



HELLO!

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@TheMatjaz

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Computer engineering student

Productivity

Psychology

Security

Privacy

Teaching

Databases

Open source

I **do** read the
Terms and
Conditions

Hacking

Blog

Linux & Unix

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EESTEC LC Trieste

- ▶ Electrical Engineering STudents European assoCiation.
- ▶ Also computer engineering students.

Like ELSA for tech nerds!

... or is ELSA like EESTEC for law nerds?

Computer engineering basics

the scary part made simple

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*“But I don’t know s**t
about computers!
Help!”*

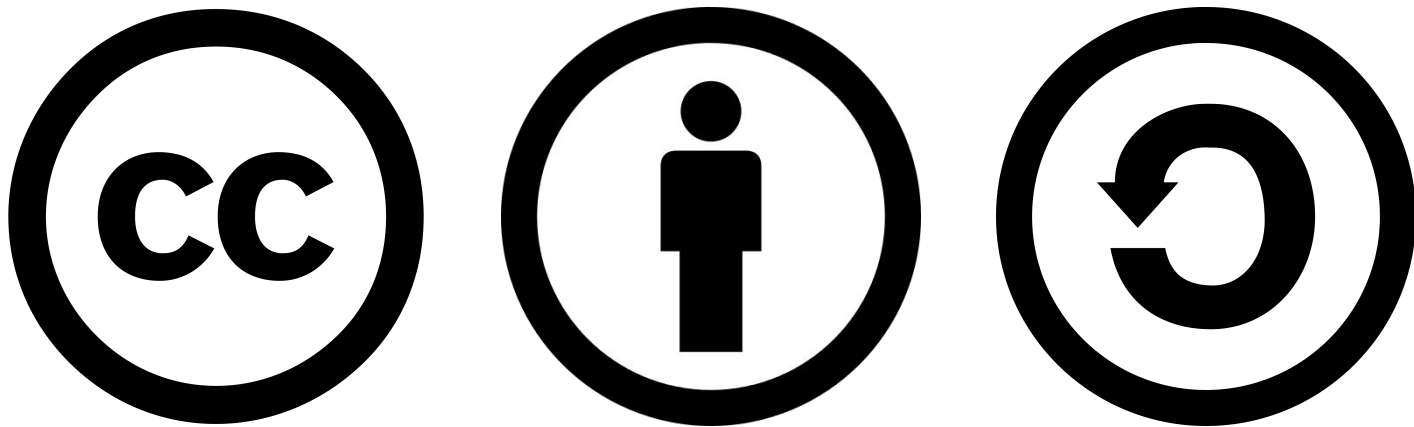
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We'll define

- ▶ Computers, Software, Hardware, Operating systems.
- ▶ How the Internet works.

Questions are welcome!

For real, ask me stuff.



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Slides available on matjaz.it/slides

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Computers and systems

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Computer

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Computer

- ▶ A device that **can be instructed** to perform some arithmetical and logical operations automatically.

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Hardware

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Hardware

- ▶ Physical electronic components of a computer.
- ▶ **Outside** the case:

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Hardware

- ▶ Physical electronic components of a computer.
- ▶ **Outside** the case: mouse, keyboard, screen, printer, USB ports
- ▶ **Inside** the case:

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Hardware

- ▶ Physical electronic components of a computer.
- ▶ **Outside** the case: mouse, keyboard, screen, printer, USB ports
- ▶ **Inside** the case: processor, memory, disk, network card, graphic card, sound card

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Software

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Software

- ▶ Set of machine-readable instructions that directs a computer's processor to perform specific operations.

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Software

- ▶ Set of machine-readable instructions that directs a computer's processor to perform specific operations.
- ▶ **It tells the computer what to do.**
- ▶ **Program** = one set of instructions
- ▶ Software = set of programs, usually

18 System

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System

- ▶ Interconnected components that behave as one.
- ▶ Creates output from input.

20 System

- ▶ Interconnected components that behave as one.
- ▶ Creates output from input.

... thanks for nothing!

21

System

- ▶ Interconnected components that behave as one.
- ▶ Creates output from input.

... thanks for nothing!

A system is anything we want to consider as one!

22 Operating Systems

- ▶ Do you know some?

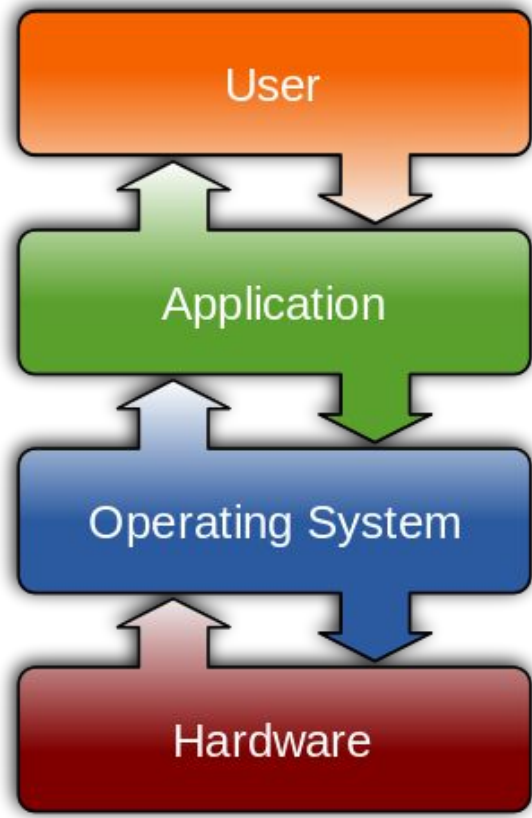
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Operating Systems

- ▶ Microsoft Windows
- ▶ GNU Linux
- ▶ OS X (macOS)
- ▶ BSD

- ▶ iOS
- ▶ Android

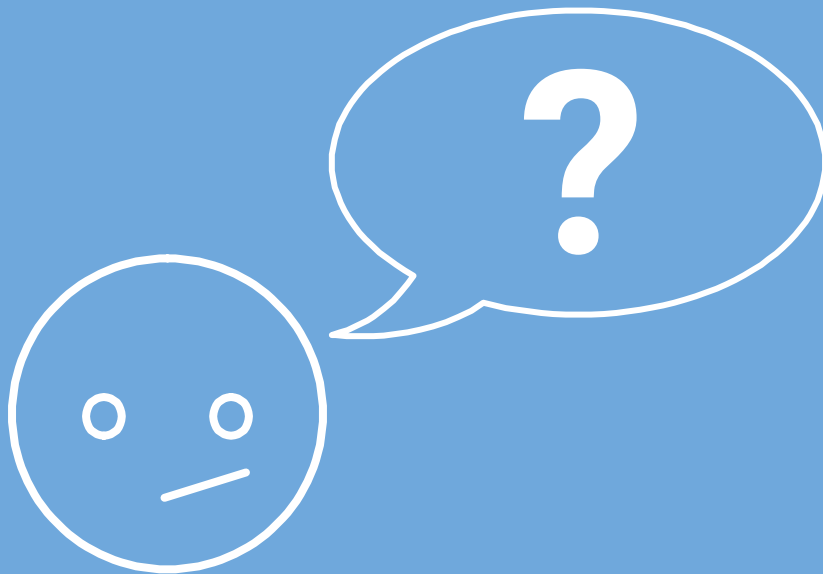
etc.



Operating system

- ▶ Software set that manages computer hardware and other software's resources.
- ▶ Provides common services for computer programs.
 - ▷ Examples: current time, network connections, windows and buttons
- ▶ **Kernel** = core of the OS.

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Networks and the Internet

27 Computer network

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Computer network

- ▶ A telecommunications network which allows computers to exchange data.

29 Internet

30 Internet

- ▶ Is the global system of interconnected computer networks.
- ▶ Is a *network of networks*.
- ▶ 2016: ~20 billion devices.
- ▶ 2020: ~50 billion (Cisco estimate).

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**4 TECH
SLIDES**

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ISP

- ▶ Internet Service Provider.
- ▶ The company that gives you access to the Internet (for money).
- ▶ Offers a telecommunication infrastructure and IP addresses.

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Finding a computer on the Internet somewhere

- ▶ Each computer on a network (and on the Internet) has an **IP address**.
- ▶ A unique (temporary) identifier.
- ▶ Just **like a phone number**.
- ▶ Examples:
 - ▷ *216.239.32.10*
 - ▷ *2001:0db8:0000:0000:0000:ff00:0042:8329*

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Domain Names

- ▶ We add names to computers.
- ▶ Easier to remember than IP addresses.
- ▶ The Domain Name Service (DNS) translates names to IP addresses.
- ▶ **Like a phone/address book.**
- ▶ *matjaz.it = 94.141.20.79*

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Server-Client

- ▶ A **server** is a computer **program** that provides functionality for other programs, called **clients**.
- ▶ Server and client may be on the same machine.
- ▶ Usually on different machines, connected using the Internet, they are *also called server and client*.

36 World Wide Web, “The Web”

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World Wide Web, “The Web”

- ▶ Set of documents and other resources.
- ▶ Identified by URLs (links).
- ▶ Interlinked by hypertext links.
- ▶ Can be accessed via the Internet

Whatever accessible by a **browser!**

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URL

- ▶ Uniform Resource Locator.
- ▶ Informally termed a **web address**.
- ▶ Is a reference to a web resource containing:
 - ▷ its **location** on a computer network
 - ▷ a **mechanism** for retrieving it

<https://www.example.com/image.jpg>

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Search engine

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Search engine

- ▶ Software designed to search for information on the World Wide Web.
- ▶ Compares the searched terms with the content of web pages.
- ▶ Does not answer any question directly, only proposes related content.

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Net Neutrality

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Net Neutrality

- ▶ Is the principle that ISP and governments should **treat all data on the Internet the same**
- ▶ No discrimination/limiting by
 - ▷ User
 - ▷ Content
 - ▷ Site
 - ▷ Application
 - ▷ Encryption

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Cookies

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Cookies

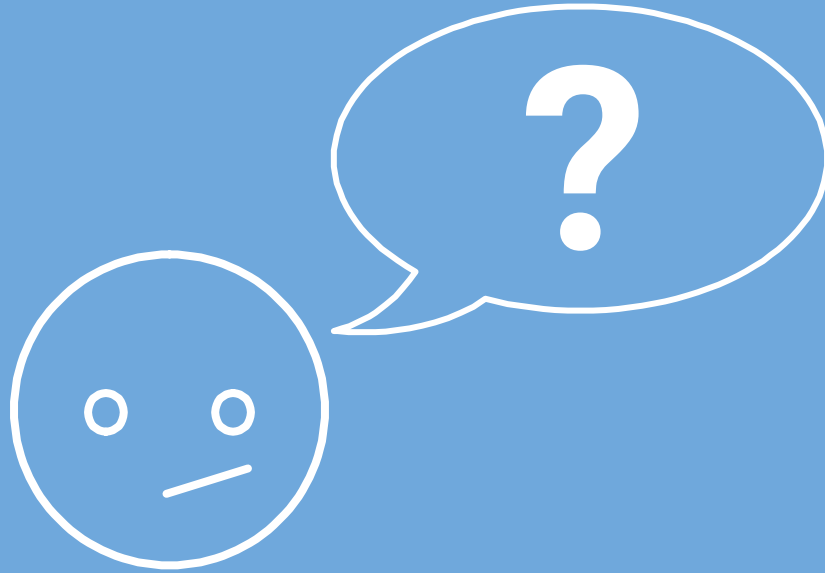
- ▶ A small piece of data sent from a website and stored in the user's web browser.
- ▶ For websites to remember the status of the user.
 - ▷ Authentication
 - ▷ Shopping cart
 - ▷ Purchase procedure steps

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Cookies

- ▶ **Needed for a website to work properly**, just like images or fonts.
- ▶ Tracking and advertisement cookies may be a **privacy issue**.
- ▶ Example:
 - ▷ Google Analytics has tracking cookies
 - ▷ Amazon has session cookies
 - ▷ *matjaz.it* has no cookies at all

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NOW YOU
TELL ME

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1. Wi-Fi
2. Open Source
3. SW Licenses
4. File Sharing
5. Peer to Peer
6. BitTorrent
7. Database
8. Hack/Crack
9. Viruses
10. Social Network
11. VPN
12. Proxy
13. Tor & Anonymity
14. Privacy
15. Tracking
16. Big Data
17. Internet of Things
18. Cloud Computing
19. Cloud Storage

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1. CDN
2. BIOS
3. IPv4, IPv6
4. USB
5. HDMI
6. HTTP(S)
7. TLS/SSL
8. GNU
9. CA
10. HTML
11. SaaS
12. IaaS
13. TCP/IP
14. UX
15. UI
16. LAN
17. PGP/GPG
18. WWW

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THANKS!

Contact me, maybe?



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Definitions based on Wikipedia's english pages with same names