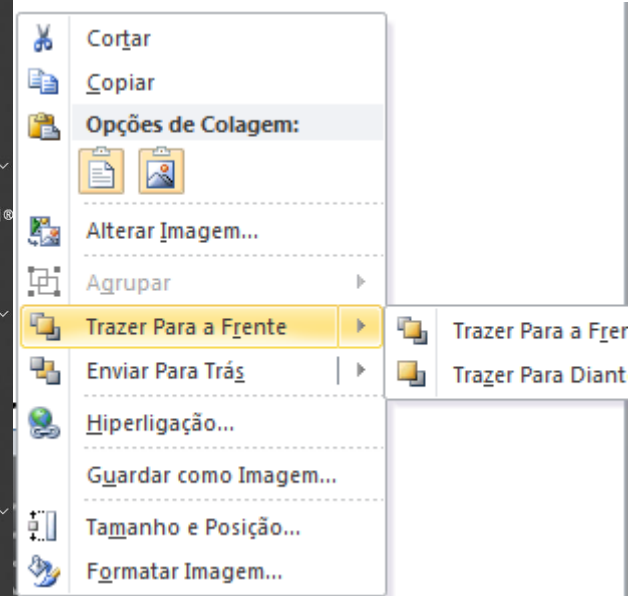
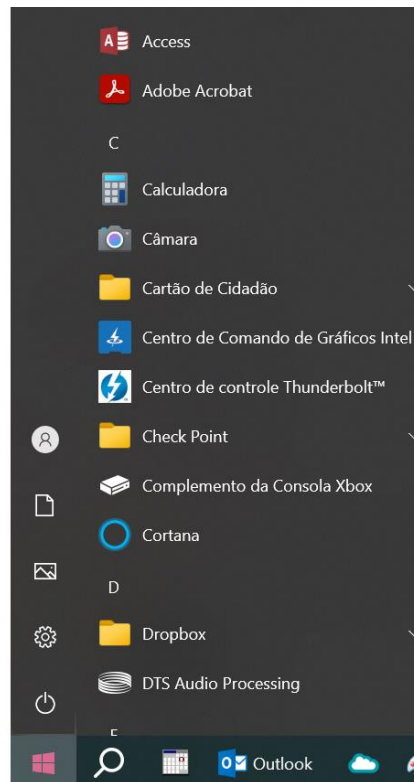
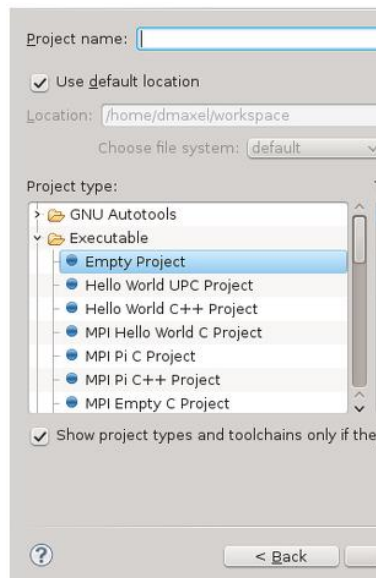
Often two or more styles are used simultaneously

Less traditional user interfaces (UIs):

- 3D user interfaces
- Conversational user interfaces
- Tangible user interfaces
- etc....



Menus





- The concept existed long before computers
- Selection of options
- There are several types

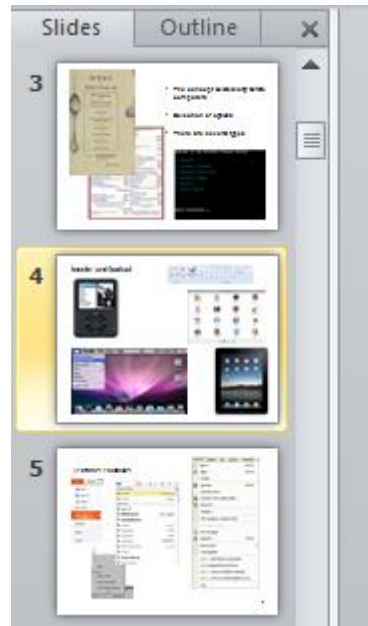
PASTA DISHES	
choice of Spaghetti, Linguine, Capellini or Ziti	
li, Garlic & Oil	\$8.95
li or Sausage	\$8.95
Sauce	\$7.95
ra Sauce or Fra Diavolo (Spicy)	\$8.50
Above served with a tossed salad	
AMERICAN ENTREES	
Baked Homestyle Lasagna	\$8.95
Baked Ziti or Baked Ravioli (Cheese or Meat)	\$8.25
Baked Manicotti	\$8.95
Baked Stuffed Shells	\$8.95
Baked Stuffed Shells Florentine	\$9.50
Above served with a tossed salad	
GRINDERS	
(Toasting)	
Chicken Parmigiana	\$7.25
Meatball or Sausage Parmigiana	\$6.95
Vent Cutlet Parmigiana	\$7.95
Eggplant Parmigiana	\$6.95
Above served hot with tomato sauce & mozzarella cheese	
Extras on grinders: Cheese + \$1.00, Bacon or Ham + \$1.00, Mushrooms + \$1.00, Peppers or onions + .75	
CALZONES	
Plain (Stuffed with Ricotta & Mozzarella Cheese)	\$8.95
Extra Item	\$2.00
Toppings: Bacon, Broccoli, Eggplant, Garlic, Olives, Onions, Green Peppers, Meatball, Ham, Sausage, Salami, Sweet Meat, Peppermint, Mushrooms, Spinach, Tomatoes	

Welcome to the Viridian Finance System

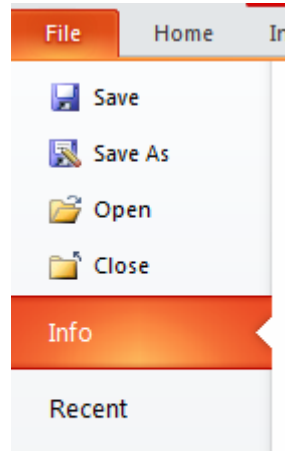
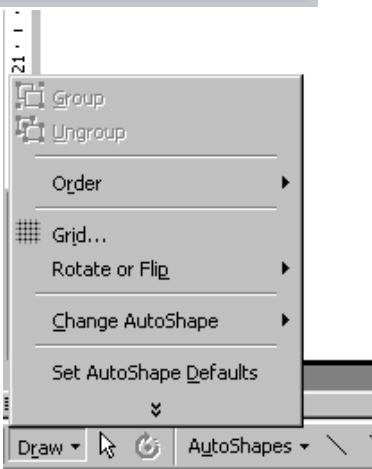
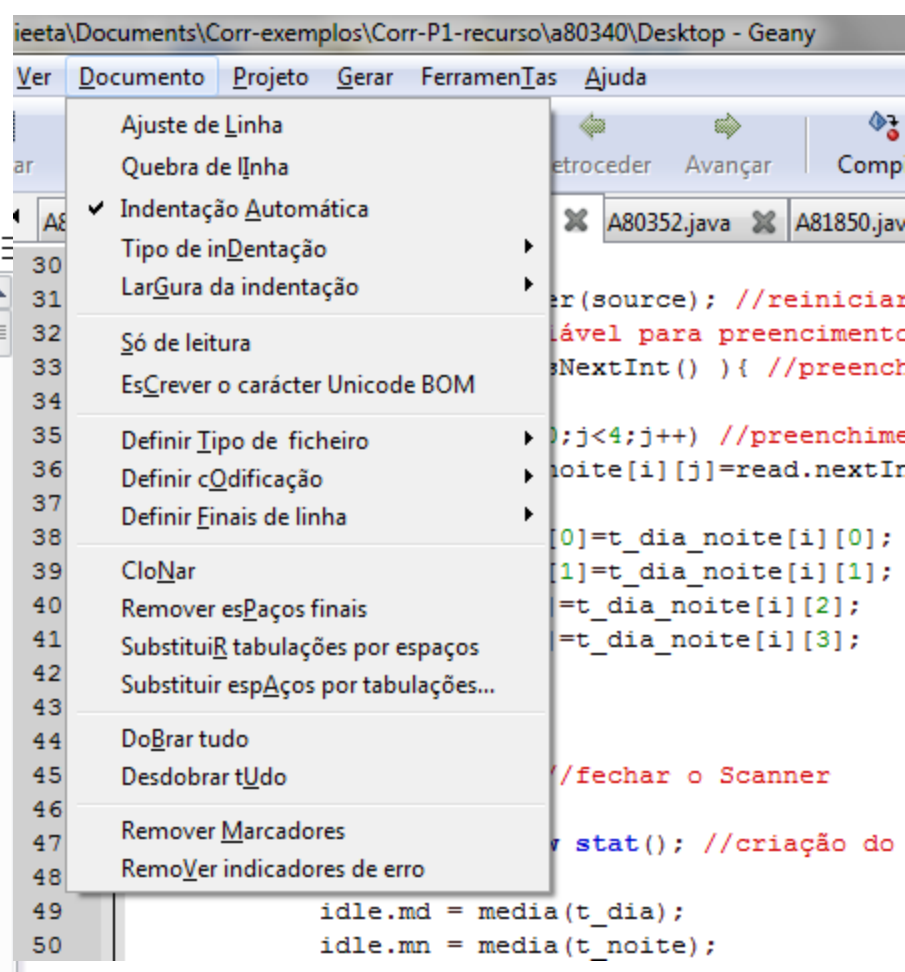
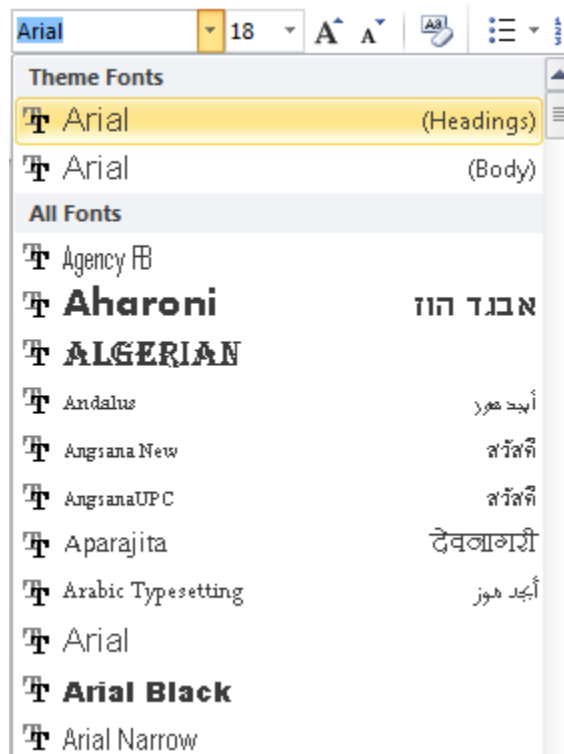
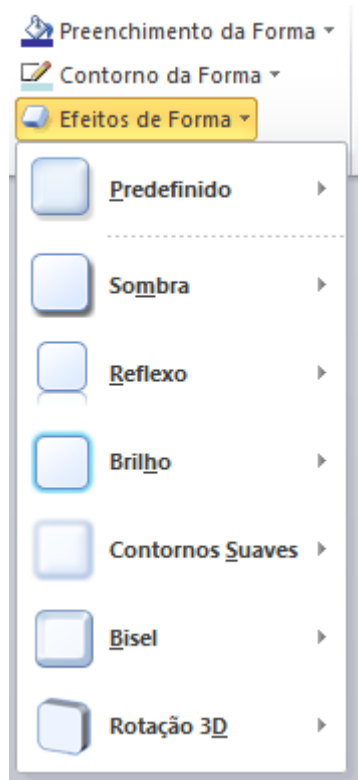
1. Payroll
2. Accounts Payable
3. Accounts Receivable
4. General Ledger
5. Reports
6. Write Checks

Enter Selection: _

Iconic

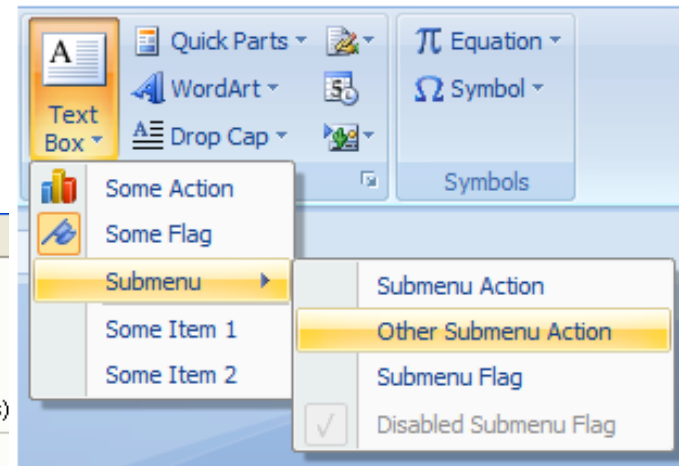
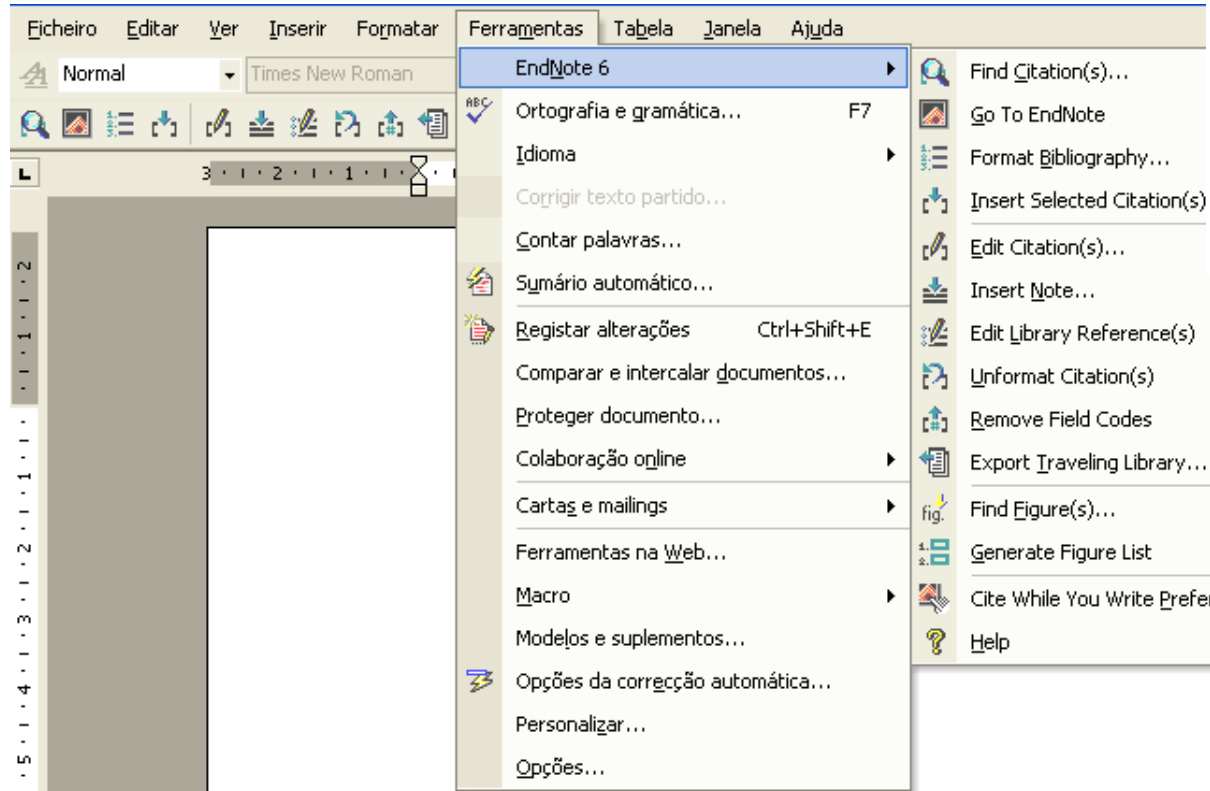


Textual



Pull-down/ pull-up menus

Cascading menus



Main Heading

Menu 1

Menu 2

Menu 3

Item 1

Item 2 ...

Item 3

Item 4

Subitem 1

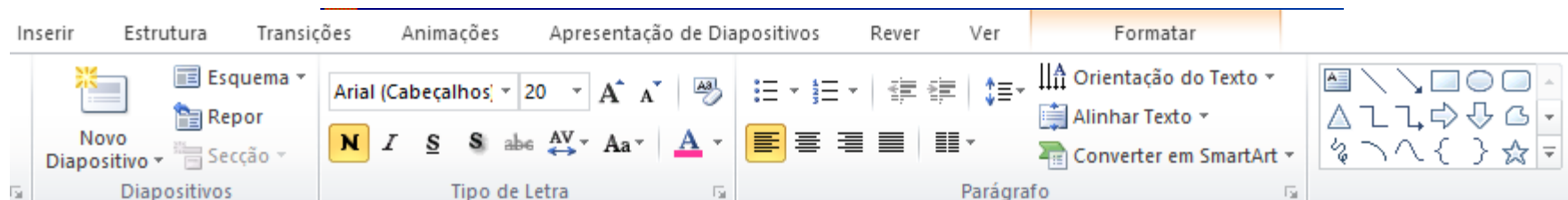
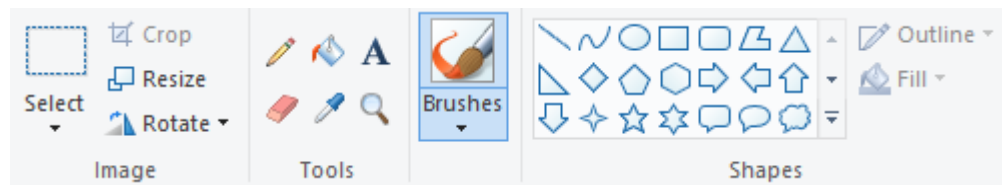
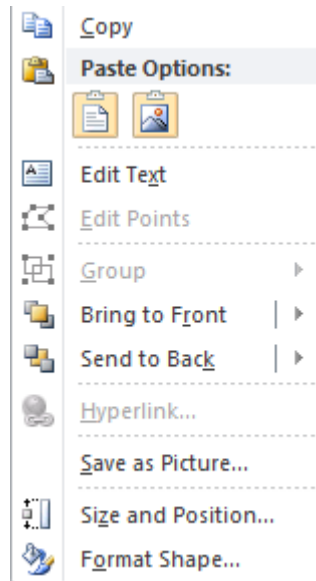
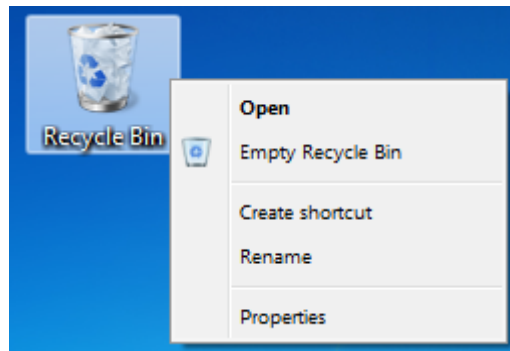
Subitem 2

Subitem 3

Subitem 4

Subitem 5

Always visible / Pop-ups



Menus: main advantages and disadvantages

Advantages (potential, i.e. **if properly designed**)

- Auto-explanatory
- Do not load memory (recognition rather than recall)
- Prevent syntactic errors
- Visible improvements

Disadvantages

- Not efficient
- Not flexible
- Not practical for many options

User profile to whom menus are adequate:

Knowledge and experience:

- Low system and task experience
- Frequent usage of other systems
- Low computational literacy

Work and task:

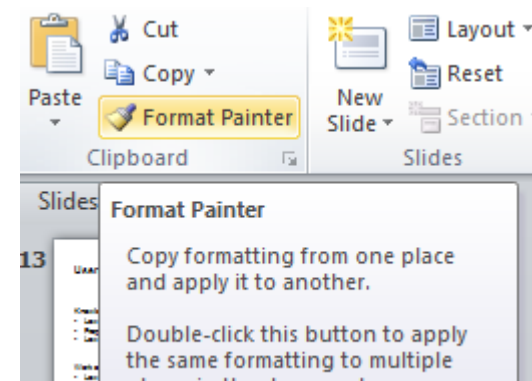
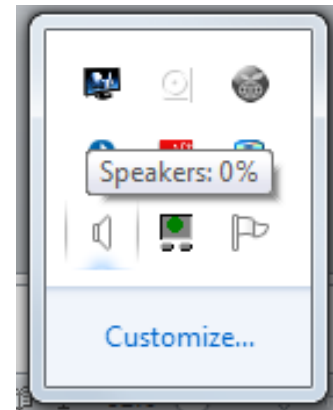
- Low frequency of use
- No training
- Optional usage
- Highly structured tasks

Menu design: relevant aspects

- Menu structure
- Option ordering
- Option selection
- Menu invocation
- Navigation

Menu design: guidelines

- Adequate the menu structure to the task structure
- Minimize depth increasing breadth (within reasonable limits)
- Use an adequate ordering method
- Be coherent (design, option names, etc.)
- Give selection feedback to the user
- Include tooltips if names or icons are not auto-explanatory
- Indicate currently unavailable options
- ...
- Etc. etc.



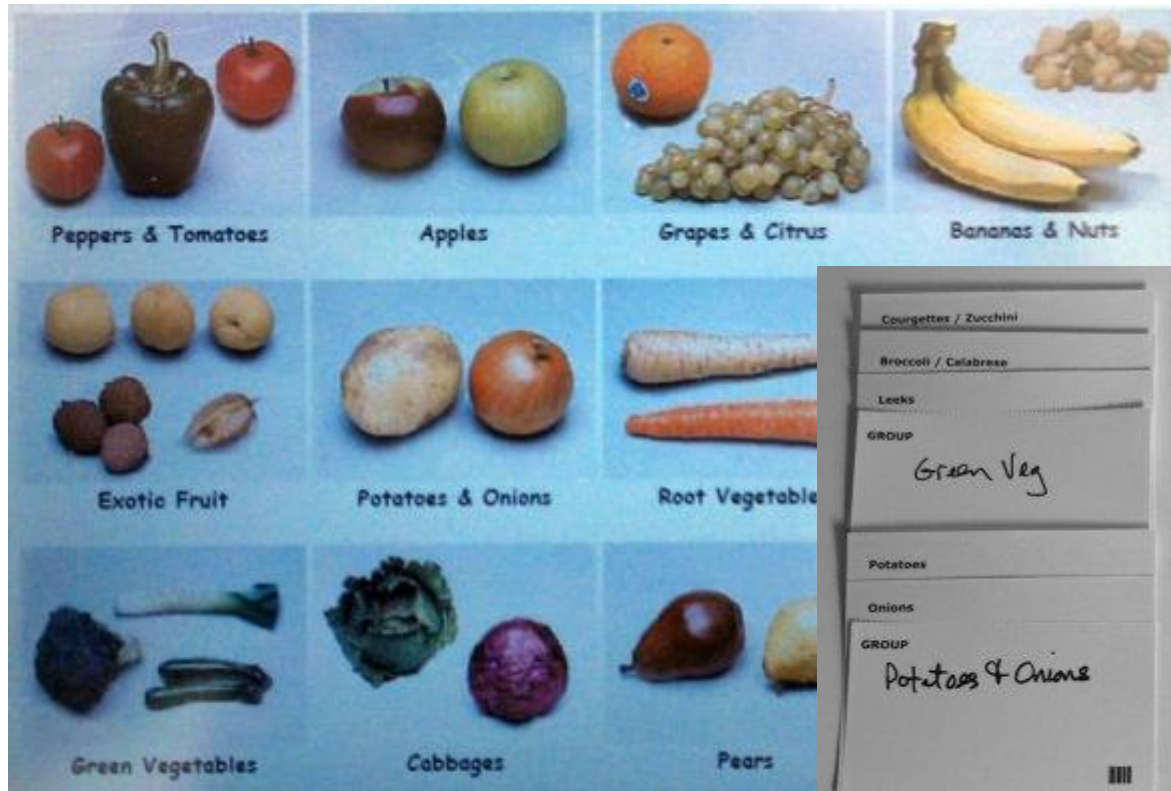
Menu design: guidelines

- Find the adequate structure using card sorting:
a low-cost method that helps understanding how users expect to find functionality, and build structures aligning with their **mental models**



- Card sorting (usually performed by potential users of an interactive solution) provides information on:
 - Terminology (what people call things)
 - Relationships (proximity, similarity)
 - Categories (groups and their names)
- that can be used to decide upon:
 - which items should be grouped together in displays
 - how menu contents should be organized and labeled
 - what words should be employed to describe the objects of our users' attention

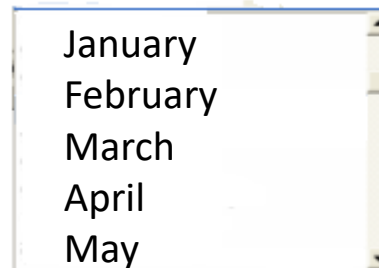
Card sorting example: think about how to sort the fruits and vegetables sold in a supermarket (may be it is not as easy as it seems...)



[Card Sorting | The Encyclopedia of Human-Computer Interaction, 2nd Ed.](#)

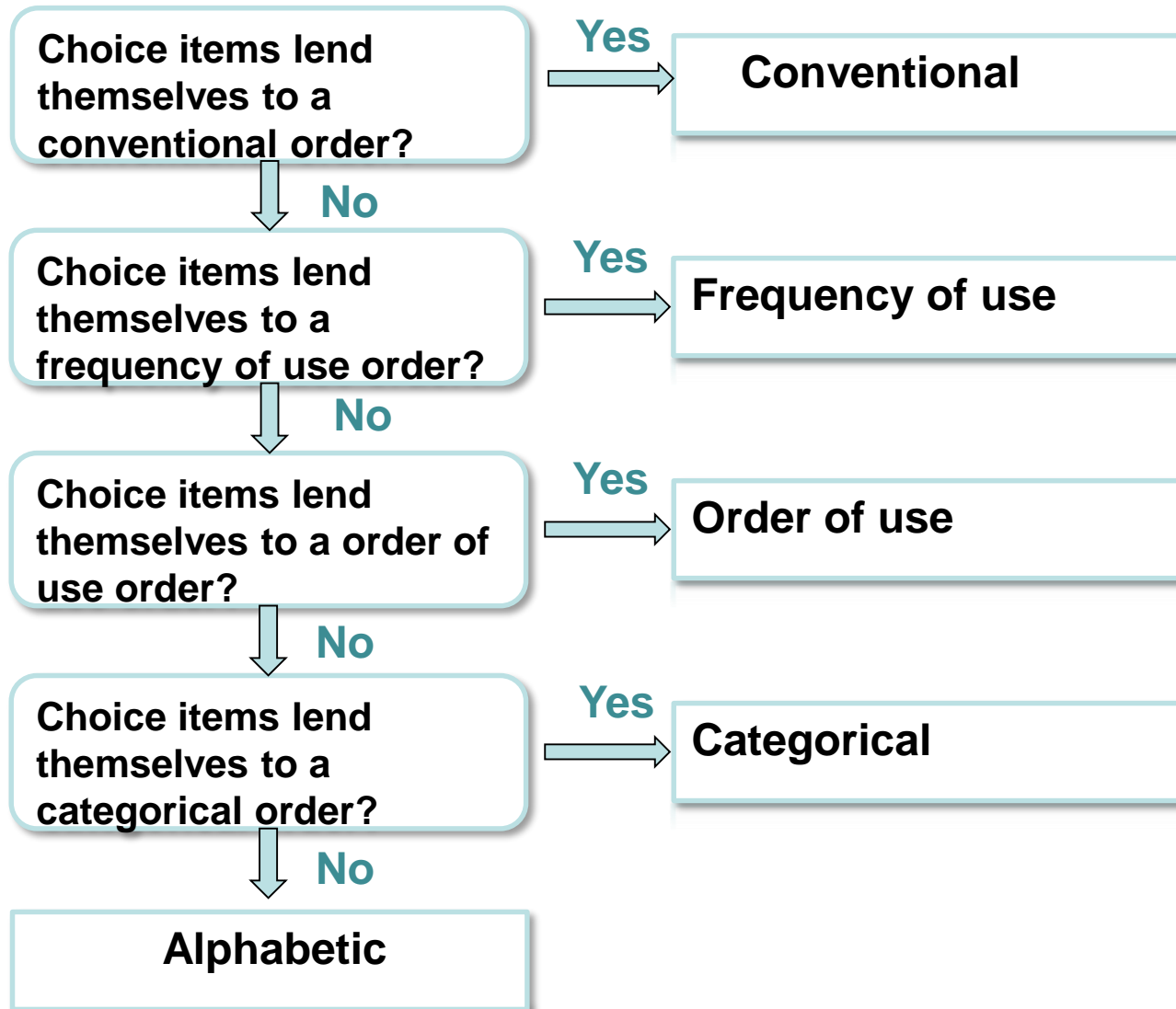
Select adequate option ordering

Which ordering scheme would you select?



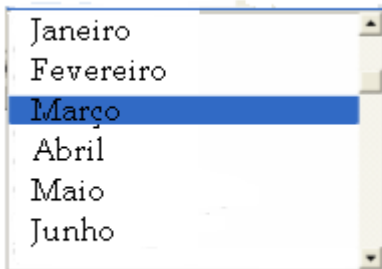
Why?

Select adequate option ordering

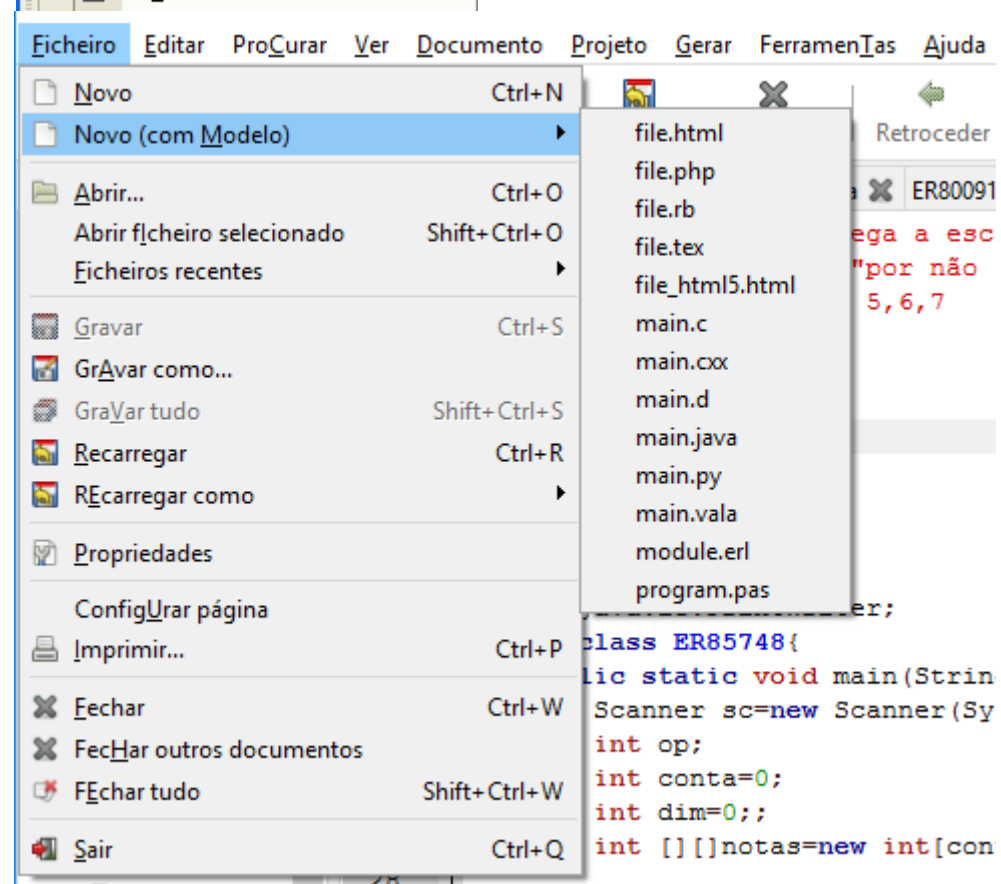
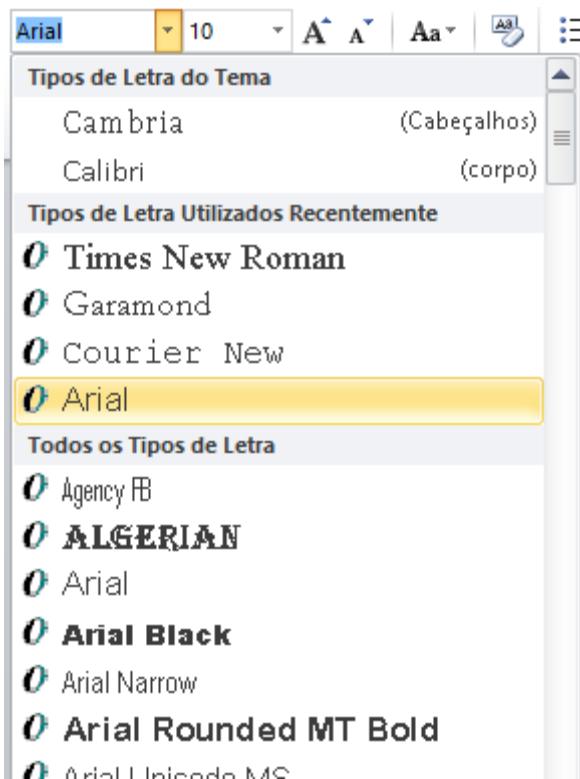


Option ordering

Conventional



Alphabetic + frequency

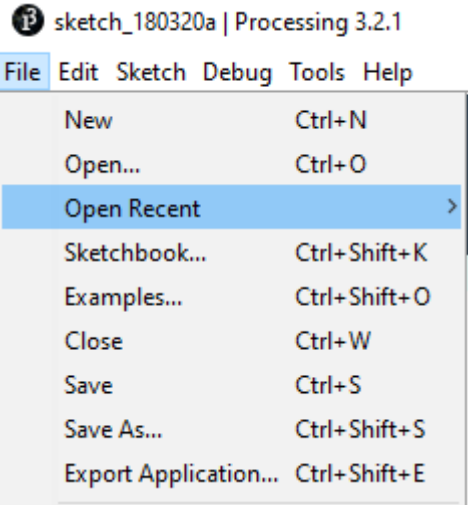
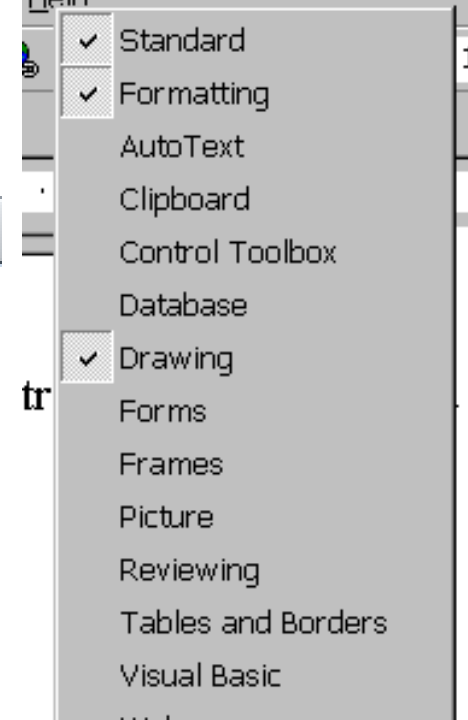
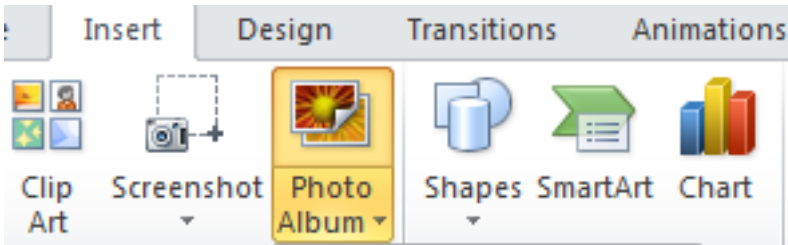
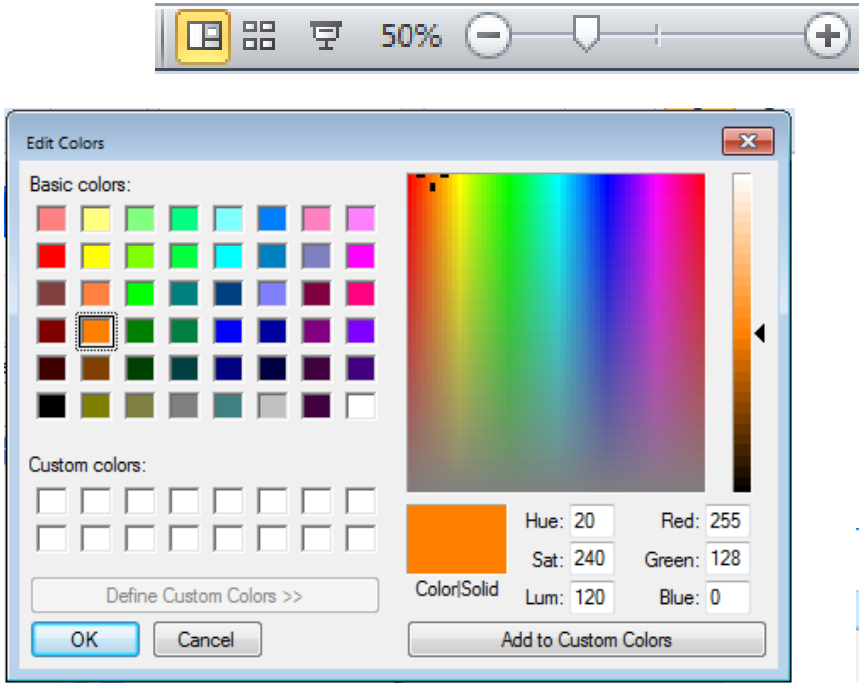
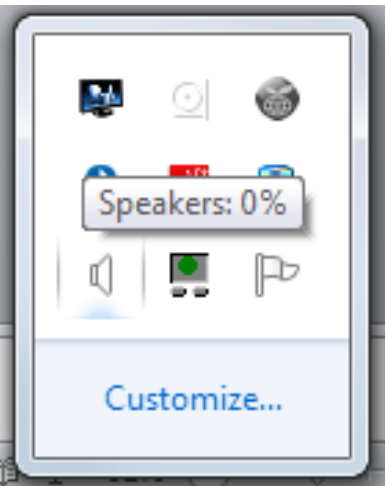
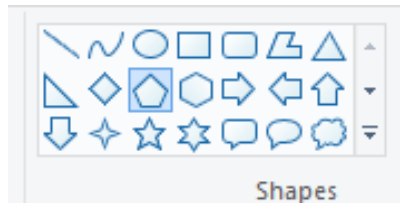
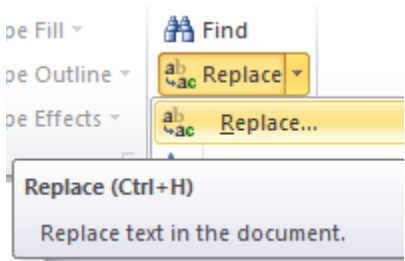


Category



Alphabetic

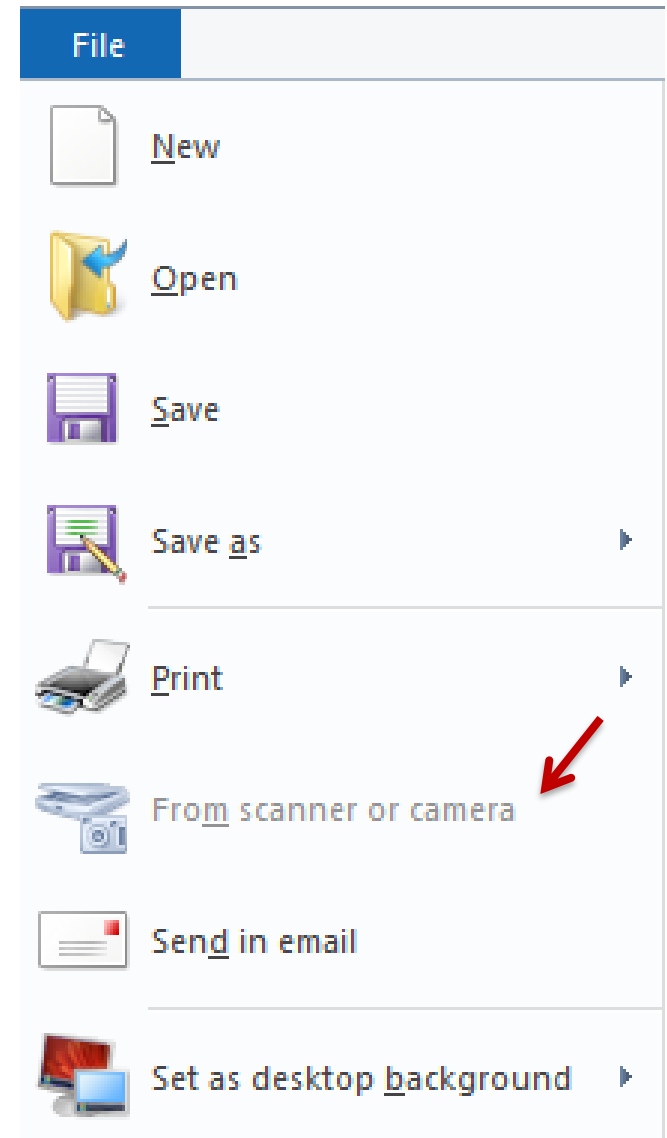
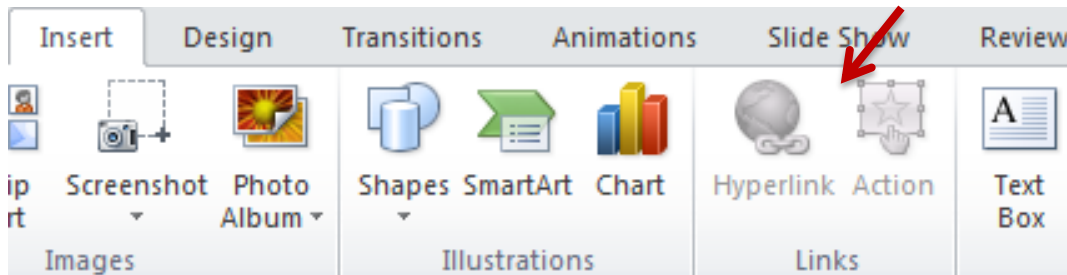
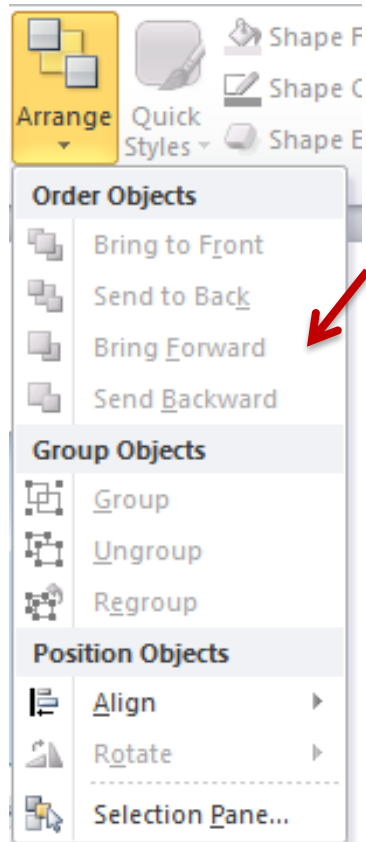
Give selection feedback



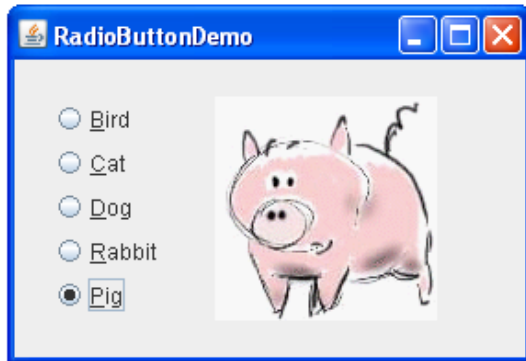
Indicate currently unavailable options

In grey to let users know they exist, but are unavailable

- Preventing errors
- And showing existing options (functionality)



Make clear the difference between choices of only one or several



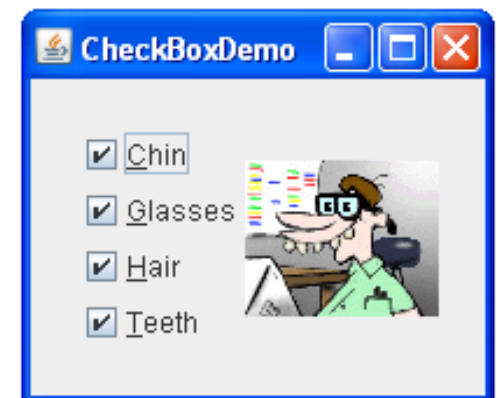
“Radio button”:
Only a single option
can be selected
from several
mutually exclusive
options

[Radio button - Wikipedia](#)

Effects

- | | |
|--|--|
| <input checked="" type="radio"/> No strikethrough | <input checked="" type="radio"/> No effect |
| <input type="radio"/> Strikethrough | <input type="radio"/> Shadow or outline |
| <input type="radio"/> Double strikethrough | <input type="checkbox"/> Shadow |
| | <input type="checkbox"/> Outline |
| <input checked="" type="radio"/> No super or subscript | <input type="radio"/> Emboss |
| <input type="radio"/> Superscript | <input type="radio"/> Engrave |
| <input type="radio"/> Subscript | |

“Check box”:
Permits to make a
binary choice.
A series of checkboxes
may be presented
The user may select
several of the choices





Select only one alternative:

	Service	From	To
<input type="radio"/>	AP No. 180	06:21	08:22
<input checked="" type="radio"/>	AP No. 130	07:21	09:22
<input type="radio"/>	IC No. 520	07:31	09:52

Possible to select more than one alternative:

☒ Additional seat options

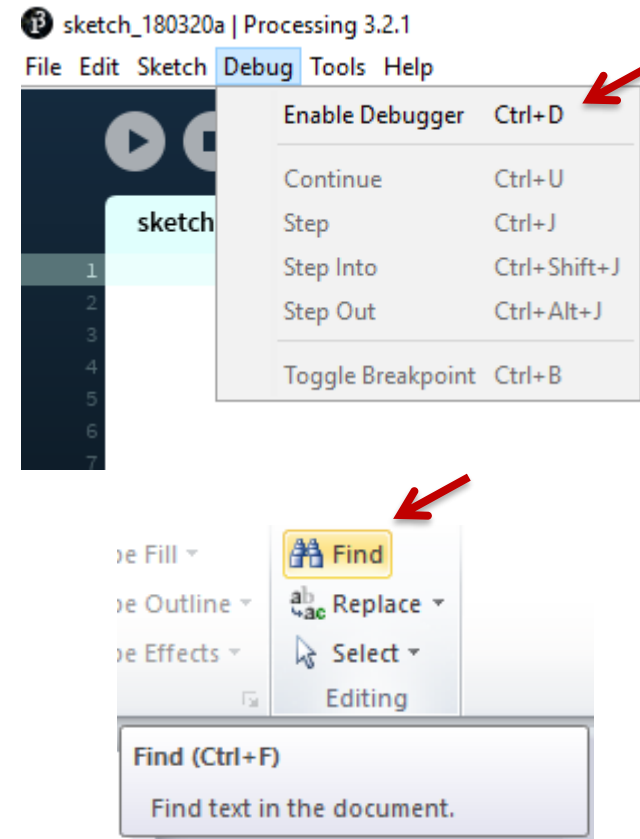
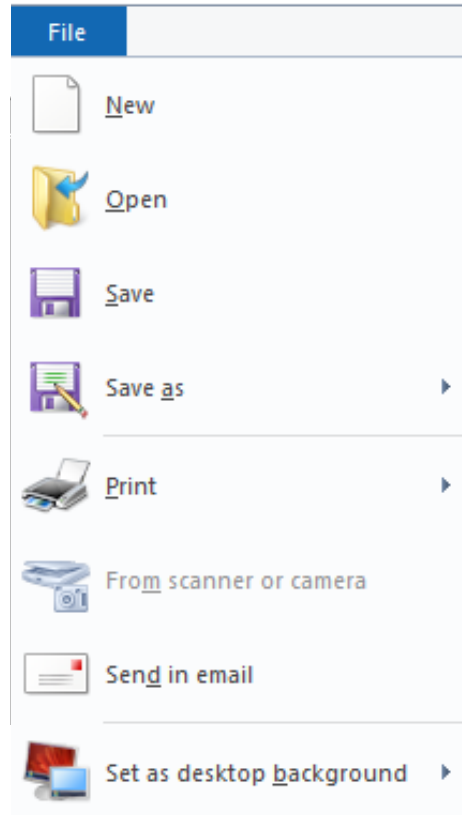
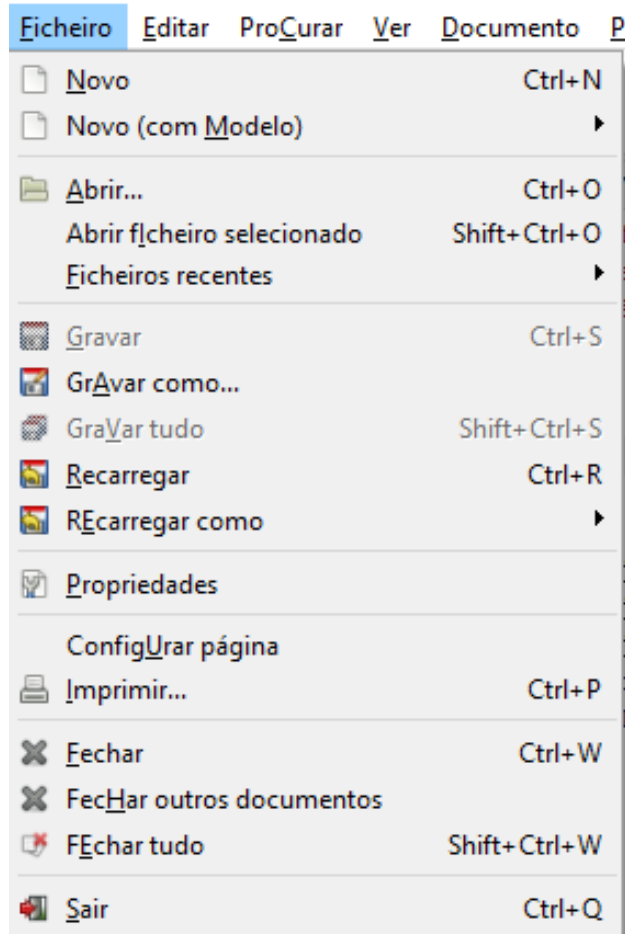
☐ Special needs seat 

☐ Bikes 

May we send you updates using e-mail?

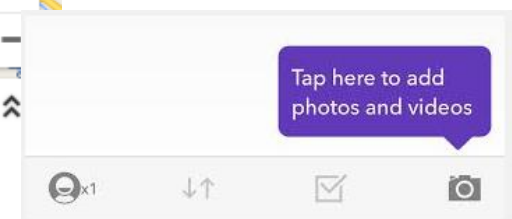
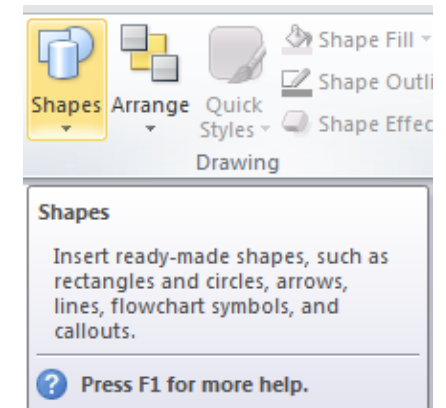
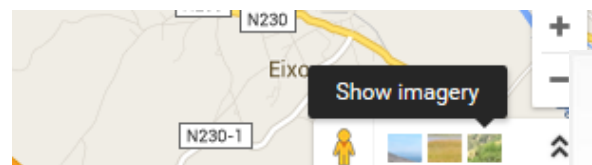
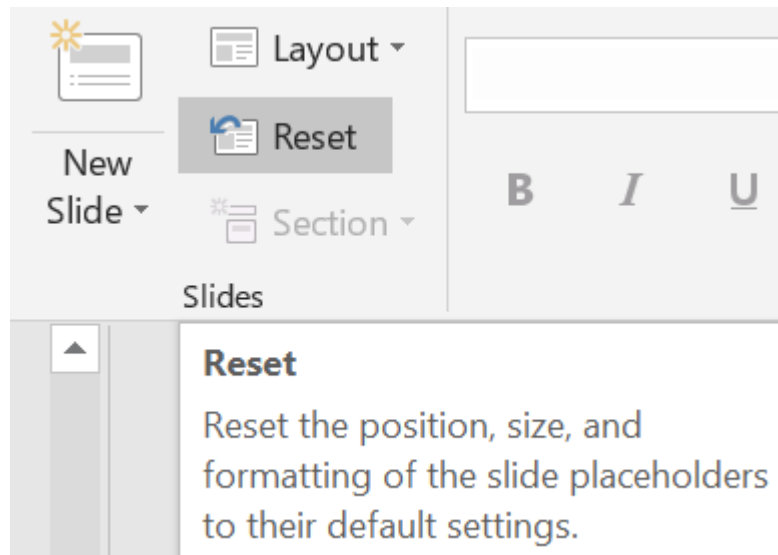
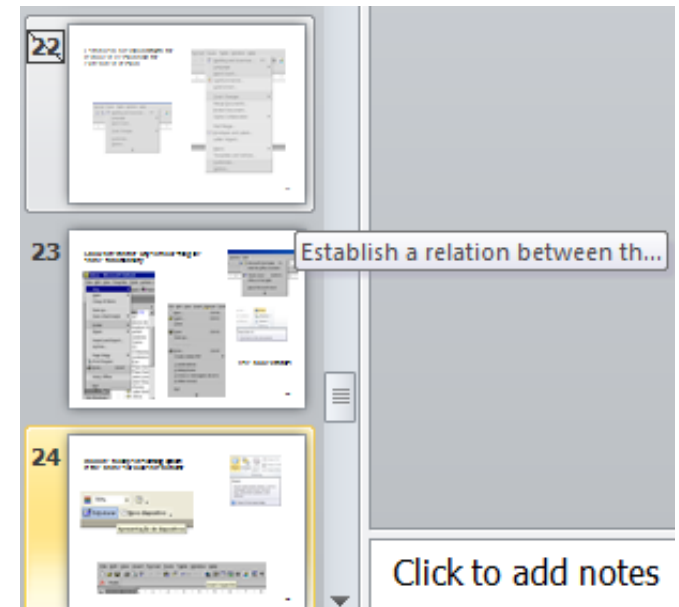
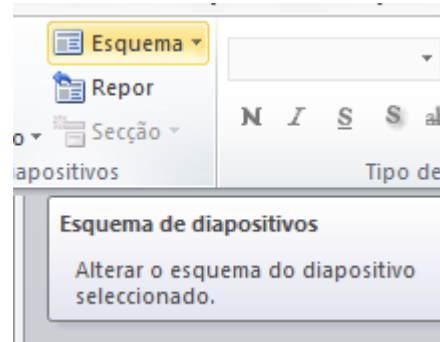
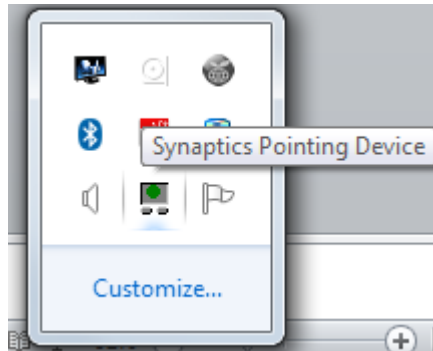
☐ Yes, please use e-mail to send me information about other offerings.

Show alternative ways of accessing the same functionality

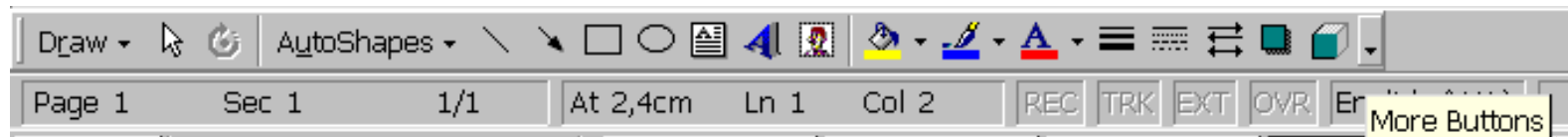
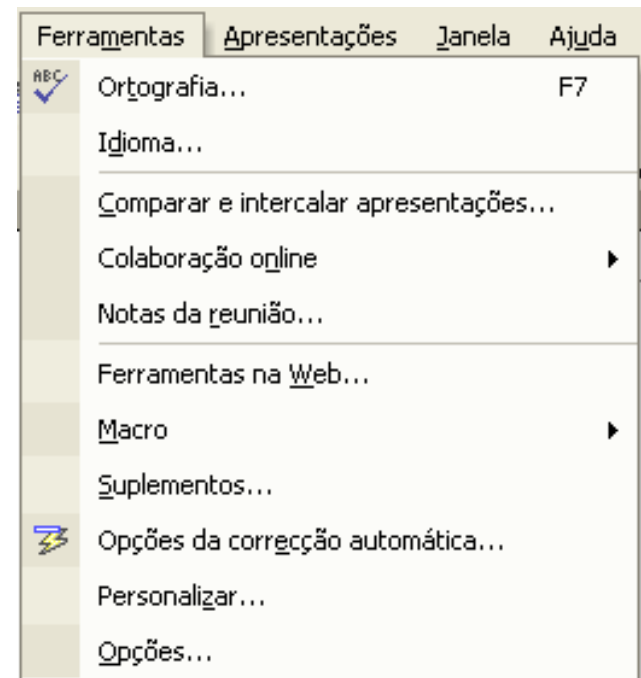
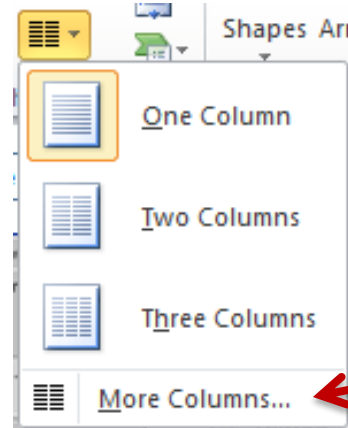
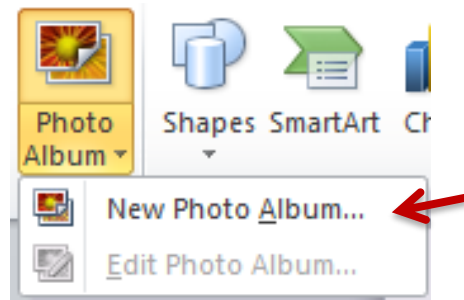
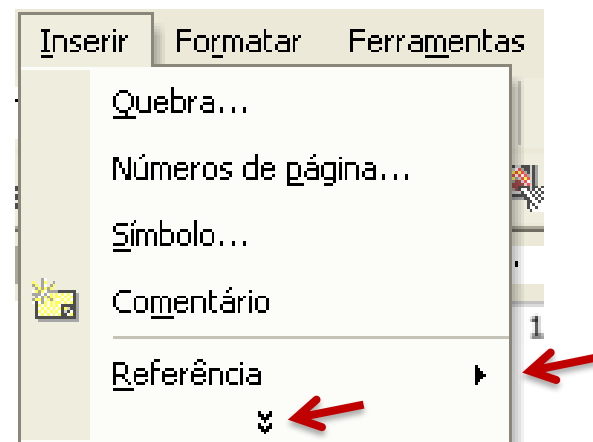
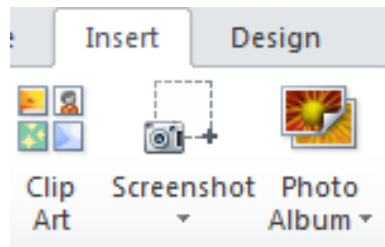


Use accelerators
(Flexibility and efficiency of use)

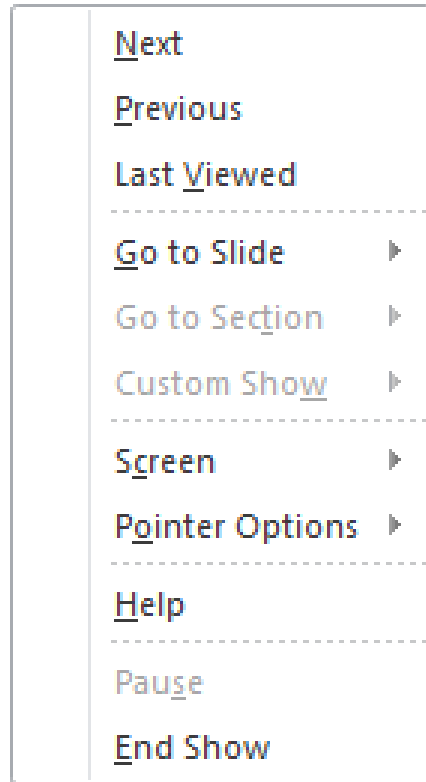
Include tooltips describing options if the names or icons are not clear



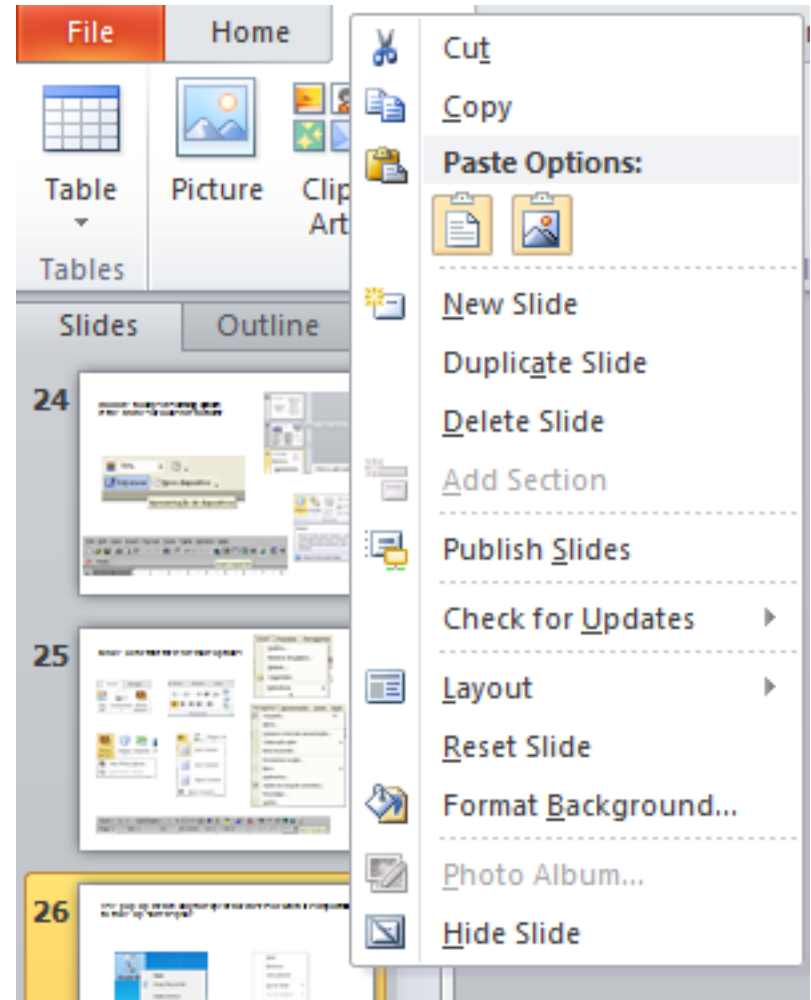
Make clear that there are more options



Use pop-up menus (context menus) only for experienced users or when it is very important not to take up screen space



(e.g.:
during a Power Point presentation)



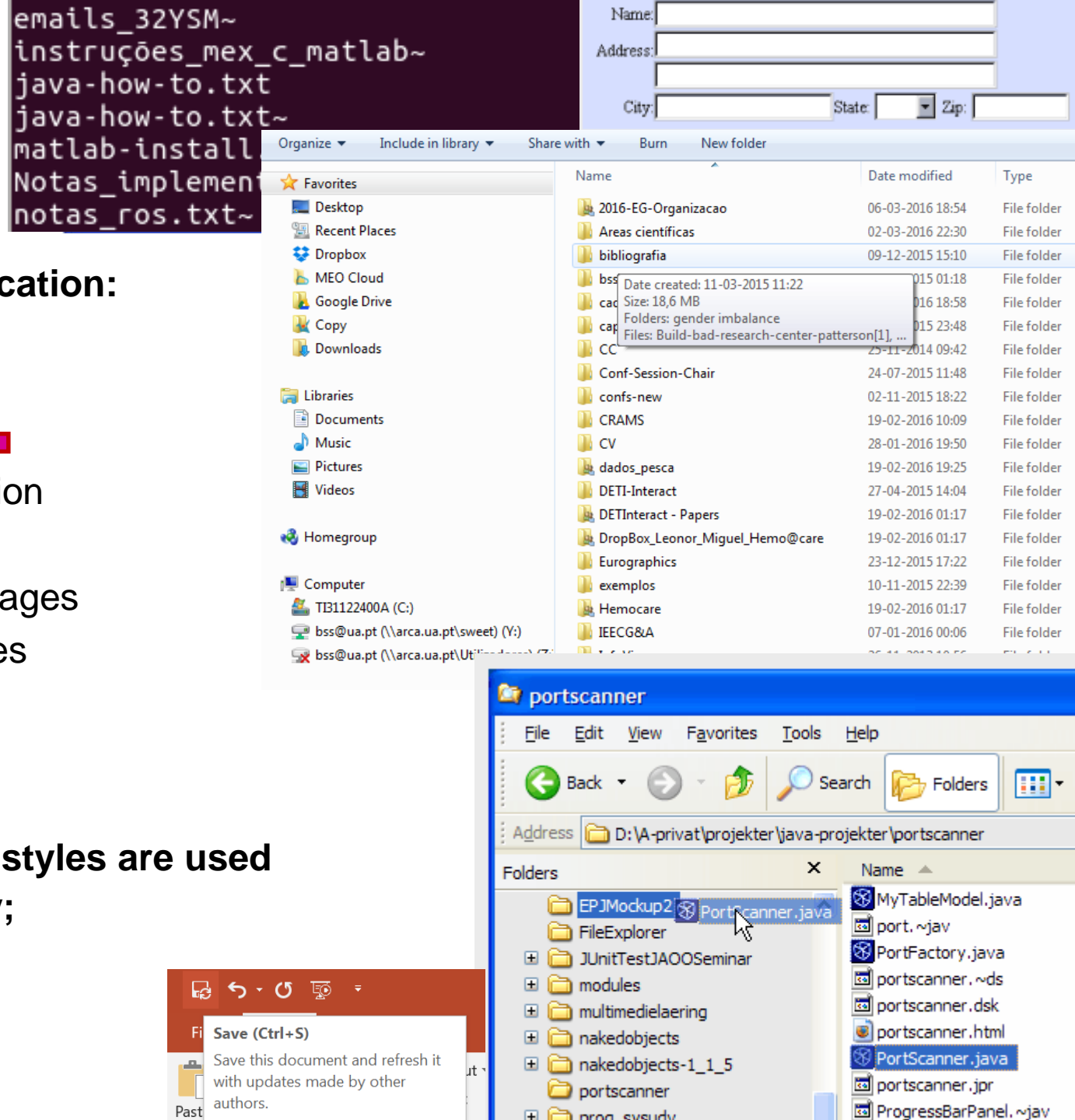
Interaction styles

A possible classification:

- Menus ✓
- Fill-in-forms ←
- Direct manipulation
- Function keys
- Command languages
- Natural languages
- ...

Often two or more styles are used simultaneously;

Why?



Fill-in forms

Endereço  http://www.ameda.com/cgi-win/cgw.cgi?ADD

BUSINESS ADDRESS (Required)

denotes a required field in this business address block.

First Name

Last Name

Title

Company

Street Address

Department/Mail

Stop

City

State/Province

Zip/Postal Code

USA/U.S. Military: Enter Zip +4 code without the hyphen (e.g. 123456789)
CANADA: Enter postal code per usual (e.g. A1B 2C3)

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☐ Alfa Pendular

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☐ Regional

☐ Urbano

VOLTA

Data 

pelas Horas

- Fill in forms are particularly useful for routine, clerical work or for tasks that require much data entry
- The concept already existed long ago
- Currently they are often used with other styles



```

PINE 3.96  ADDRESS BOOK (Edit)

Nickname : NBA
Fullname  : Players in the NBA
Fee       :
Comment   :
Addresses : mjordan@nba.com,
            kmalone@nba.com,
            drobinson@aol.com

^G Get Help  ^X eXit/Save  ^R RichView  ^V PrvPg/Top
^C Cancel    ^U NxtPg/End
  
```

Main advantages and disadvantages

Advantages (potential)

- Self-explanatory
- Recognition instead of recall
- Allow many different inputs (unlike menus)
- Give context and guide the user
- New functionality is visible (unlike command languages)

Disadvantages

- Imply knowledge of valid inputs
- Error prone
- Not very flexible

Fill in form design: relevant aspects in design

- Organization and layout
- Titles and fields
- Input formats
- Instructions and help
- Navigation
- Error handling

Fill in form design: guidelines

Which is preferable?

Example:

Zip code:

Name:

Country:

Address:

City:

Name:

Address:

Zip code:

City:

Country:

Avoid unfamiliar layouts!

Provide a menu when possible inputs are known
(combining two interaction styles...)

Timetables and Prices

Aveiro

10|April, 2018

◀

April 2018

▶

Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	1	2	3	4	5

Lis|

Lisboa - Cais do Sodre

Lisboa - Entrecampos

Lisboa - Oriente

Lisboa - Rossio

Lisboa - Santa Apolonia

Lisboa - Sete Rios

Cartão

Mastercard

Número do cartão

Data de validade

MM / AA

Titular do cartão

Titular do cartão

Cód. de segurança

Cód. de segurança

Payment options

Payment options*: Visa/MasterCard/Eurocard

Billing currency*:

Card number*:

Card type*: Visa

Card expiration date*: Month Year

CVV2/CVC2 code*:

Card holder name*:

Provide a format for fields that may be ambiguous

Show which fields are mandatory

Audio/Multimédia

- » Apontadores Multimédia
- » Auscultadores/Microfones
- » Colunas de som
- » Emissores FM
- » Leitores de Mp3
- » Placas de Som
- » WebCams

Caixas ATX/Fontes

- » Barebones
- » Caixas ATX
- » Fontes

Câmaras Digitais

- » Acessórios
- » Câmaras
- » Cartões de Memória

Captura de TV/Video

- » Placas de Edição de Video
- » Placas de TV

CD/DVD

- » Bolsas
- » Caixas
- » Cd/R/RW
- » DVD/R/RW

Computadores

- » Acer
- » Configurações Mbit

Consumíveis

- » Epson
- » HP
- » Tinteiros

Reciclados/Compatíveis

Descontinuados/Ocasão

- » Descontinuados/Ocasão

Discos

Rígidos/Controladoras/Caixas para Disco

- » Acessórios p/ Disco
- » Caixas para Disco
- » Controladoras
- » Discos externos
- » Discos IDE
- » Discos p/ Portáteis
- » Discos SCSI

Mbit.pt > Registo de Clientes

Username*

Password*

Password*

Nome*

Email*

N.º de Contribuinte*

Morada*

Código Postal* -

Telefone*

Fax

Telemóvel

Data de Nascimento* 1 Jan 1995

Registar

● ● ● voltar

Área Cliente

Nome do utilizador:

Password:

OK

Registar

Recuperar Password

Informação

13 Anos de Experiência, 14 Lojas para o servir!

Loja 1 - Porto Torrinha

Pesquisa

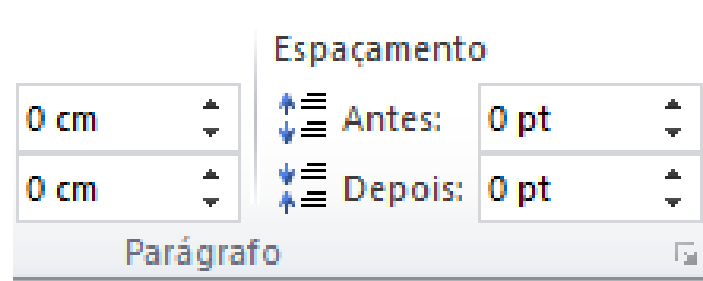
OK

Top Vendas

Usually indicated by *

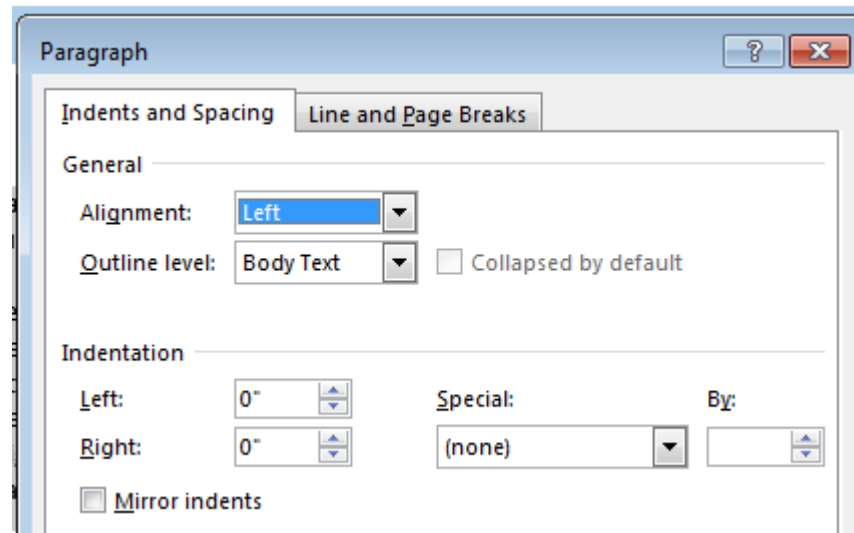
It should be possible for the user to choose the type of input (it prevents errors) or adapt to the context

Portuguese version (cm):



The image shows a dialog box titled "Espaçamento" (Spacing) with a "Parágrafo" (Paragraph) label at the bottom. It contains two input fields for "0 cm" with up and down arrows. To the right, there are two sections: "Antes:" (Before) and "Depois:" (After), each with a list icon, a double arrow icon, and an input field for "0 pt" with up and down arrows.

English version (inches):



The image shows a "Paragraph" dialog box with two tabs: "Indents and Spacing" and "Line and Page Breaks". The "General" section includes "Alignment:" set to "Left" and "Outline level:" set to "Body Text". The "Indentation" section includes "Left:" and "Right:" both set to "0\"", "Special:" set to "(none)", and "By:" with a spinner. There is a checkbox for "Mirror indents".

Instructions to fill the fields should be clear as well as messages

Messages

Headers: ☐ Show brief headers on incoming messages (recommended)
☐ Show all headers on incoming messages

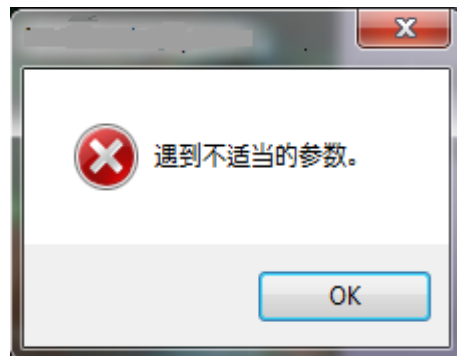
Font Size: (plain text only)

Screen Width: characters (range: 50 - 99 chars.)
(viewing plain text mail) This is the maximum line length of your incoming messages.
The default value is 72.

Screen Width: characters (range: 50 - 99 chars.)
(composing plain text mail) This is the maximum line length of your outgoing messages. The default value is 55.

Security: ☐ Block HTML graphics in email messages from being downloaded [[What's This?](#)]
☒ Warn me about sending information outside Yahoo!

This message did not help me much...



Main Bibliography

- Ben Shneiderman, C. Plaisant, M. Cohen, et al., *Designing the User Interface-Strategies for Effective Human–Computer Interaction*, Pearson, 6th edition, 2016
- Mads Soegaard, Interaction Styles, In: Soegaard, Mads and Dam, Rikke Friis (eds.). *The Encyclopedia of Human-Computer Interaction*, 2nd Ed. Aarhus, Denmark: The Interaction Design Foundation
[Interaction Styles | The Glossary of Human Computer Interaction](#)