

Visual Design and Fluid Navigation

User Experience Design

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Academic Year 2023/2024

Hall of Fame or Shame?

The screenshot shows the 'Teaching portal' of the Politecnico di Torino. The header includes navigation links for 'The Politecnico', 'Teaching', 'Research', 'Business', and 'International Campus', along with language options 'ITA | ENG', a login button, and a search bar. The main content area is a grid of service tiles:

- Course catalogue:** Course catalogue, curricula, course syllabi. Special projects: Young Talent Project and Alta Scuola Politecnica.
- Student Guide:** Find the Student Guide of your degree programme.
- Student services:** Exam dates, course finder, lecture rooms, libraries, course timetables, Language Centre, thesis proposals, support services, cultural activities and much more.
- Notice board:** News and events from the Office of the University Registrar, the Office of Student Services and the various degree programmes.
- Apply@polito:** Politecnico di Torino online application service (all levels and programmes).
- Orientation:** Choosing your degree programme, application information and services for Polito and high school students.
- Fees, scholarships and prizes:** Tuition fees and reductions, IELTS payment policy, scholarships and financial aid, part-time on-campus jobs, university residences and much more.
- Study abroad:** International mobility for students, faculty and staff; calls for applications for study periods at foreign universities, thesis and internships abroad, teaching mobility, international.
- News - events - notices:** For further informations click here.
- Career service:** Internships and job placements for students and graduates, recruiting services for employers.
- Graduates:** State examination for professional practice, alumni, AlmaLaurea.
- Regulations / Student discipline:** Regulations, Disciplinary Board.
- Teaching Quality Assurance:** Teaching Quality Assurance, Joint Committee on Teaching, regional accreditation.

The footer contains contact information: 'Posta Studenti email', 'Ente Regionale per il Diritto allo Studio Universitario', 'Contact us', 'Lezioni online demo', 'osservatorio regionale', 'POLITECNICO DI TORINO', and 'PoliTO App'. It also includes social media icons and the address: '© Politecnico di Torino, Corso Duca degli Abruzzi, 24 - 10129 Torino, ITALY'.

Hall of Fame or S

Bachelor's degree programmes	Young Talent Project
Master's degree programmes	Alta Scuola Politecnica
Specializing Master's programmes and Lifelong Learning	Ph.D. programmes
	Postgraduate School
Curricula and course syllabi of current and previous years	Summer School

STUDENT GUIDE (2019 - 2020)

All guides

Area Course

Architecture 1st level
Bachelor's degree programme in ARCHITECTURE
Location: Torino - Class: ARCHITECTURE

Architecture 1st level
Bachelor's degree programme in ARCHITECTURE
Location: Torino - Class: ARCHITECTURE

Architecture 1st level
Bachelor's degree programme in DESIGN AND COMMUNICATION
Location: Torino - Class: INDUSTRIAL DESIGN

Architecture 1st level
Bachelor's degree programme in DESIGN AND VISUAL COMMUNICATION
Location: Torino - Class: INDUSTRIAL DESIGN

Architecture 1st level
Bachelor's degree programme in TERRITORIAL, URBAN, ENVIRONMENTAL AND LANDSCAPE PLANNING
Location: Torino - Class: TOWN, REGIONAL AND ENVIRONMENTAL PLANNING

Architecture 2nd level
Master's degree programme in ARCHITECTURE CONSTRUCTION CITY
Location: Torino - Class: ARCHITECTURE AND ARCHITECTURAL ENGINEERING

Architecture 2nd level
Master's degree programme in ARCHITECTURE FOR THE SUSTAINABILITY DESIGN
Location: Torino - Class: ARCHITECTURE AND ARCHITECTURAL ENGINEERING

Architecture 2nd level
Master's degree programme in ARCHITECTURE HERITAGE PRESERVATION AND ENHANCEMENT
Location: Torino - Class: ARCHITECTURE AND ARCHITECTURAL ENGINEERING

Architecture 2nd level
Master's degree programme in ECODESIGN
Location: Torino - Class: DESIGN

Architecture 2nd level
Master's degree programme in SYSTEMIC DESIGN
Location: Torino - Class: DESIGN

Architecture 2nd level
Master's degree programme in TERRITORIAL, URBAN, ENVIRONMENTAL AND LANDSCAPE PLANNING
Location: Torino - Class: REGIONAL, URBAN AND ENVIRONMENTAL PLANNING

Engineering 1st level
Bachelor's degree programme in AEROSPACE ENGINEERING
Location: Torino - Class: INDUSTRIAL ENGINEERING

Teaching portal

Exam dates	Course finder	C.I.A. Language Center	Course Timetables
Thesis proposals	Support services	Research Labs	Campus maps
Student teams	Register of student societies	Libraries	Study rooms
Student projects	Donations (5X1000)	University residences	Free room finder
Mobility and Cultural	Sports activities	Poito Wi-Fi	

Course catalogue

Student Guide

Student services

Notice board

Apply@polito

Orientation

Fees, scholarships and prizes

Study abroad

News - events - notices

Career service

Graduates

Regulations / Student discipline

Teaching Quality Assurance

Generale	Area dell'Architettura Corsi di Laurea di 1° livello	Area dell'Architettura Corsi di Laurea Magistrale
Studenti	Area dell'Ingegneria Corsi di Laurea di 1° livello	Area dell'Ingegneria Corsi di Laurea Magistrale

Welcome to Apply@polito - the online application service of the Politecnico di Torino

Bachelor Italian students

M.S. Italian students

Students with a foreign qualification

Ph.D.

Specializing master

Exchange programmes

State exams

Online application form

Privacy - Information

Forgot your password?

Fees and Reductions	Part-time Collaborations	Halls of residence
Researching activity announcements	Scholarships and prizes	External Institutions' announcements
News - events - notices		

Almaurea	Esami di stato	Ex allievi	Certificati e autocertificazioni
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STUDENTS & GRADUATES

EMPLOYERS

EVENTS

TECH TALK VISHAY

VIDEO GALLERY

Home

Come orientarsi al Polito

Iscrizione al primo anno

Materiale informativo

Attività con le scuole medie superiori

Registrazione ad apply@polito

Link correlati

Consulta le graduatorie per l'ammissione all'a.a. 2019/20

Come orientarsi al Polito

Iscrizione al primo anno

Materiale informativo

Alta Scuola Politecnica

Visual Design

Aesthetics for helping users in understanding and navigating the UI

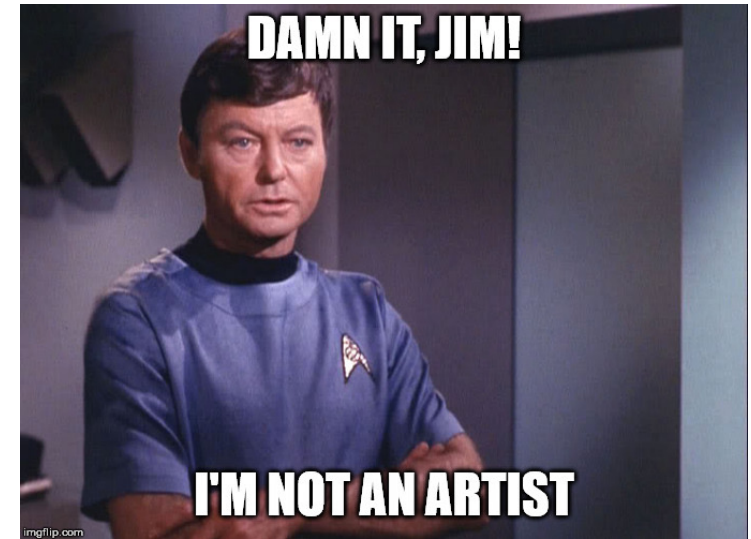
Visual Design

- **Guiding:** conveying structure, relative importance, relationships
- **Pacing:** drawing people into your app, orienting them, and showing where to go, providing hooks to dive deeper
- **Messaging:** expressing meaning and style, breathing life into your content
- Both at the conscious and sub-conscious levels

- And also...
 - Making everything look aesthetically beautiful (but this is not the goal)

Visual Design vs. Art and Artistic Skills

- A.k.a. «Help, I'm not an artist!»
- Artistic skills help a bit but are neither necessary nor sufficient
- Art does not need to be practical; design does
- Real design skills take years to master
- Widely-accepted heuristics are a good and easy start



The Basics of Visual Design

Basic visual design involves text, layout, and colors. First let's start with text. Gracefully using whitespace helps separate out logical chunks of content. Next, font size and style differences convey hierarchy. Finally, alignment is crucial for helping readers scan quickly.

Whitespace

Basic visual design involves text, layout, and colors. First let's start with text.

Gracefully using whitespace helps separate out logical chunks of content.

Next, font size and style differences convey hierarchy.

Finally, alignment is crucial for helping readers scan quickly.

Hierarchy

Basic visual design involves ...

Text

Gracefully using whitespace helps separate out logical chunks of content.

Next, font size and style differences convey hierarchy.

Finally, alignment is crucial for helping readers scan quickly.

Layout

Colors

Alignment

BASIC VISUAL DESIGN

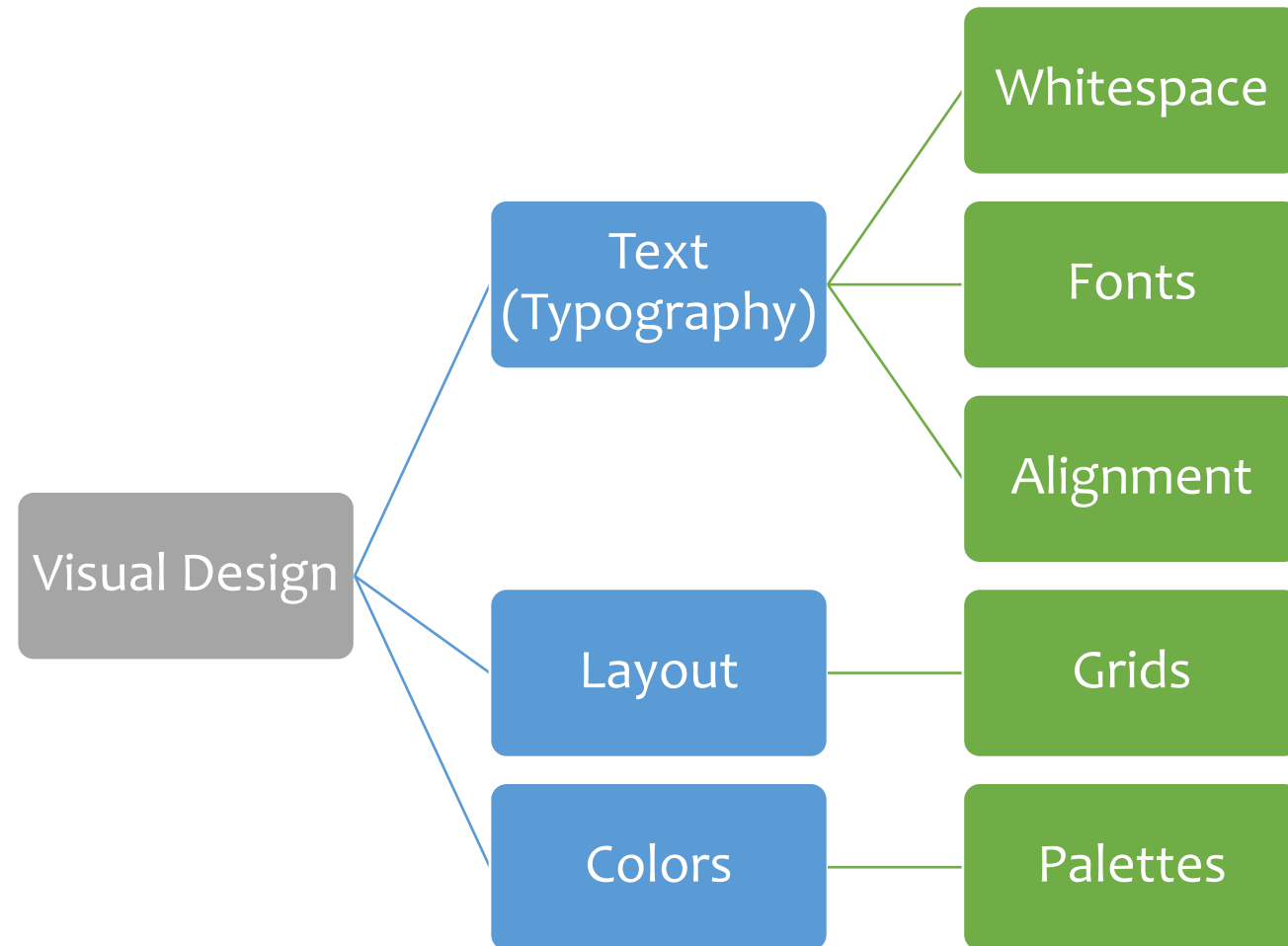
Text

- **Whitespace**: helps separate out logical chunks of content
- **Font**: size and style differences convey hierarchy
- **Alignment**: crucial for helping readers scan quickly

Layout

Colors

Key Ingredients



Recognizable Page Structure



Recognizable Page Structure

The image shows a screenshot of the CNN website's homepage, illustrating a recognizable page structure. At the top, there is a navigation bar with the CNN logo and various category links: World, US Politics, Business, Health, Entertainment, Style, Travel, Sports, and Videos. On the right side of the navigation bar, there are links for 'Edition', a search icon, and a user profile icon.

Below the navigation bar, there is a horizontal list of trending topics: **NEW PODCAST:** Tug of war | **COVID-19:** Vaccination tracker | **TRENDING:** Elon Musk | Oldest surviving Miss America dies | SpaceX toilet problem | Queen |

The main content area is organized into several sections:

- Primary Article:** A large article titled "Brazil has big green plans. But its track record is dismal" with a sub-headline "ANALYSIS". The image shows a large fire in a forest. Below the article, there is a sub-headline: "The Brazilian government is bringing ambitious promises to the UN climate summit, but can it be believed?".
- Developing Story:** A smaller article titled "22-story building collapses in Lagos, Nigeria" with a sub-headline "DEVELOPING STORY". The image shows a large pile of rubble.
- Analysis:** A smaller article titled "'Let's go Brandon,' explained" with a sub-headline "ANALYSIS". The image shows a man wearing a red mask with the text "LET'S GO BRANDON".
- Other News Items:** A list of other news items including "Two conservative justices seem open to arguments from abortion providers", "Barclays CEO quits after investigation into links with Jeffrey Epstein", "Missile attack on mosque and religious school kills and injures 29 Yemeni civilians", "At least 12 people killed and 52 injured in Halloween weekend mass shootings in US", "Reporter reveals what Lindsey Graham said during January 6 riot", "Analysis: Trump escalates Jan. 6 cover-up", and "Tigrayan forces accused of killing 100 youths".
- Manchin Issues Warning:** A section titled "Manchin issues warning to Democrats on Biden's economic package" with a sub-headline "Analysis: Tim Scott confirms he's on the Trump 2024 train".
- News and Buzz:** A section titled "News and buzz" featuring a photo of Elon Musk and a sub-headline "Elon Musk offers to sell Tesla stock 'right now' if UN can show how \$6 billion would".
- Featured:** A section titled "Featured" featuring a black and white portrait of a woman.
- Spotlight:** A section titled "Spotlight" featuring three small articles: "Man scheduled to be executed for murder he says he didn't commit seeks clemency", "Could Covid-19 vaccines impair a child's future fertility? Officials say no.", and "Kal Penn, 'Harold and Kumar' and 'House' star, comes out as gay".

Recognizable Page Structure



Recognizable Page Structure

The screenshot displays the Stack Overflow 'All Questions' page, illustrating a recognizable page structure. The layout is organized into several key sections:

- Header:** Includes the Stack Overflow logo, navigation links (About, Products, For Teams), a search bar, and user actions (Log in, Sign up).
- Left Sidebar:** Contains navigation options such as Home, PUBLIC (Questions, Tags, Users), COLLECTIVES (Explore Collectives), FIND A JOB (Jobs, Companies), and TEAMS (Stack Overflow for Teams).
- Main Content Area:** Titled 'All Questions', it shows a total of 21,855,928 questions. It features a filter bar with options like Newest, Active, Bountied (326), Unanswered, and More. Below this, a list of questions is displayed, each with a title, a brief description, tags, and user information.
- Right Sidebar:** Contains several sections including 'The Overflow Blog' with recent posts, 'Featured on Meta' with announcements, 'Collectives' with community groups like Go Language and Google Cloud, and 'Related Tags' with a list of popular tags and their question counts.

Recognizable Page Structure

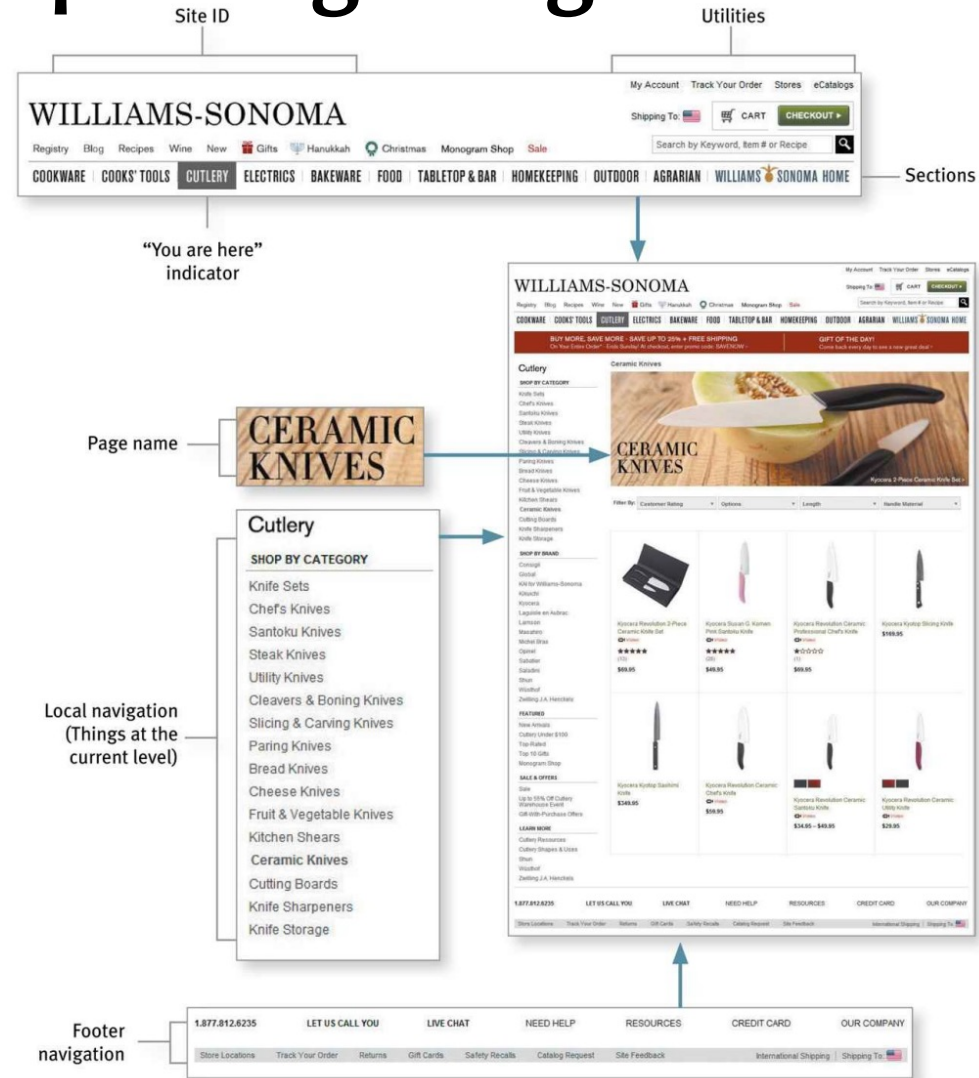


Recognizable Page Structure

The screenshot displays the TripAdvisor website interface for searching hotels in New York City. The page is structured as follows:

- Header:** TripAdvisor logo, search bar, and navigation links: "Scrivi una recensione", "Viaggi", "Avvisi".
- Navigation:** "New York City", "Hotel", "Cose da fare", "Ristoranti", "Voli", "Case vacanza", "Pacchetti vacanza", "Crociere", "Autonoleggio".
- Breadcrumbs:** "Stati Uniti > New York (NY) > New York City > Hotel New York City".
- Map:** A map of New York City with a "Guarda la mappa" button.
- Search Filters:** "Arrivo" (check-in) and "Partenza" (check-out) date pickers, and "Ospiti" (guests) selection: "1 camera, 2 adulti, 0 bambini".
- Main Content:** "911 strutture a New York City" with a sorting dropdown set to "Qualità-prezzo".
- Filters (Left Sidebar):**
 - COVID-19:** "Strutture che adottano misure di sicurezza" (unchecked).
 - Offerte:** "Cancellazione gratuita", "Prenota ora, paga quando soggiorni", "Strutture con Offerte Speciali" (all unchecked).
 - Prezzo:** Range from 0 € to + 623 €, with a "Prezzo + tasse e spese" dropdown.
 - Molto richiesti:** "5 stelle e oltre" (316), "4 stelle" (148), "Colazione inclusa" (64), "5 stelle" (14).
- Hotel Results:**
 - Fairfield Inn & Suit...:** 1.865 reviews, 269 € (crossed out), 161 € (current price), "Vedi l'offerta".
 - Fairfield Inn & Suites New York Midtown Manhattan/Penn Station:** Sponsored listing, 1.865 reviews, 161 €, "Vedi l'offerta". Features include: "Colazione inclusa", "Info sull'hotel", "Visita il sito dell'hotel", "00 1 212-563-0900", "Offerta Speciale", "Cancellazione gratuita", "Prenota ora, paga quando soggiorni", "Connessione Wi-Fi gratuita", "Bar/Lounge", "Centro fitness", "Misure di sicurezza adottate".

Conventions Help Recognizing Structure



‘Gestalt’ principles

Hints from the psychology of Shapes and of Representation

Gestalt principles

- Laws from 1920s' psychology: how humans typically see objects by grouping similar elements, recognizing patterns and simplifying complex images
- Designers use these to engage users via powerful -yet natural- “tricks” of perspective and best practice design standards
- *“The whole is other than the sum of the parts” - Kurt Koffka*



<https://www.interaction-design.org/literature/topics/gestalt-principles>

<https://www.usertesting.com/blog/gestalt-principles/>

Some Gestalt Principles

- **Figure/Ground:** Disliking uncertainty, we look for solid, stable items. Foreground catches the eye first
- **Closure:** Preferring complete shapes, we automatically fill in gaps to perceive a complete image; we see the whole first
- **Common Region:** We group elements that are in the same closed region
- **Element Connectedness:** We group elements linked by other elements
- **Continuation:** We follow and “flow with” lines
- **Proximity (Emergence):** We group closer-together elements, separating them from those farther apart.
- **Good Form:** We differentiate elements that are similar in color, form, pattern, etc. and cluster them together
- **Meaningfulness (Familiarity):** We group elements if they form a meaningful or personally relevant image.
- **Prägnanz:** We perceive complex images as simple ones.
- **Convexity:** We perceive convex shapes ahead of concave ones
- **Regularity:** Sorting items, we tend to group some into larger shapes, and connect elements that form a pattern.
- **Similarity (Invariance):** We seek differences and similarities in an image and link similar elements.
- **Symmetry:** We seek balance and order in designs, struggling to do so if they aren’t readily apparent.
- **Common Fate:** We group elements that move in the same direction
- **Synchrony:** We group static visual elements that appear at the same time.

Examples: Figure-ground



Basecamp 3

Version 3 is all new for 2016!

Working with other people? Struggling to keep everyone on the same page?

DID WE GET THAT DONE YET? WAIT, WHO MADE THAT DECISION? WHEN IS THIS DUE? WHERE DO I PUT THAT? NO ONE TOLD ME THAT! WHO SENT THIS TO THE CLIENT? THIS IS EXHAUSTING!

Sign up now for free below

Just last week, 10,772 companies got started with Basecamp 3!

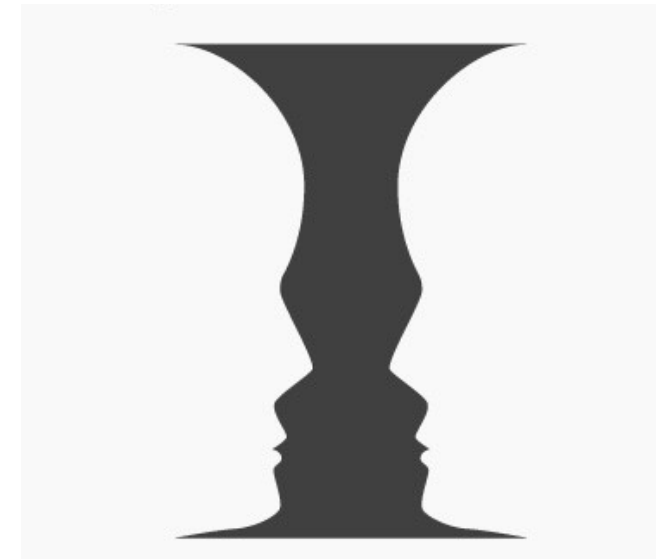
Sign up using Google

Or, sign up with your email

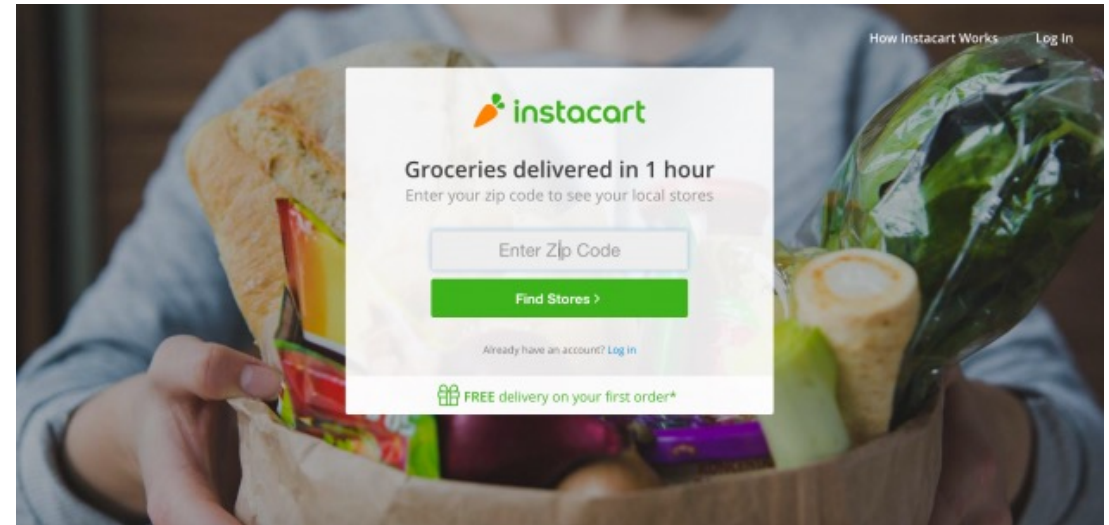
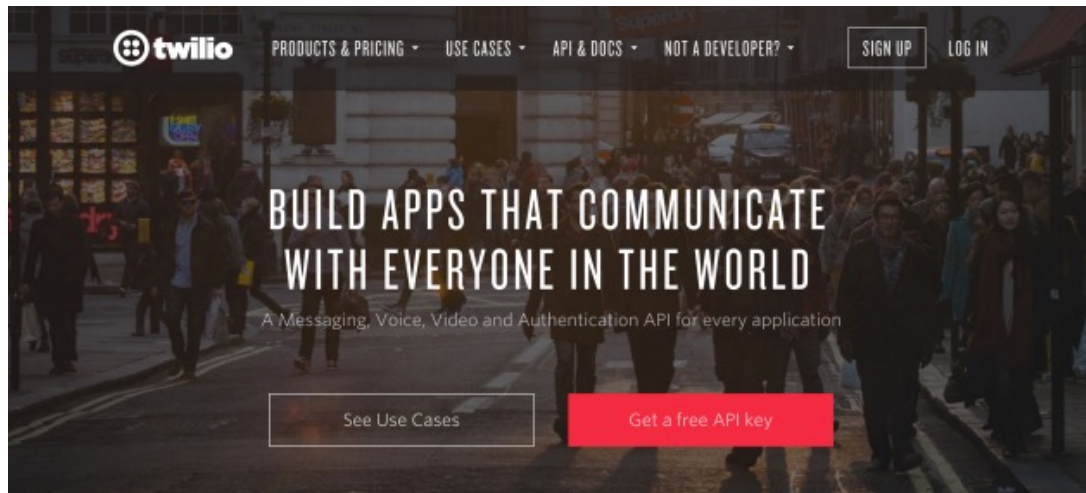
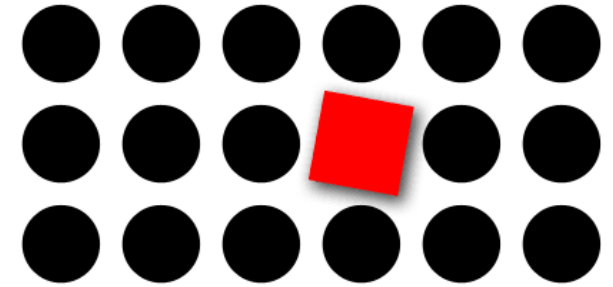
Your Name
Julie Applesseed

Your Email
julie@widgetco.com

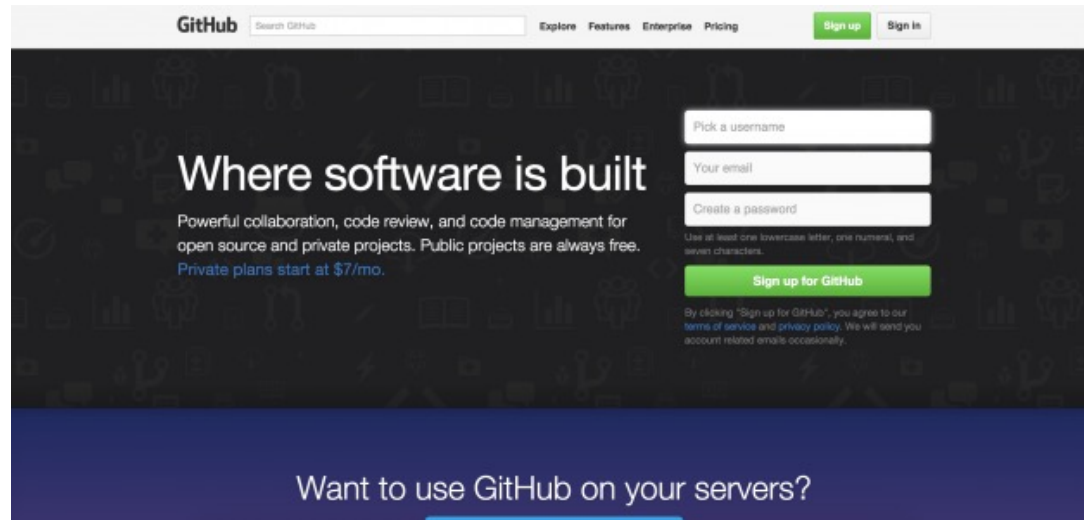
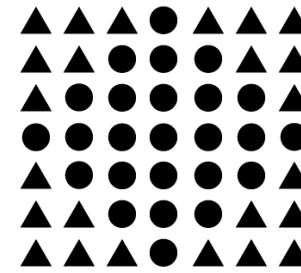
Company/Organization
Widget, Co.



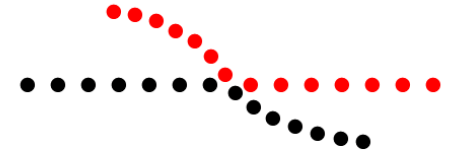
Examples: Focal Point



Examples: Similarity



Examples: Continuity



Customers Who Bought This Item Also Bought

Page 1 of 20

Five book recommendations are displayed in a row, each with a left and right navigation arrow. The books are:

- Crossing the Chasm, 3rd Edition: Marketing and Selling Disruptive Products** by Geoffrey A. Moore. Paperback, 72 pages. \$12.35 ✓ Prime. Rating: 4.5 stars.
- The Lean Startup: How Today's Entrepreneurs Use Continuous Innovation to** by Eric Ries. Hardcover. \$16.66 ✓ Prime. Rating: 4.5 stars, 1,062 reviews.
- The Innovator's Dilemma: The Revolutionary Book That Will Change the Way** by Clayton M. Christensen. Paperback. \$10.06 ✓ Prime. Rating: 4.5 stars, 209 reviews. #1 Best Seller in Industrial Management.
- The Innovator's Solution: Creating and Sustaining Successful Growth** by Clayton M. Christensen. Hardcover. \$18.33 ✓ Prime. Rating: 4.5 stars, 22 reviews.
- How Will You Measure Your Life?** by Clayton M. Christensen. Hardcover. \$15.66 ✓ Prime. Rating: 4.5 stars, 583 reviews.



Step 1

Choose your meals, drinks and treats from our daily rotating menu.



Step 2

Our friendly servers organize your food for delivery - hot and ready to eat!



Step 3

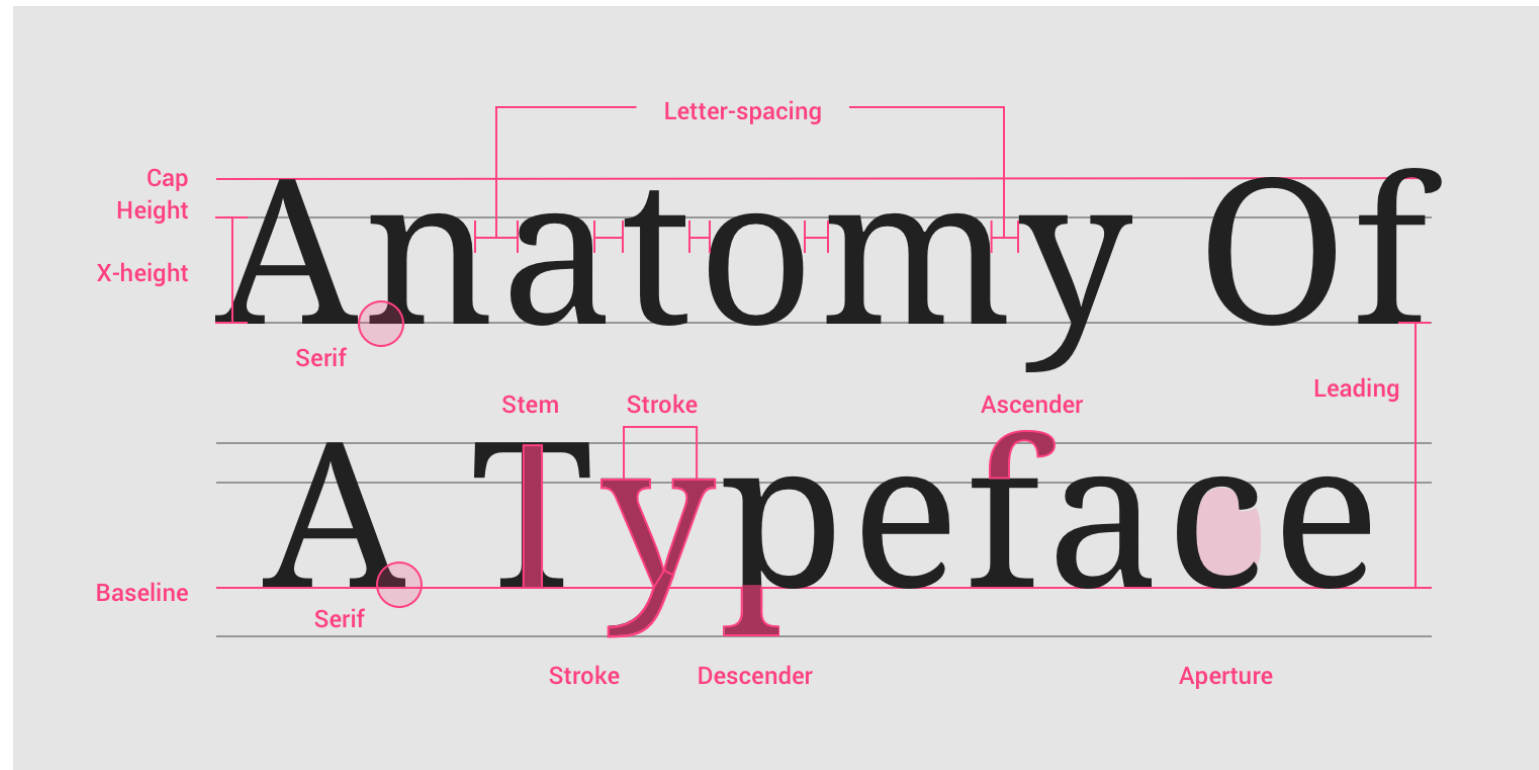
Your meal arrives in around 20 minutes - like a home-cooked meal without the effort!

Typography

Property of text

Characteristics of Text

- Point Size
- Leading
- Cap Height, x-height
- Ascenders, Descenders
- Weight
- Serifs



<https://material.io/design/typography/understanding-typography.html>

Example: Material Design Type Scale

A combination of 13 styles that are supported by the type system

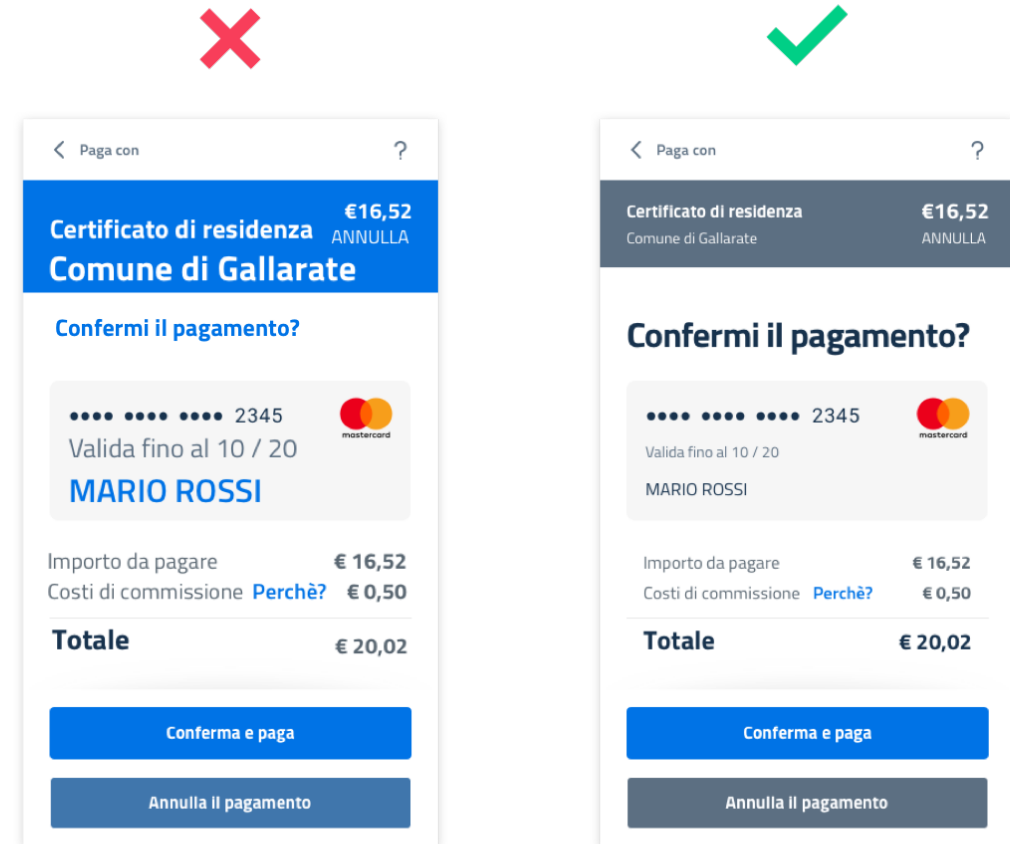
Reusable categories of text, each with an intended application and meaning

Scale Category	Typeface	Font	Size	Case	Letter spacing
H1	Roboto	Light	96	Sentence	-1.5
H2	Roboto	Light	60	Sentence	-0.5
H3	Roboto	Regular	48	Sentence	0
H4	Roboto	Regular	34	Sentence	0.25
H5	Roboto	Regular	24	Sentence	0
H6	Roboto	Medium	20	Sentence	0.15
Subtitle 1	Roboto	Regular	16	Sentence	0.15
Subtitle 2	Roboto	Medium	14	Sentence	0.1
Body 1	Roboto	Regular	16	Sentence	0.5
Body 2	Roboto	Regular	14	Sentence	0.25
BUTTON	Roboto	Medium	14	All caps	1.25
Caption	Roboto	Regular	12	Sentence	0.4
OVERLINE	Roboto	Regular	10	All caps	1.5

<https://material.io/design/typography/the-type-system.html#type-scale>

Text

- Font size, color and spacing define a hierarchy of visibility and attention
- The visual hierarchy should match the relative importance of the information content



<https://docs.italia.it/italia/designers-italia/design-linee-guida-docs/it/stabile/doc/user-interface/il-disegno-di-un-interfaccia-e-lo-ui-kit.html>

Text and Layout Convey Meaning

The image compares two real estate listing cards. The left card, marked with a red 'X', uses a list format for attributes. The right card, marked with a green checkmark, uses a more integrated layout with callouts explaining design choices.

Attribute	Value
Building Type:	Detached House
Year Of Construction:	2012
Listing Price:	\$750,000
Address:	742 Evergreen Terrace
Bedrooms:	3
Bathrooms:	2
Real Estate Agent:	Tiffany Heffner
Contact:	(555) 555-4321

Annotations for the right card:

- Present data in a more useful way:** Points to the summary line "DETACHED HOUSE - 5Y OLD".
- Emphasize the most important content:** Points to the price "\$750,000".
- Combine labels and values into human-readable phrases:** Points to the "3 Bedrooms" and "2 Bathrooms" line.

www.refactoringui.com

Refactoring UI

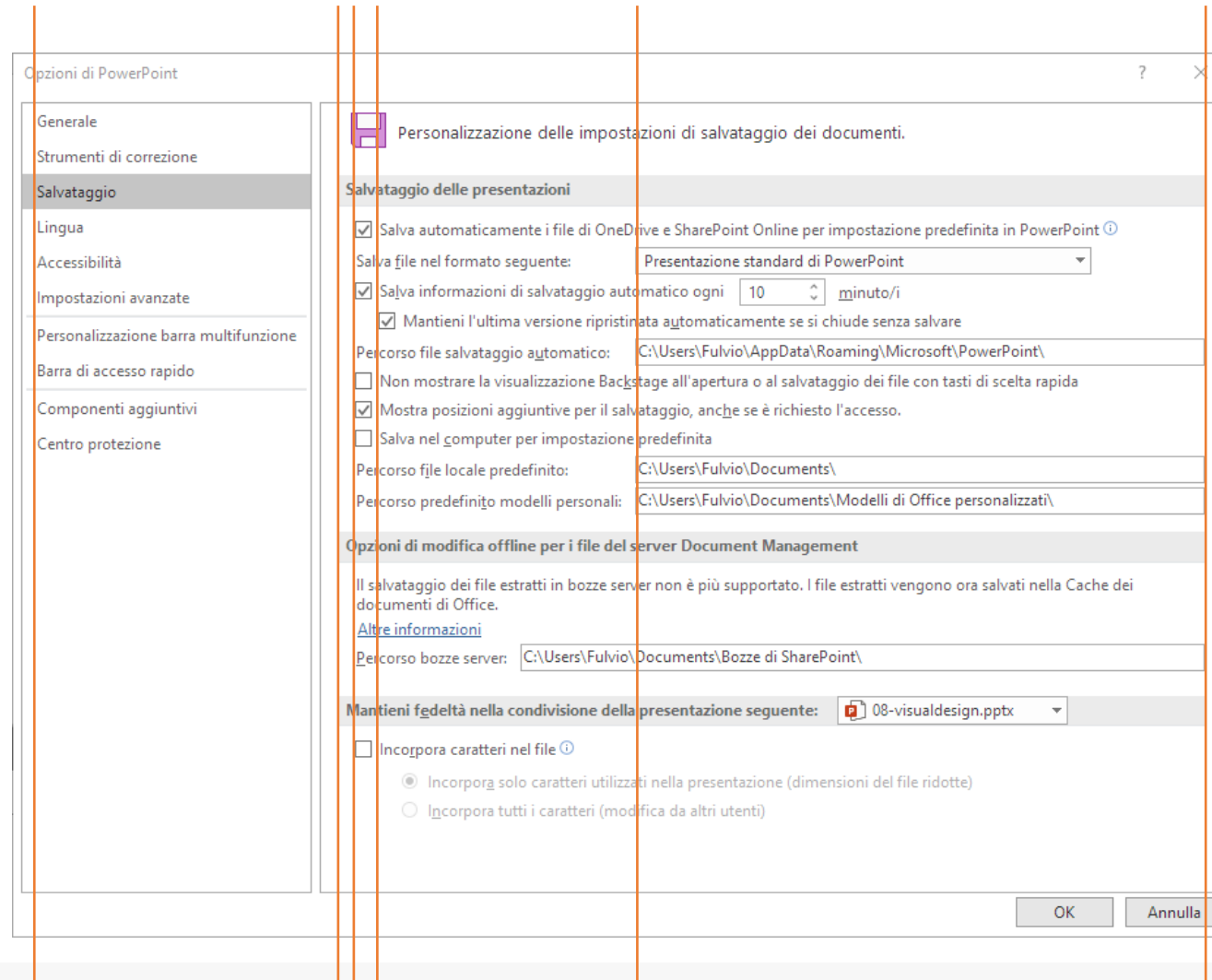
Grids and Alignment

Exploiting grouping and alignment to convey content, at different levels

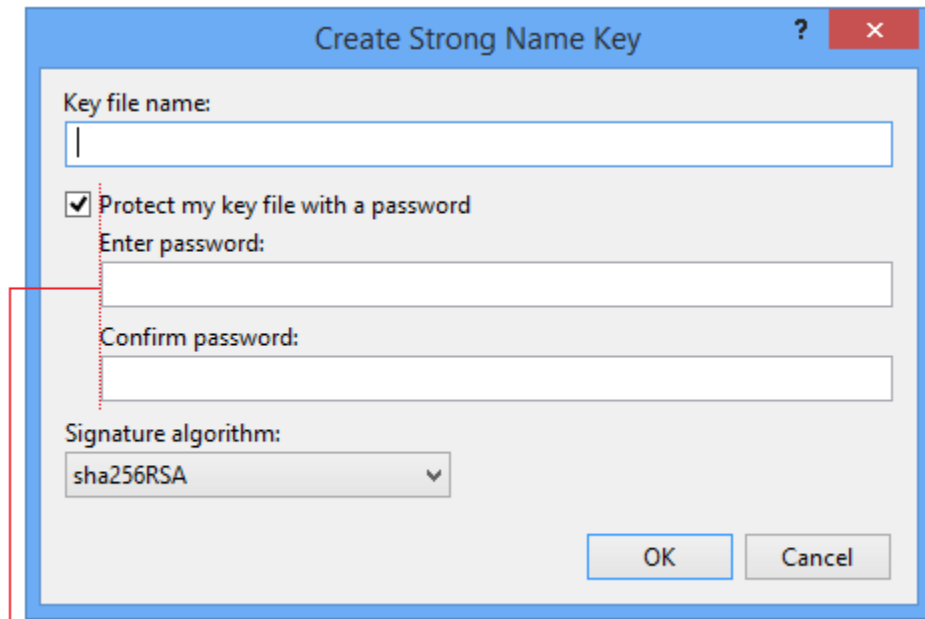
Alignment

- Invisible lines that run through the interface and “attract” the left- or right-edge of a widget control
 - Vertical
 - Horizontal

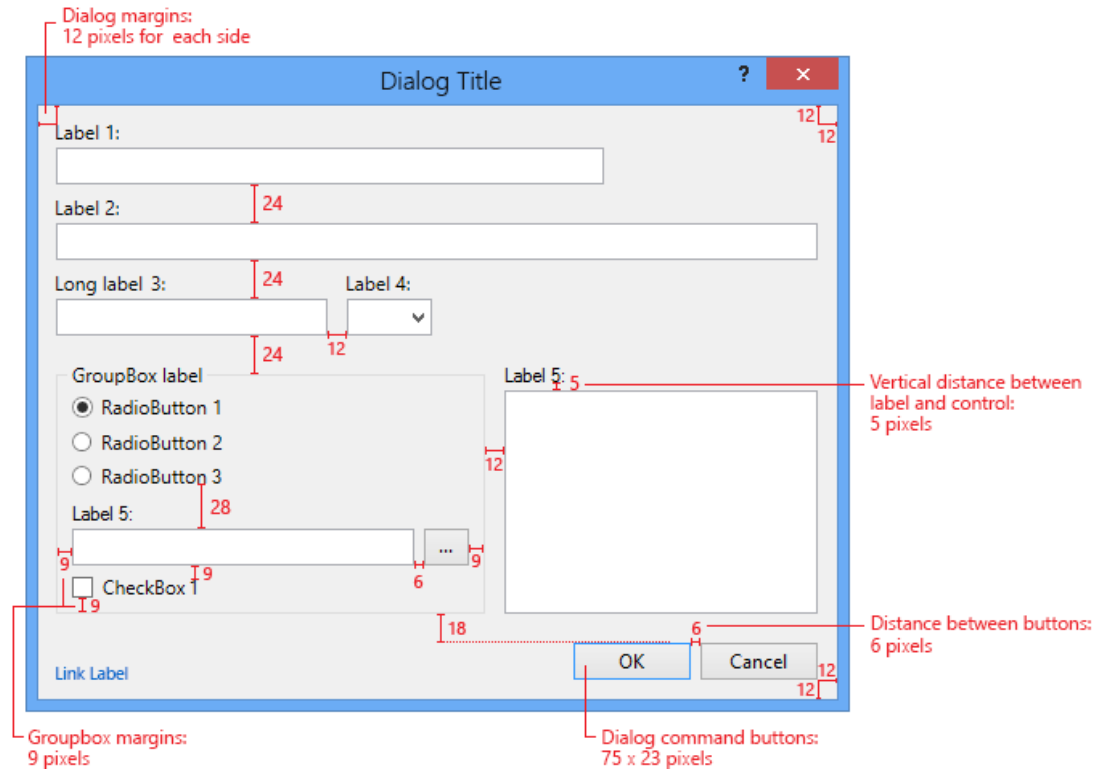
Example



Examples



Align labels of nested controls



<https://docs.microsoft.com/en-us/visualstudio/extensibility/ux-guidelines/layout-for-visual-studio?view=vs-2019>

Grid Layout Ingredients

- **Guides:** The edge which you choose to align content with
- **Column:** A vertical division of content
- **Row:** A horizontal division of content
- **Margins:** The area surrounding your content
- **Gutters:** The margins between columns
- **Hang-line:** A horizontal guide to align content to hang off of
- **Baseline:** The horizontal guide for an element to sit on top of
- **Rhythm:** Proportion systems that can help define the sizing frequency and spacing of each of the above elements.

Example: Bootstrap grid

Always 12 columns in total

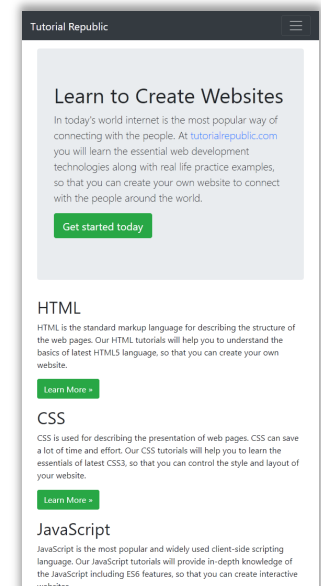
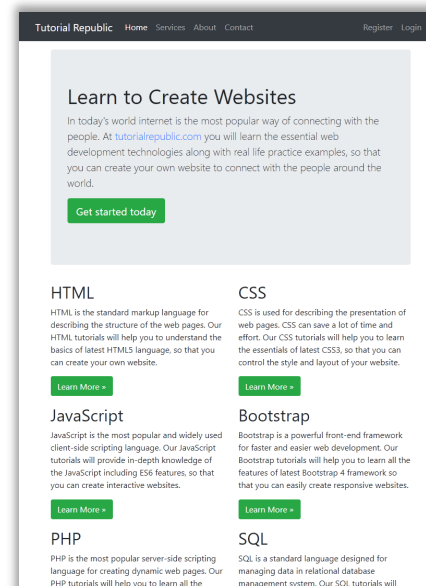
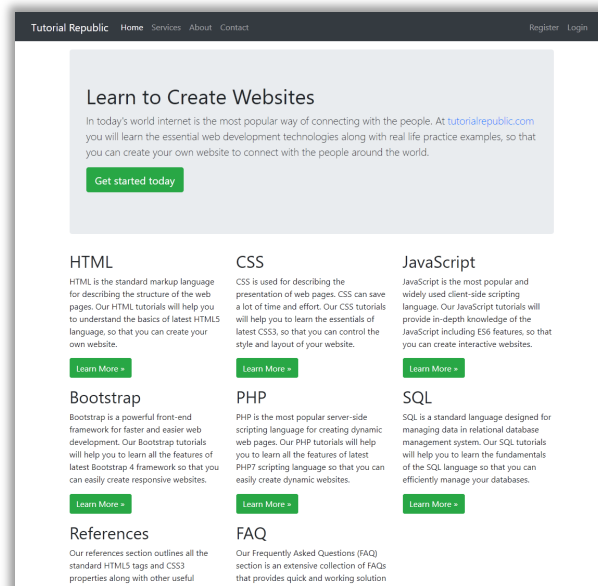
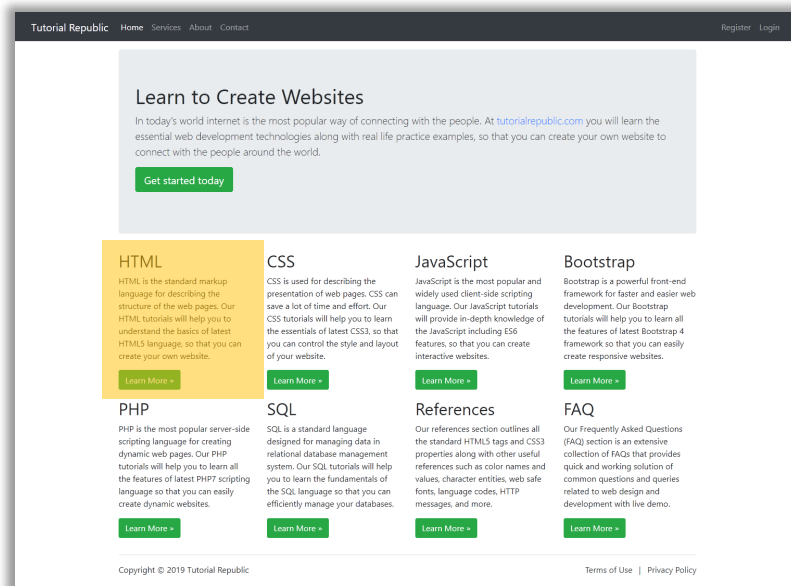
May choose to span a group of columns

Each column is tagged according to the screen size:

- xs (phones - <768px)
- sm (tablets - >=768px)
- md (small laptops - >=992px)
- lg (laptops and desktops - >1200px)

span 1	span 1	span 1	span 1	span 1	span 1	span 1	span 1	span 1	span 1	span 1	span 1
span 4				span 4				span 4			
span 4				span 8							
span 6						span 6					
span 12											

Responsive Grid Layout



```
<div class="row">
  <div class="col-md-6 col-lg-4 col-xl-3">
    <h2>HTML</h2>
    <p>...</p>
    <p><a href="..." class="btn btn-success">...</a></p>
  </div>
```

Grid Structure

Main body:
Mix of 2x and 3x
columns

Alternating row
types



Title area outside the
grid

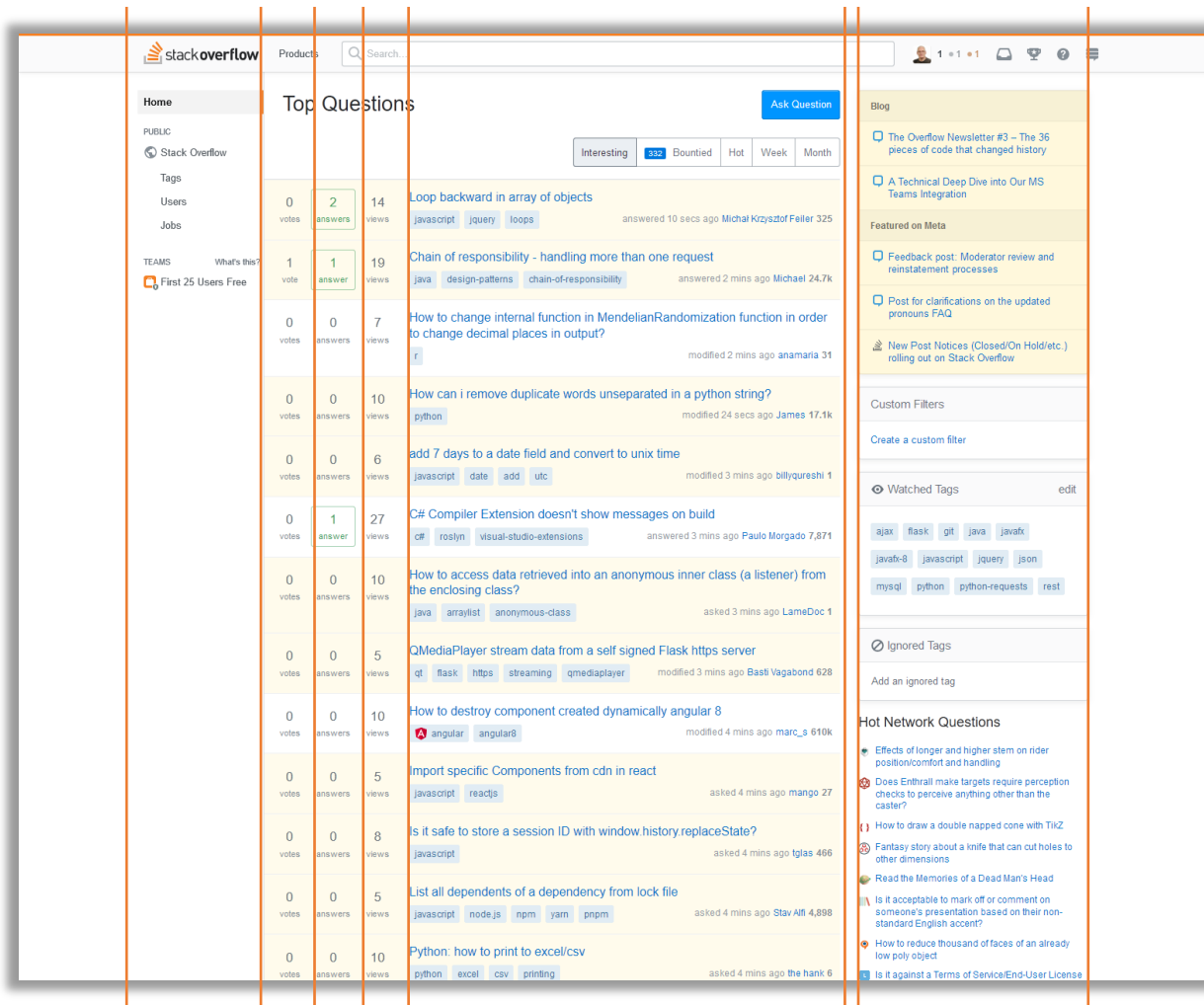
Right column for
other types of
articles

Grid Structure

Main content
(center, wide)

Navigation
(left, smaller)

Related content
(right, smaller)



Example (2019)

Software									
1° anno									
Periodo	Codice	Lingua	Insegnamento	Crediti	Docente	Note	Vincoli		
1	01PDW0V	🇮🇹	Information systems ING-INF/05 (6)	6	M. Morisio	⌵			
1	02GOLOV	🇮🇹	Architetture dei sistemi di elaborazione ING-INF/05 (10) Oppure	10	P. Bernardi E. Sanchez Sanchez	⌵			
1	02LSE0V	🇮🇹	Computer architectures ING-INF/05 (10)	10	P. Montuschi	⌵			
1	01SQJOV	🇮🇹	Data Science and Database Technology ING-INF/05 (8) Oppure	8	S. Chiusano	⌵			
1	01SQMOV	🇮🇹	Data Science e Tecnologie per le Basi di Dati ING-INF/05 (8)	8	E. Baralis	⌵			
1	010TW0V	🇮🇹	Computer network technologies and services ING-INF/05 (6) Oppure	6	M. Baldi	⌵			
1	02KPN0V	🇮🇹	Tecnologie e servizi di rete ING-INF/05 (6)	6	G. Marchetto	⌵			
2	02JEU0V	🇮🇹	Formal languages and compilers ING-INF/05 (6)	6	R. Sisto	⌵			
2	05BID0V	🇮🇹	Ingegneria del software ING-INF/05 (8) Oppure	8	G. Bruno	⌵			
2	04GSPOV	🇮🇹	Software engineering ING-INF/05 (8)	8	M. Morisio	⌵			
2	01UDFOV	🇮🇹	Applicazioni Web I ING-INF/05 (6) Oppure	6	E. Masala	⌵			
2	01TXYOV	🇮🇹	Web Applications I ING-INF/05 (6)	6	F. Corno	⌵			
2	02GRSOV	🇮🇹	Programmazione di sistema ING-INF/05 (10) Oppure	10	G. Cabodi	⌵			
2	01NYHOV	🇮🇹	System and device programming ING-INF/05 (10)	10	S. Quer	⌵			
2° anno									
Periodo	Codice	Lingua	Insegnamento	Crediti	Docente	Note	Vincoli		
1			Insegnamento a scelta 1	6					
1	01TYMOV	🇮🇹	Information systems security ING-INF/05 (6) Oppure	6		⌵			
1	01UDU0V	🇮🇹	Sicurezza dei sistemi informativi ING-INF/05 (6)	6		⌵			
1	01SQNOV	🇮🇹	Software Engineering II ING-INF/05 (6)	6		⌵			
1,2			Crediti liberi	6					
1,2	29EBHOV		Tesi	30					
2			Insegnamento a scelta 2	6					
Insegnamento a scelta 1									
Periodo	Codice	Lingua	Insegnamento	Crediti	Docente	Note	Vincoli		
1	01TYDOV	🇮🇹	Cloud Computing ING-INF/05 (6)	6		⌵			
1	01PDCOV	🇮🇹	Digital control technologies and architectures ING-INF/04 (6)	6		⌵			
1	01TXZOV	🇮🇹	Distributed systems programming ING-INF/05 (6)	6		⌵	Si		
1	01NWPOV	🇮🇹	Elaborazione dell'audio digitale ING-INF/05 (6)	6		⌵			
1	01UDGOV	🇮🇹	Energy management for IoT ING-INF/05 (6)	6		⌵	Si		
1	02JSKOV	🇮🇹	Human Computer Interaction ING-INF/05 (6)	6		★ ⌵			
1	01SQIOV	🇮🇹	Machine Learning and Artificial Intelligence ING-INF/05 (6)	6		⌵			
1	01PDXOV	🇮🇹	Modern design of control systems ING-INF/04 (6)	6		⌵			
1	01OUVOV	🇮🇹	Optimization methods and algorithms MAT/09 (6)	6		⌵			

Example (same page in 2020)

Software								
1° anno 2020/2021								
Periodo	Codice	SSD	Insegnamento	Lingua	Crediti	Docente	Note	Orario
1	01PDWVOV	ING-INF/05 (6)	Information systems	🇺🇸	6	M. Morisio (118 iscr.)	🟢	🕒
1	02GLOV	ING-INF/05 (10)	Architetture dei sistemi di elaborazione	🇮🇹	10	P. Bernardi (150 iscr.) E. Sanchez Sanchez (159 iscr.)	🟢 🟢	🕒
oppure								
1	02LSEOV	ING-INF/05 (10)	Computer architectures	🇺🇸	10	P. Montuschi (207 iscr.)	🟢 🟢	🕒
1	015QJOV	ING-INF/05 (8)	Data Science and Database Technology	🇺🇸	8	S. Chiusano (172 iscr.)	🟢 🟢	🕒
oppure								
1	015QMOV	ING-INF/05 (8)	Data Science e Tecnologie per le Basi di Dati	🇮🇹	8	E. Baralis (254 iscr.)	🟢 🟢	🕒
1	01OTWVOV	ING-INF/05 (6)	Computer network technologies and services	🇺🇸	6	G. Marchetto (161 iscr.)	🟢 🟢	🕒
oppure								
1	02KPNVOV	ING-INF/05 (6)	Tecnologie e servizi di rete	🇮🇹	6	G. Marchetto (253 iscr.)	🟢 🟢	🕒
2	02JEUOV	ING-INF/05 (6)	Formal languages and compilers	🇺🇸	6	R. Sisto (60 iscr.)	🟢 🟢	🕒
2	05BIDOV	ING-INF/05 (8)	Ingegneria del software	🇮🇹	8	G. Bruno (132 iscr.)	🟢 🟢	🕒
oppure								
2	04G5POV	ING-INF/05 (8)	Software engineering	🇺🇸	8	M. Morisio (202 iscr.)	🟢 🟢	🕒
2	01UDFOV	ING-INF/05 (6)	Applicazioni Web I	🇮🇹	6	E. Masala (91 iscr.) L. De Russis (57 iscr.)	🟢	🕒
oppure								
2	01TXYOV	ING-INF/05 (6)	Web Applications I	🇺🇸	6	F. Corno (185 iscr.)	🟢	🕒
2	02GRSOV	ING-INF/05 (10)	Programmazione di sistema	🇮🇹	10	G. Cabodi (100 iscr.) A. Savino (112 iscr.)	🟢 🟢	🕒
oppure								
2	01NYHOV	ING-INF/05 (10)	System and device programming	🇺🇸	10	S. Quer (108 iscr.)	🟢	🕒
2° anno 2021/2022								
Periodo	Codice	SSD	Insegnamento	Lingua	Crediti	Docente	Note	Orario
1			Insegnamento a scelta 1		6		🟢	
1	01TYMOV	ING-INF/05 (6)	Information systems security	🇺🇸	6		🟢	🕒
oppure								
1	01UDUOV	ING-INF/05 (6)	Sicurezza dei sistemi informativi	🇮🇹	6		🟢	🕒
1	015QNOV	ING-INF/05 (6)	Software Engineering II	🇺🇸	6		🟢	🕒
1,2			Crediti liberi		6		🟢	
1,2	29EBHOV		Tesi		30		🟢	
2			Insegnamento a scelta 2		6		🟢	

Example (2015 vs. 2019)

Add an address

Full Name:

Address Line 1:
Street address, P.O. box, company name, c/o

Address line 2:
Apartment, suite, unit, building, floor, etc.

City:

State/Province/Region:

ZIP:

Country:

Phone Number: [Learn more](#)

Optional Delivery Preferences [\(What's this?\)](#)

Weekend Delivery:

Security Access Code:
For buildings or gated communities

Save & Add Payment Method

Save & Continue

Il tuo account > I tuoi indirizzi > [Nuovo indirizzo](#)

Aggiungi un nuovo indirizzo

Oppure ritira i tuoi colli quando desideri, presso i nostri punti self-service. Per aggiungere un punto di ritiro o un Amazon Locker, clicca [qui](#).

Paese/Regione

Nome e cognome

Indirizzo

Città

Provincia

Codice postale

Numero di telefono

Può essere utilizzato per aiutare consegna

Aggiungi istruzioni di consegna
Consegna nel fine settimana

[Aggiungi indirizzo](#)

Some Best Practices

- When designing a template, start from the longest block of text
- Left-aligned text is (usually) faster to skim
- Alignment guides the eye and reduces clutter
 - Avoid slight misalignments
 - Patterns and deviations are “automatically” detected
 - Deviate from a pattern for strategic reasons
 - Use visual proximity and scale to convey semantic information

Colors

The most dangerous weapon in your toolset



LINGSCARS.com



Leader of the Pack - The UK's favorite car leasing website!

Contract hire cars from Ling Valentine. LINGSCARS is the UK's favourite car leasing website - On 2016 I leased over £85 million in cars!



I AM LING
YOU CAN TRUST ME

Menu

- Home
- Cars
- Vans
- Customers
- About Ling
- Fun stuff
- Free stuff
- Live staff

CARS
A-Z

↓



ABARTH

124 Spider
Convertible
595 Convertible
595 Hatchback
695 Convertible



ALFA ROMEO

Giulia Saloon
Giulietta
Stelvio Estate



AUDI

Stop

"Believe it or not, this Gateshead-based website, featuring Mrs Ling jiggling on her motorbike, is one of the biggest online drivers of car sales in Great Britain" **25th July 2017**

4 News

Leader of the Pack

"[Ling Valentine is] Britain's **BIGGEST** individual seller of new cars."

BREXIT RISK FREE! February 2017 **theguardian**

LING'S BREXIT BORIS PROMISE: If the UK leaves the EU with "no deal", tariffs may apply to EU built cars landing in the UK after Brexit day (31st Jan?). If this is the case with YOUR car, and IF the price increases due to tariffs, YOU will be able to cancel the car order at **NO COST** to you. **YOU can order a new car from me, with NO BREXIT RISK.** - Ling

MY BEST SELLING
CAR LEASING DEALS!

500 IDEAS!



Fiat 500

1.2 Pop 8v (69bhp) (4 seats)
Hatchback 3dr 1242cc Petrol
Manual (5 Speed)

RENT NEW
£127/mth
including VAT

3 year cheap car leasing

9+35

NICOLE...PAPA!



Renault Clio

0.9 TCE Iconic 12v (90bhp)
Hatchback 5dr 898cc Petrol Manual
(5 Speed)

RENT NEW
£152/mth
including VAT

3 year cheap car leasing

6+35

MEGA-HATCH!



Citroen C3

1.2 PureTech 12v (83bhp) Flair
Hatchback 5dr Manual 1199cc

RENT NEW
£157/mth
including VAT

2 year cheap car leasing

6+23

Car Leasing
Online Service
Response Times

Quote > Proposal > Order > Delivery

15 CUSTOMERS IN 'PROPOSAL'

Ling replies in... **0:03:07**

129 CUSTOMERS IN 'ORDER'

Ling replies **0:05:03**

1 DELIVERY TODAY

Ford Ka+
Arthur
ATTEBOROUGH, NR17

21 DELIVERIES IN LAST WEEK

Renault Captur
Cath
PONTEFRAC, WF81

Mercedes GLC Coupe
Bill
BEDLINGTON, NE22

BMW 2 Series Convert...
Pingu
DERBY, DE56

Nissan Qashqai
Arlene
GLASGOW, G11

Volvo XC60 Estate
Saif
MILTON KEYNES, MK8

Seat Leon
Ben
BARNSELY, S70

Skoda Kodiaq Estate
Hannah
HAY-ON-WYE, HR3

Renault Clio
Paul
MIDDLEBROUGH, TS7

Renault Clio
Paul
MIDDLEBROUGH, TS7

Seat Arona
Steve
LONDON, SE18

Seat Leon
Adam
HATFIELD, AL10

Audi A3 Sportback
Chris
WYMONDHAM, NR18

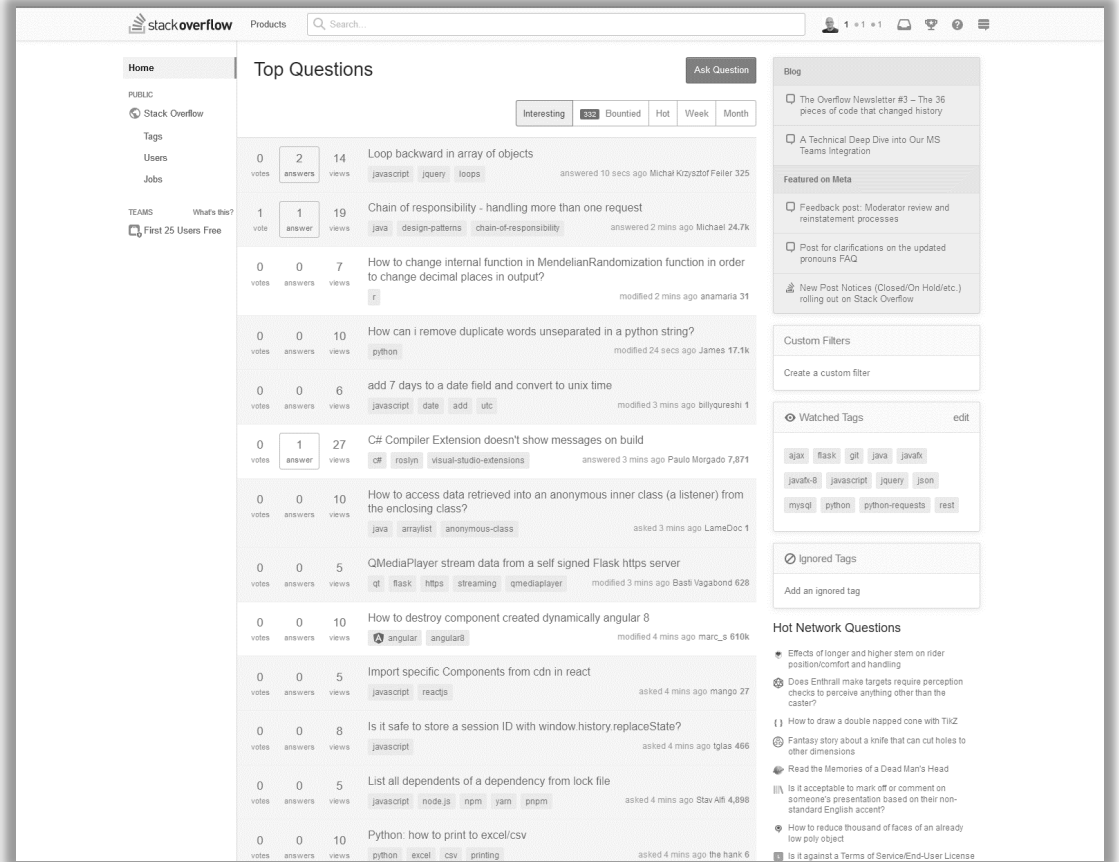
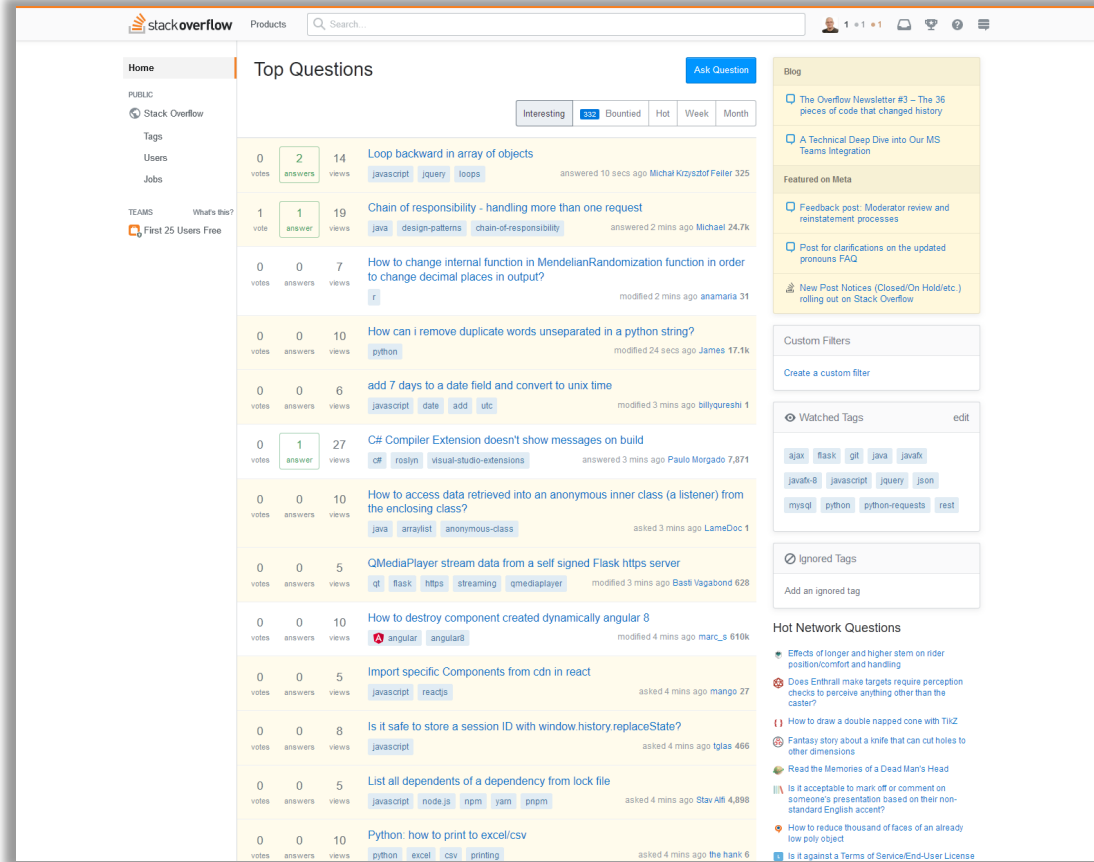
Colors

- A powerful tool to improve interfaces by communicating **key information**
- Inappropriate use of colors can severely **reduce the performance** of an interactive system

Colors: Suggestions

- Be careful, do not exaggerate
- Design in grayscale, first
 - Ensure information is conveyed by text and layout
- When adding colors, try to conserve the same luminance of the grayscale design
- Assign meaning to color
- Use a limited and consistent palette and use slight variations
- Avoid simultaneous display of pure (highly-saturated), spectrally extreme colors
 - e.g., no blue at the same time as red
 - desaturated combinations (pastels) are better

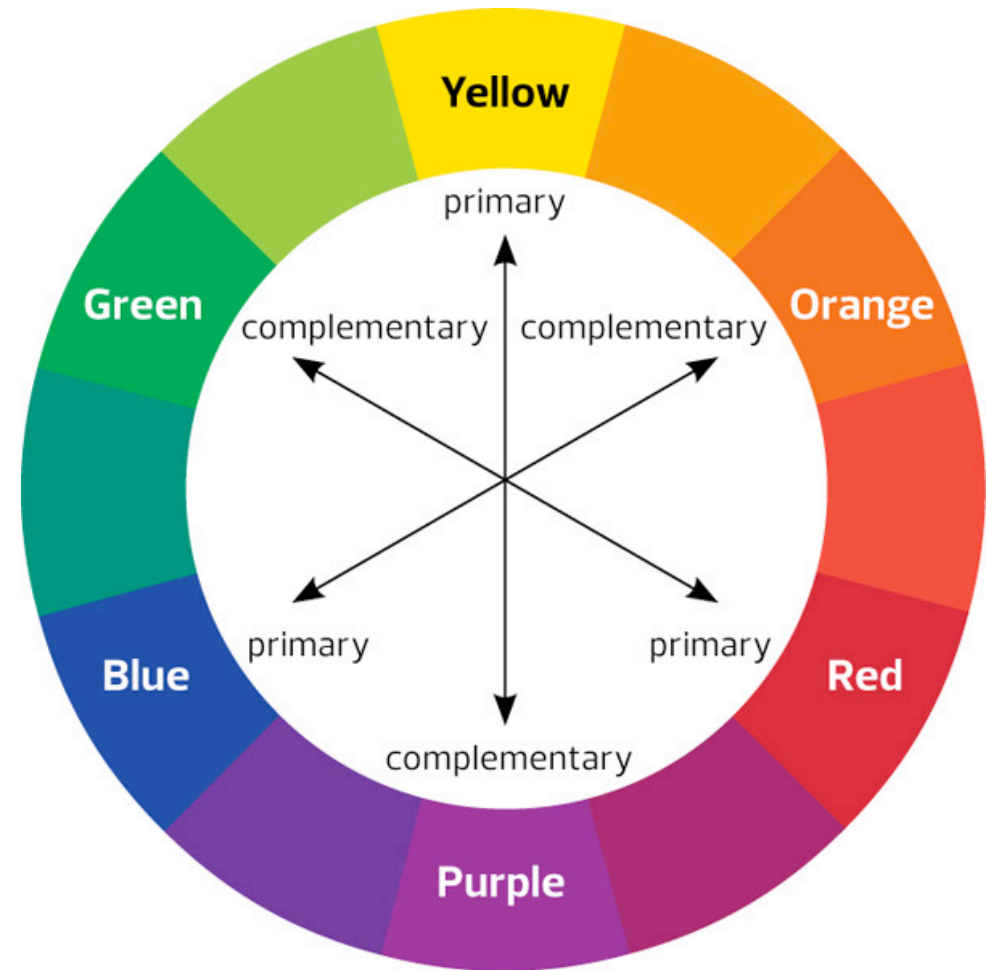
Example



The Color Wheel

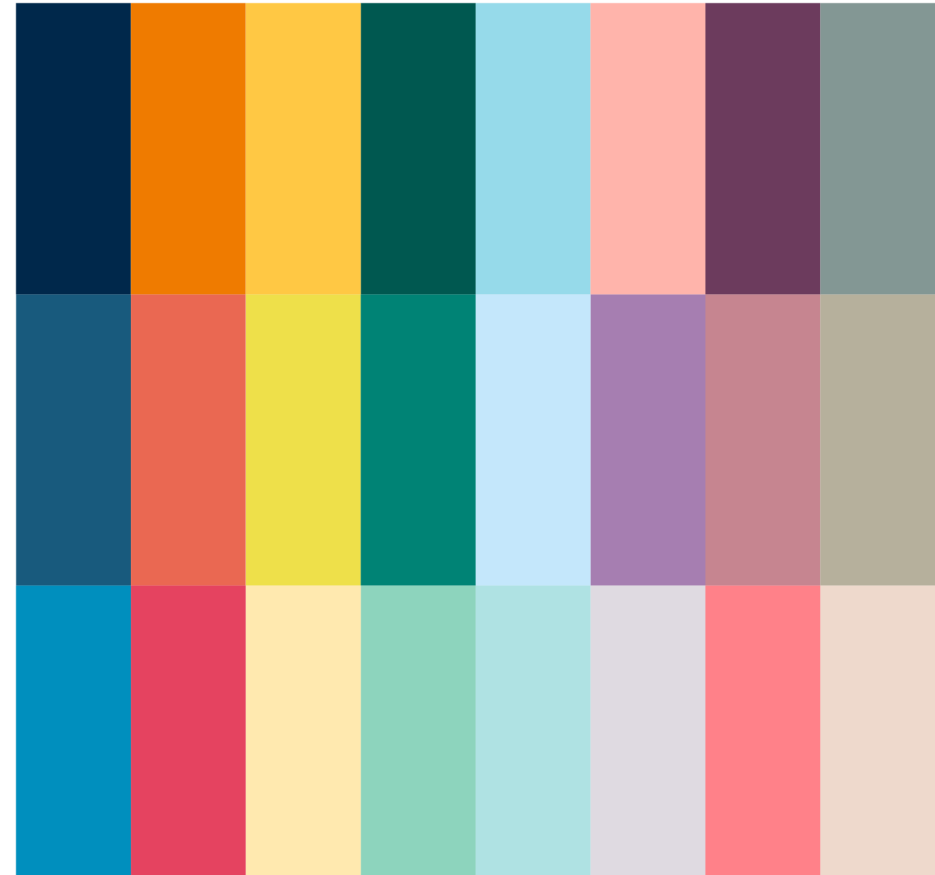
- Aka the Hue Circle
- Pick non-adjacent colors
- Opponent colors go well together
 - Complementary colors

- Read more at <https://www.canva.com/colors/color-wheel/>



Palettes - PoliTo

GERARCHIA COLORI



https://www.politocomunica.polito.it/en/corporate_image/brand_and_visual_identity

Palettes Generator

The screenshot shows the Coolors website's Palettes Generator interface. At the top left is the Coolors logo and a navigation menu with 'Tools', 'Jobs', 'Go Pro', 'Sign in', and a 'Sign up' button. Below the navigation is a prompt: 'Press the spacebar to generate color palettes!'. The main area displays a color palette with five vertical color swatches. Each swatch has a hex code and a name: Tufts Blue (3C91E6), Yellow Green (9FD356), Black Coffee (342E37), Baby Powder (FAFFFD), and Mango Tango (FA824C). A central vertical toolbar contains icons for close, zoom, grid, heart, swap, copy, and lock. An advertisement for Coolors is visible in the top right corner of the palette area.

Color Name	Hex Code
Tufts Blue	3C91E6
Yellow Green	9FD356
Black Coffee	342E37
Baby Powder	FAFFFD
Mango Tango	FA824C

<https://coolors.co>

ColourLovers



Share Your Color Ideas & Inspiration.

COLOURLovers is a creative community where people from around the world create and share colors, palettes and patterns, discuss the latest trends and explore colorful articles... All in the spirit of love.

Join the Community!

CONNECT WITH COLOURLOVERS

Follow @COLOURlovers 1.59M followers

LOVERS PEEK

- SadieSews on Vengeful 225**
Really nice look, with this! (:
- MistryMoments on CoffeeBerries**
I love your Template Design Style.. thanks
- renniecat on Cold Night**
Beautiful!
- GoldenHuesinBlue on Golden Fall**
Wow, very nice!
- TongrenGirl on Comfort**
Wow...so beautiful!!!!
- TongrenGirl on Extraordinary**
I love this!!!!
- TongrenGirl on Deep Waters**
Ooooo, fantastic colors!!!!
- TongrenGirl on Race to Spring**
Very nice!!!
- TongrenGirl on Race to Spring**
Thanks so much for coloring my

Navigation tabs: ALL, WEDDING, HOME, FASHION, WEB, PRINT, CRAFT, DIGITAL ART

LATEST BLOG POSTS [View More](#)

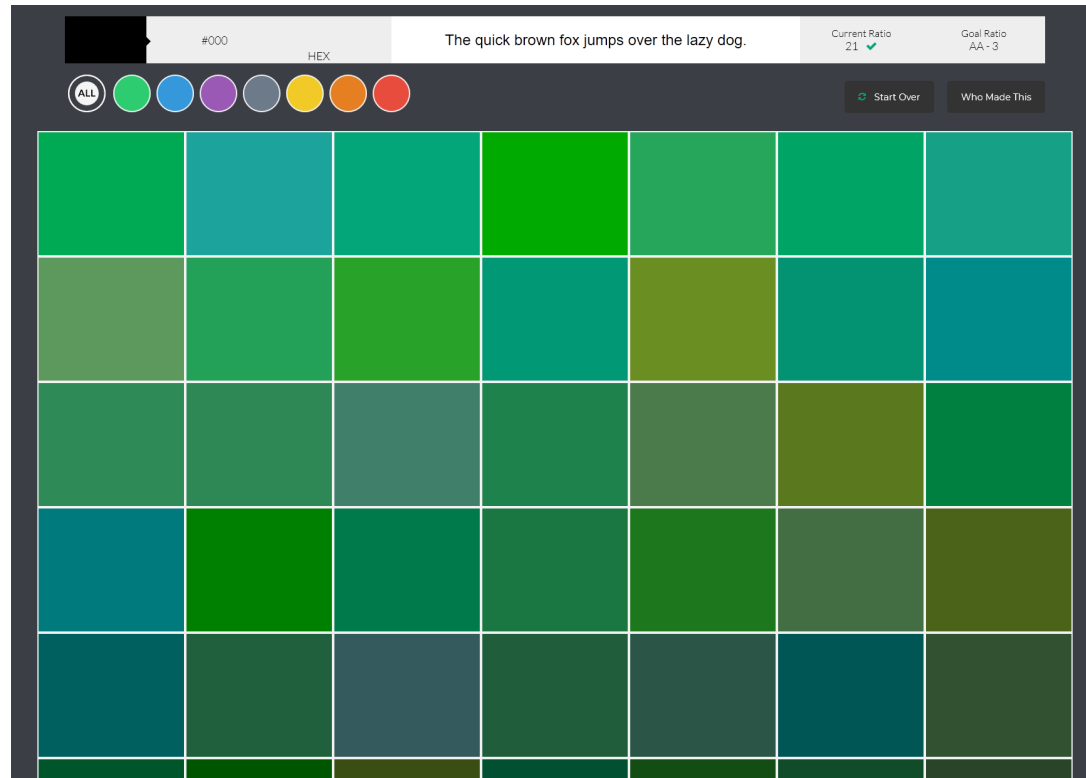
- Why Marketing Automation is Rocket-Fuel for Remote Workforce**
0 Comments
- How to Become a Full-Time Creative and Do What You Love**
0 Comments
- Colors, Human Growth Hormones, and Creativity**
0 Comments

PALETTES Create + PATTERNS Create + COLORS Create +

- Nineteen** by JGlia Freire 0
- try** by Anomalin 0
- light gray purple** by macover 0
- garden palette 2** by macover 0
- PodCasting** by Sisters 0
- slate purple** by macover 0

<https://www.colourlovers.com/>

Color Contrast



<http://coloursafe.co/>

Default type color On light			Default type color On dark		
Primary	#000000	1a	Primary	#FFFFFF	1a
Secondary	#000000	0.54a	Secondary	#FFFFFF	0.54a
Disabled	#000000	0.26a	Disabled	#FFFFFF	0.26a
Link	#3367D6	1a	Link	#7BAAF7	1a
Positive	#0B8043	1a	Positive	#57BB8A	1a
Negative	#C53929	1a	Negative	#E67C73	1a
Warning	#EA6100	1a	Warning	#F7CB4D	1a

Google Chrome Palette

Example

- Colors needing an explanation legend
- Time intervals are shaded with two different colors
 - “why is the first hour filled with a different color?”
- No indication of the “fill level”

Turni disponibili - Aule Studio - Sala studio al Secondo Piano di C.so Castelfidardo 39

Legenda turni prenotazione

Disponibile Passato Non prenotabile Prenotazioni non attive Turno al quale sei prenotato

Tutti gli orari sono da intendersi espressi secondo il fuso orario italiano

A partire da giorno 15 luglio 2020, è consentito l'uso della seguente Sala Studio della Sede Centrale:
- Sala studio al Secondo Piano di C.so Castelfidardo 39, codice locale TO_CIT11_XP02_001

Le sale studio sono aperte dalle ore 9.00 alle ore 18.00 dal lunedì al venerdì. L'accesso sarà consentito su due turnazioni orarie, dalle ore 9.00 alle 13.00 e dalle ore 14.00 alle ore 18.00

<< ⤴ Oggi ⤵ >> 21 Set 2020 - 27 Set 2020 1 giorno 3 giorni Settimana lavorativa **Settimana**

	Lunedì 21 Set 2020	Martedì 22 Set 2020	Mercoledì 23 Set 2020	Giovedì 24 Set 2020	Venerdì 25 Set 2020	Sabato 26 Set 2020	Domenica 27 Set 2020
09:00	09:00 - 13:00 - prenotazioni: 36/36	09:00 - 13:00 - prenotazioni: 36/36	09:00 - 13:00 - prenotazioni: 35/36	09:00 - 13:00 - prenotazioni: 36/36	09:00 - 13:00 - prenotazioni: 34/36		
10:00							
11:00							
12:00							
13:00							
14:00	14:00 - 18:00 - prenotazioni: 36/36	14:00 - 18:00 - prenotazioni: 36/36	14:00 - 18:00 - prenotazioni: 34/36	14:00 - 18:00 - prenotazioni: 34/36	14:00 - 18:00 - prenotazioni: 26/36		
15:00							
16:00							
17:00							

Reading and Navigating

«Informavores» must quickly find the information they need

Navigation

- Enables users to know where they are and to steer themselves to their intended destination
- Is about getting work done (or having fun) through a series of actions
- May consist of
 - **Task navigation**: successfully operating interactive applications, such as installing a mobile app, completing an on-line survey, or purchasing a ticket
 - **Web navigation**: finding information on a website or browsing social media
 - **Command menu navigation**: finding the action needed in a desktop application
- Has nothing to do with visual elegance / graphic shininess

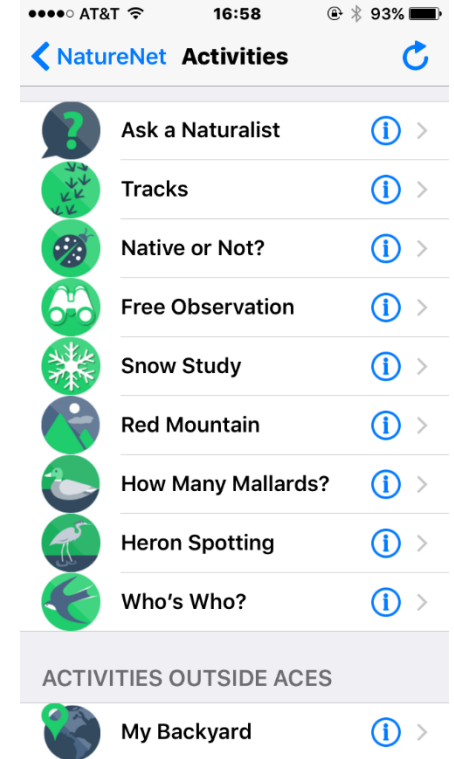
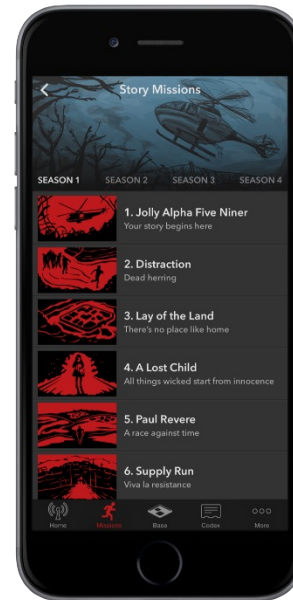
Navigation By Selection

- Menu bars, pop-up menus, toolbars, palettes and ribbons
- Shortcuts and gestures for rapid interaction
- Long lists
- Linear versus simultaneous presentation

For an extra \$5
you can add a gift wrap
selected from dozens of choices

Add gift wrap

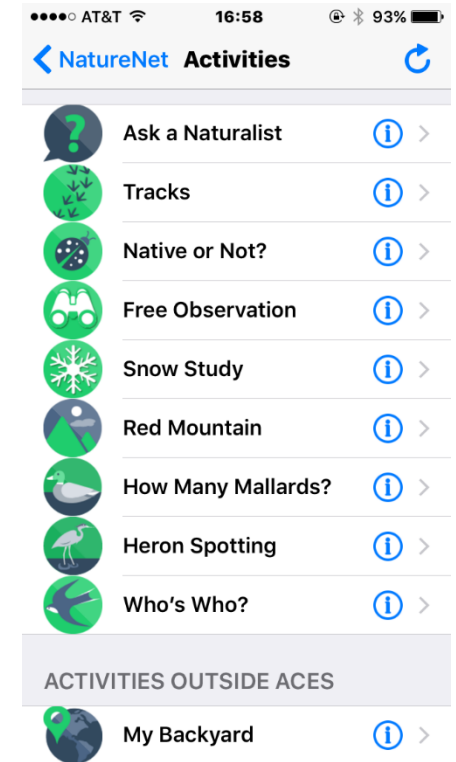
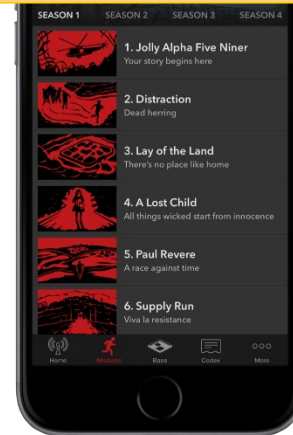
No thanks



Navigation By Selection

- Menu bars, pop-up menus, toolbars, palettes and ribbons
- **Shortcuts and gestures for rapid interaction**
- Long lists
- Linear versus simultaneous presentation

- Tap
- Long press
- Double tap
- Small swipe
- Large swipe
- Rapid swipe (fling)
- Pinch and spread
- 2-finger swipe
- ...



Navigation By Selection

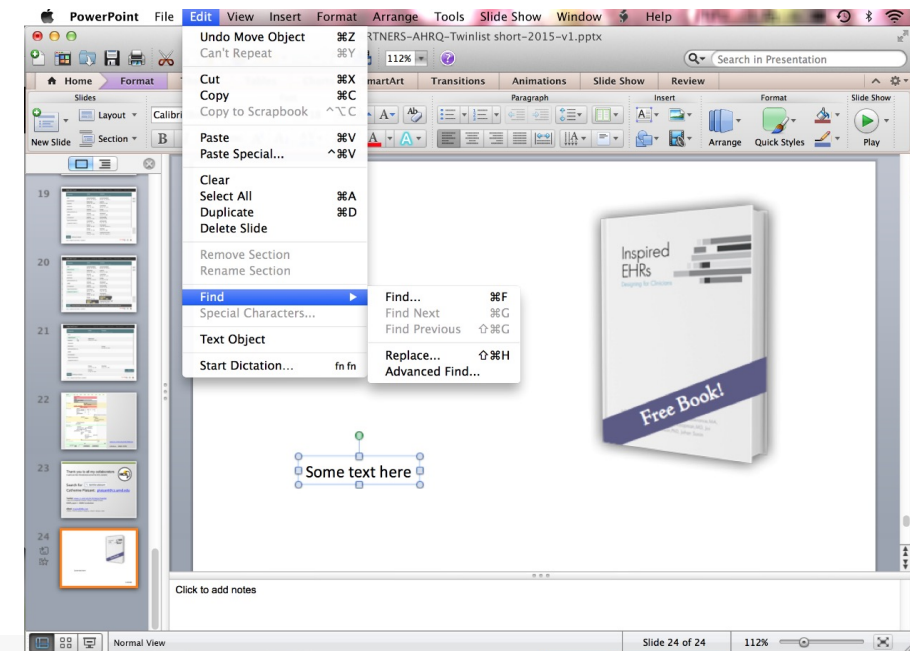
- Radio Buttons and Checkboxes
- Menu bars, pop-up menus, toolbars, palettes and ribbons

Does anyone in your household currently smoke?

- Yes, someone does
- No, no one does
- Not sure

What treatment would you like to discuss with a nurse?

- Surgery
- Physical therapy
- Medication
- Acupuncture (not available in your area)



Menus

The screenshot shows the NASA website homepage with a yellow navigation bar at the top. The navigation bar contains the following items: Missions, Galleries, NASA TV, Follow NASA, Downloads, About, NASA Audiences, and a search bar. Below the navigation bar, there are several content tiles. The main tile features a video of the International Space Station crew with the caption "One-Year Crew Halfway There". To the right, there is a video player for "The Martian" Director Ridley Scott Discusses NASA's Journey to Mars. Below the main tile, there are several smaller tiles: "Image of the Day" (Good Morning From the International Space Station), "Space Travel" (New Green Propellants Complete Milestones), "Fire and Smoke" (Rough Fire Still Burning in California), "The Real Martians" (Although the action in "The Martian" takes place 20 years in the future...), "Real Martian Videos" (with a tweet about 3D printed habitats), and "SDO Solar Mission" (SDO Catches an Earth-Moon Double Photobomb). At the bottom, there is a "MORE STORIES" link and the NASA logo with the text "National Aeronautics and Space Administration NASA Official: Brian Dunbar".

The screenshot shows the NASA TV website interface. At the top, there is a search bar and a menu icon. Below the navigation bar, there is a large video player showing the International Space Station crew. The video player has a caption "One-Year Crew Halfway There". Below the video player, there is another video player showing a group of people in a laboratory setting.

Content Organization

- Organizing menus in a meaningful structure results in faster selection time and higher user satisfaction
- Approaches:
 - Linear sequence (e.g., in a wizard or survey)
 - Hierarchical structure (tree) that is natural and comprehensible (e.g., a store split into departments)
 - Network structure when choices may be reachable by more than one path (e.g., websites)

Tree-like Content Organization

▼ Help | Wish List | Gift Registry | Classes & Events | Store Locator | Checkout

REI | Find great gear and clothing | Welcome to REI! | Log In or Register | FREE SHIPPING With \$50 minimum purchase.

SHOP REI | SHOP REI OUTLET | TRAVEL WITH REI | LEARN | BLOG | MEMBERSHIP | STEWARDSHIP

Camp & Hike | Climb | Cycle | Fitness | Run | Paddle | Snow | Travel | Men | Women | Kids | Footwear | More | Deals

- Bikes**
 - Mountain Bikes
 - Road Bikes
 - Hybrid Bikes
 - Kids' Bikes
- Bike Helmets**
 - Road Helmets
 - Mountain Bike Helmets
 - Kids Helmets
- Cycling Clothing**
 - Jerseys
 - Jackets
 - Shorts
 - Tights and Pants
 - Accessories
- Cycling Shoes**
 - Road Shoes
 - Mountain Bike Shoes
- Bike Accessories**
 - Computers
 - Lights
 - Locks
 - Pumps
 - Racks
 - Trailers
 - Trainers
 - Messengers/Backpacks
 - Panniers/Bike Bags
- Bike Components**
 - Brakes
 - Saddles/Seat Posts
 - Tires, Tubes and Wheels
 - Tools and Maintenance
 - Drivetrain Components
 - Pedals
 - Handlebars

Car Racks | Novara Cycling | Cycling Deals | All Cycling

Deals (31)

▼ Features

- Moisture wicking (27)
- Quick drying (26)
- Sun-protective fabric (22)
- Waterproof (15)
- Insulated (11)
- Earflaps (6)
- Made in USA (5)
- See 8 More

▼ Brand

Clear

- 686 (6)

REI Rainwall Rain Jacket - Girls' \$31.83 - \$64.50

REI Rainwall Rain Pants - Kids' \$49.50

REI Sahara Convertible Pants - Girls' \$44.50

ONLY AT REI

ONLY AT REI

ONLY AT REI

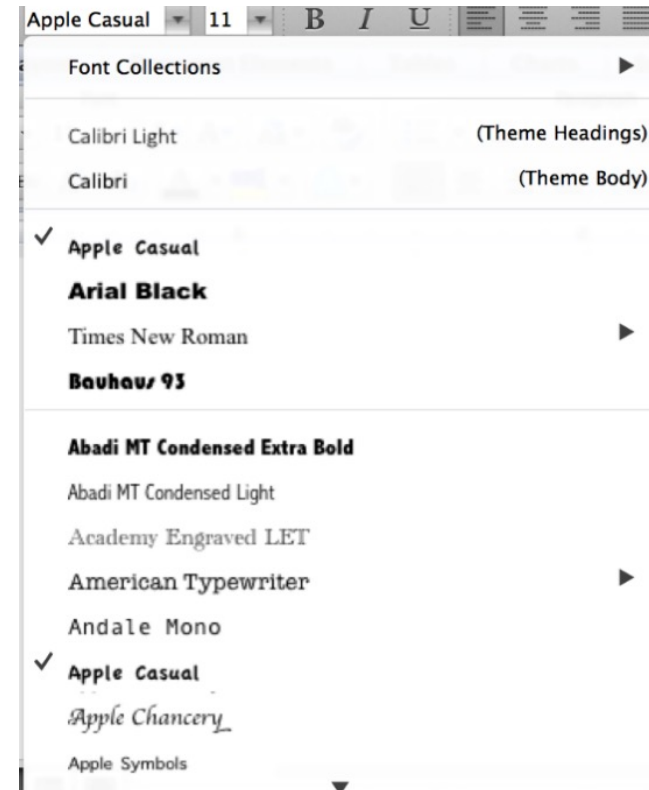
BUY NOW

Rules for Tree-like Organization

- Use **task semantics** to organize menus
- Limit the **number of levels** (i.e., prefer broad–shallow to narrow–deep)
- Create groups of **logically similar** items: e.g., Level 1: countries, Level 2: states, Level 3: cities
- Form groups that **cover all possibilities**: e.g., Age ranges: [0–9] [10–19] [20–29] and [\geq 30]
- Make sure that items are **non-overlapping**: e.g., use “Concerts” and “Sports.” over “Entertainment” and “Events”
- Arrange items in each branch by **natural sequence** (not alphabetically) or **group** related items
- Keep **ordering** of items **fixed** (or possibly duplicate frequent items in dedicated section of the menu)

Menu Grouping: example

- 3 groups
 - Template styles
 - Frequently used fonts
 - All fonts
- Alphabetical order within each group
 - Lack of a semantic ordering
- Preview for recognition
- Scrollable list



Icons

- Icons facilitate recognition over recall
 - When they are consistently used, and frequently visible
- Redundant coding helps recognition and memorization
 - Icon + Text + Tooltip + Context



Links

- Always use multi-word links
 - Download the [next assignment template](#)
 - Assignment template: click [here](#)
- Straight language, not jargon
 - [Scor-o-matic](#) download
 - Download the [spreadsheet for computing scores](#)

Forms

- Logical field grouping
 - Sections
 - Dividers
 - Columns (spacing)
 - Titles
- Real-time error checking and validation feedback
 - Suggestions for correction
- Explicit submit button

The screenshot displays a web form titled "Create an IEEE Account" with a help icon. The form is organized into several sections:

- Provide your personal information:** Contains three text input fields for "Given/First name" (filled with "Catherine"), "Middle name" (empty), and "Last/Family/Surname" (filled with "Plaisant").
- Enter e-mail address & password:** Contains four text input fields: "E-mail address" (filled with "cplaisant@" and highlighted in red), "Re-enter e-mail address" (empty), "Password" (filled with dots), and "Confirm password" (empty). A yellow warning box on the right states: "The e-mail address provided is not in a valid e-mail format (for example: j.doe@nomail.com). Please try again." A green success box below it says: "Your password is good. Passwords must be between 8 and 64 characters, and include at least one number. More..."
- Set security questions:** Contains two sets of dropdown menus for "Security question 1" and "Security question 2", each followed by a text input field for the answer.

At the bottom, there is a link for "Privacy & Opting Out of Cookies", a prominent orange "Create Account and Continue Joining" button, and a "Cancel" link.

References and Acknowledgment

- Scott MacKenzie: Human-Computer Interaction - An Empirical Research Perspective, Morgan Kaufmann
 - Chapter 3: Interaction Elements
- Ben Shneiderman, Catherine Plaisant, Maxine S. Cohen, Steven M. Jacobs, and Niklas Elmqvist, Designing the User Interface: Strategies for Effective Human-Computer Interaction
 - Chapter 8: Fluid Navigation
- COGS120/CSE170: Human-Computer Interaction Design, videos by Scott Klemmer,
https://www.youtube.com/playlist?list=PLLsT5z_DsK_nusHL_Mjt87THSTlgrsyJ
- Most of the slides are adapted from those used in the "Human Computer Interaction" course of Politecnico di Torino
 - <http://bit.ly/polito-hci>



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