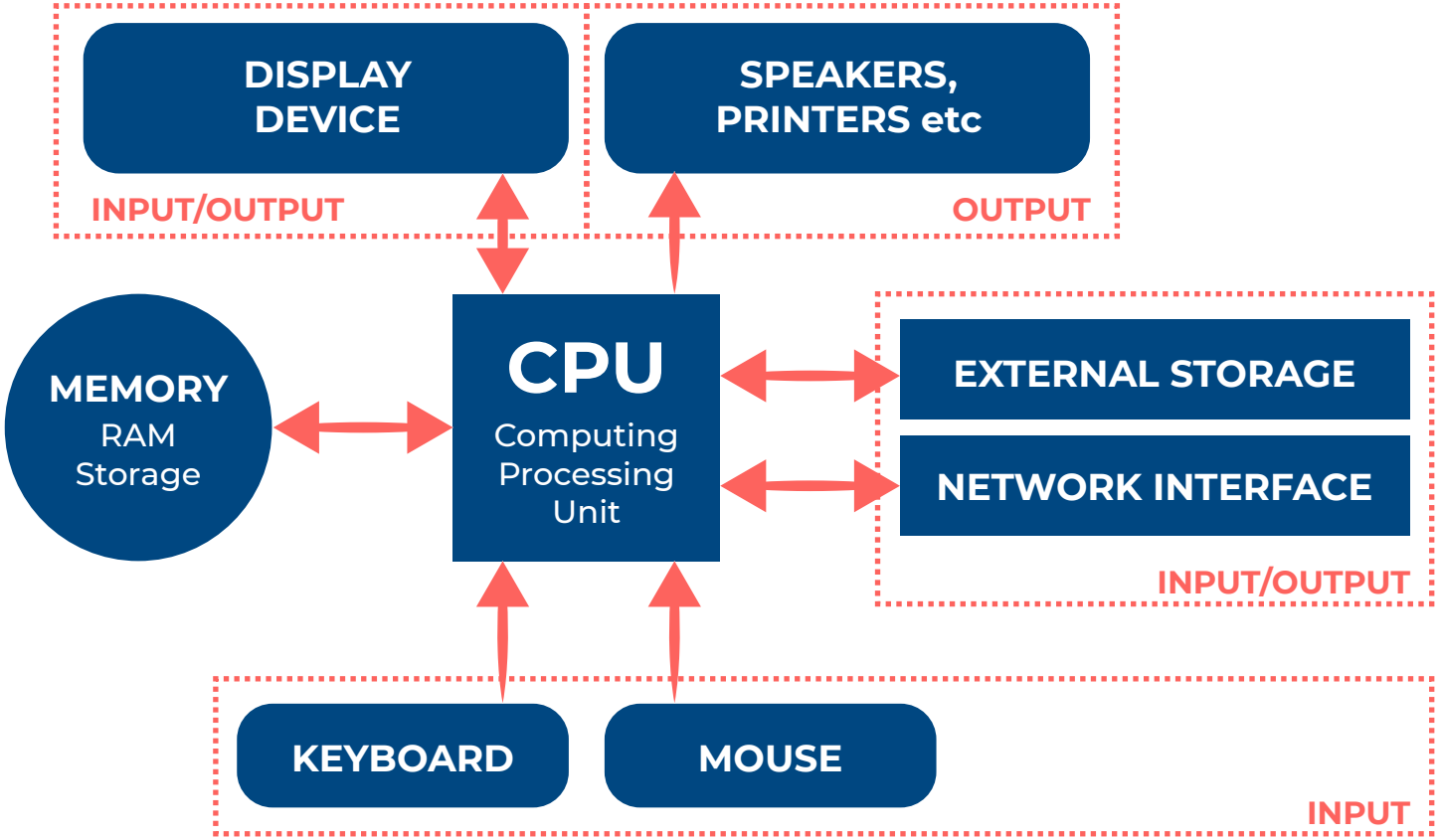
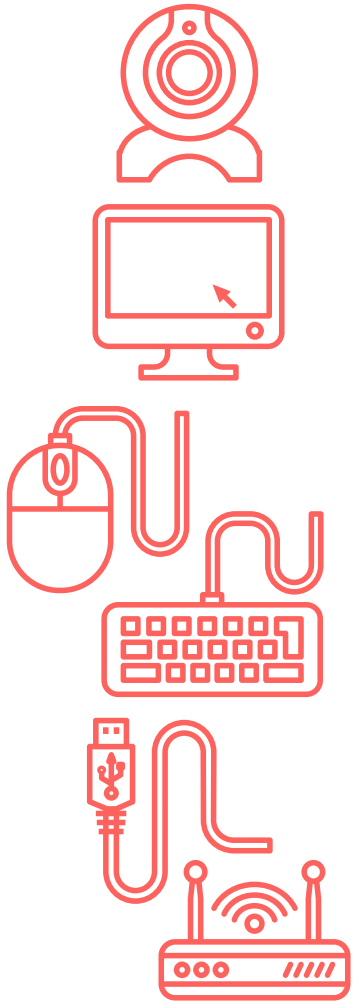
FIRST STEPS

ONLINE PROGRAMMING COURSE

PERSONAL COMPUTER DEVICES





INPUT DEVICES: keyboard, mouse, touchpad, webcamera, microphone etc

OUTPUT DEVICES: display, printer, speakers etc

NUMERAL SYSTEM — NOTATION

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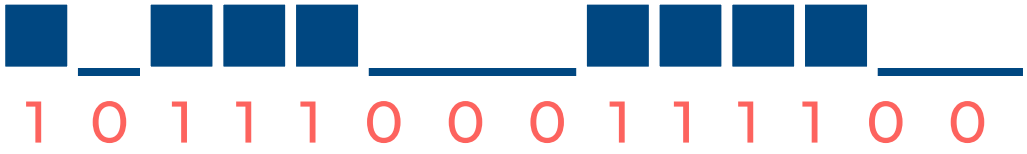
Possible characters in one position / digits

Computer binary presentation — yes/no



Human presentation:
Decimal (Hindu-Arabic):
zero - **0**, one - **1**, two - **2**, ... nine - **9**
Binary: 10111000111100

System	Base	Digits
Binary	2	0, 1
Decimal	10	0, 1, 2, 3, 4, 5, 6, 7, 8, 9

Dec	Bin
0	0
1	1
2	10
3	11
4	100
5	101
6	110
7	111
8	1000
9	1001
10	1010
11	1011
...	...
256	100000000

NUMERAL SYSTEM — CONVERSION

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Dec	Bin
0	0
1	1
2	10
3	11
4	100
5	101
6	110
7	111
8	1000
9	1001
10	1010
11	1011
…	…
256	100000000

Binary to Decimal Conversion

For binary number with n digits: $d_{n-1} \dots d_3\ d_2\ d_1\ d_0$

$$dec = d_0 \times 2^{n-1} + d_1 \times 2^{n-2} + \dots + d_{n-1} \times 2^0$$

Example

Find the decimal value of 111001_2:

binary number:	1	1	1	0	0	1
power of 2:	2^5	2^4	2^3	2^2	2^1	2^0

$$\underbrace{1\times2^5}_{32} + \underbrace{1\times2^4}_{16} + \underbrace{1\times2^3}_{8} + \underbrace{0\times2^2}_{0} + \underbrace{0\times2^1}_{0} + \underbrace{1\times2^0}_{1} = 57_{10}$$

$$111001_2 = 1\times2^5+1\times2^4+1\times2^3+0\times2^2+0\times2^1+1\times2^0 = 57_{10}$$

NUMERAL SYSTEM — CONVERSION

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Dec	Bin
0	0
1	1
2	10
3	11
4	100
5	101
6	110
7	111
8	1000
9	1001
10	1010
11	1011
...	...
256	100000000

Decimal to Binary Conversion

1. Divide the number by 2.
2. Get the integer quotient for the next iteration.
3. Get the remainder for the binary digit.
4. Repeat the steps until the quotient is equal to 0

Example

Convert $\mathbf{13}_{10}$ to binary:

Division by 2	Quotient	Remainder	Bit #
13/2	**6**	1	0
6/2	3	0	1
3/2	1	1	2
1/2	0	1	3

$\mathbf{13}_{10} = \mathbf{1101}_{2}$

UNITS OF INFORMATION

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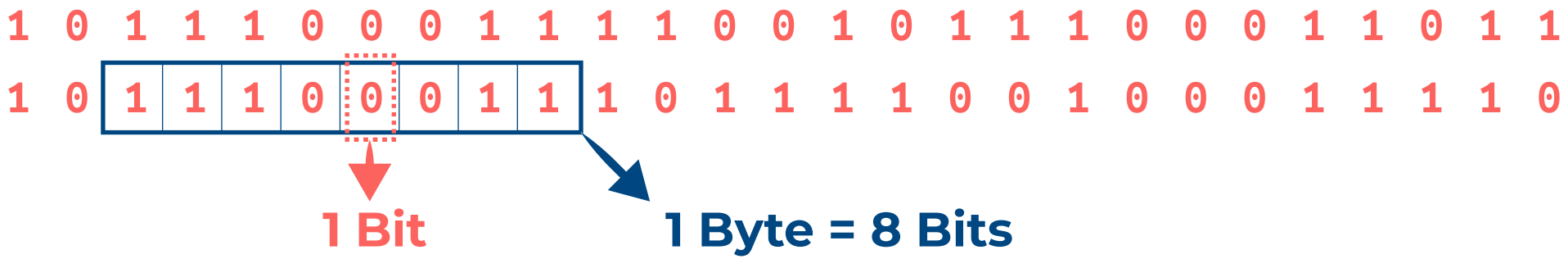
Minimal information unit is one bit with two possible values: 0 or 1



Byte is the smallest addressable unit of memory.

1024 bytes = 1 kilobyte (KB)
1024 kilobytes = 1 megabyte (MB)
1024 megabytes = 1 gigabyte (GB)
1024 gigabytes = 1 terabyte (TB)
1024 terabytes = 1 petabyte (PB)

Non-programmer says that there are 1000 bytes in one Kilobyte and programmer says that there are 1024 meters in one kilometer

RANDOM-ACCESS MEMORY (RAM)

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Address 0

10011011	10011011	10011011	00101110	00101110	00101111	00101101	11011011	01111000
10011011	10011011	10011011	00101110	00101110	00101111	00101101	11011011	01111000
10011011	10011011	10011011	00101110	00101110	00101111	00101101	11011011	01111000
10011011	10011011	10011011	00101110	00101110	00101111	00101101	11011011	01111000
10011011	10011011	10011011	00101110	00101110	00101111	00101101	11011011	01111000
10011011	10011011	10011011	00101110	00101110	00101111	00101101	11011011	01111000
10011011	10011011	10011011	00101110	00101110	00101111	00101101	11011011	01111000
10011011	10011011	10011011	00101110	00101110	00101111	00101101	11011011	01111000

Address 1073741824

THE “C” PROGRAMMING LANGUAGE

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Born in 1970th and it’s still relevant

The biggest advantage of C is that it is just as relevant today (in 2019-2020) as it was in the 1970s. C is probably the only programming language that has got through for so many years without significant changes to its original structure. Developed at Bell Labs by Dennis Ritchie.

C-style languages or C-family programming languages.



CLIENT–SERVER MODEL

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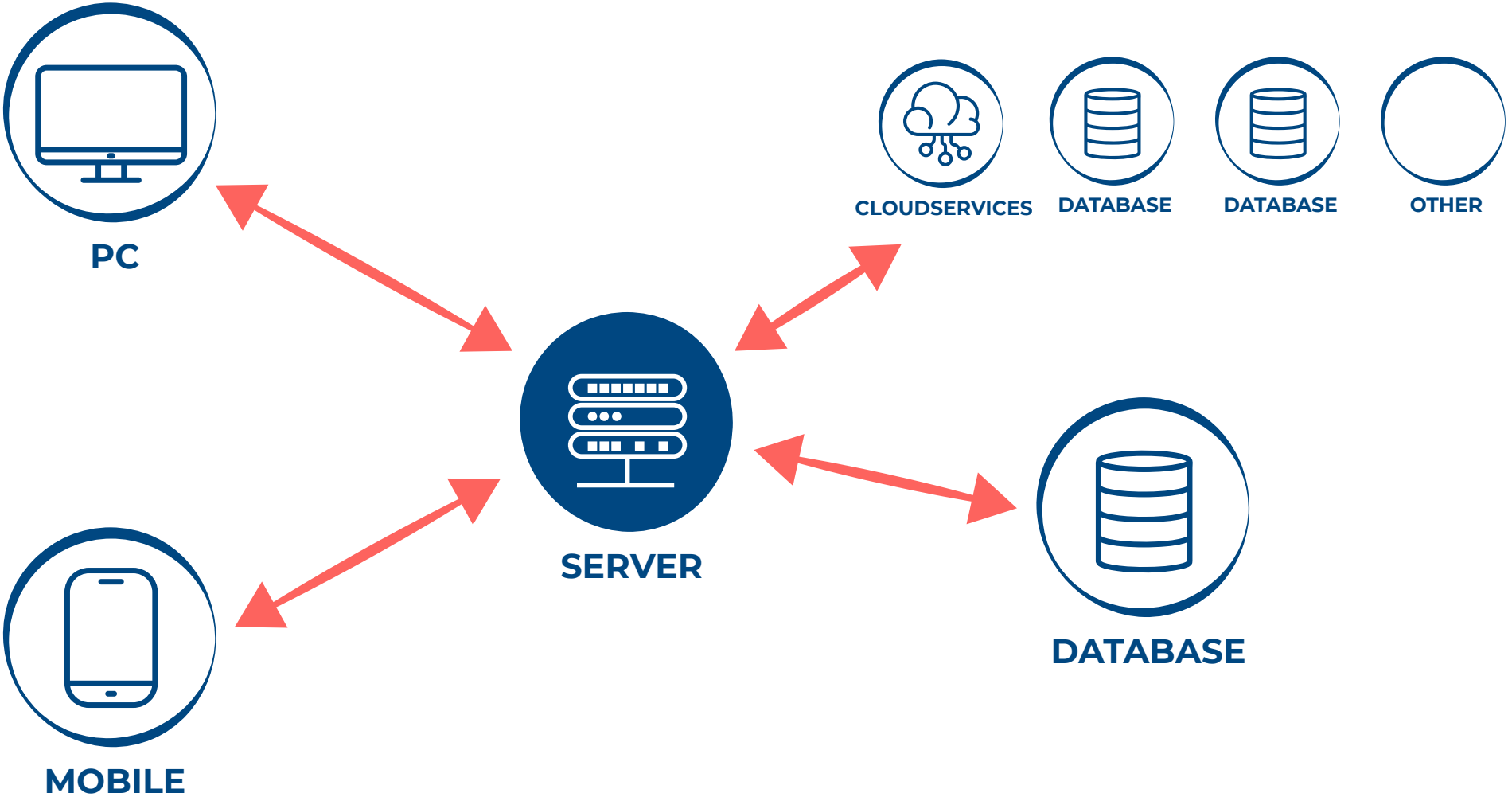

FRONT END & BACK END

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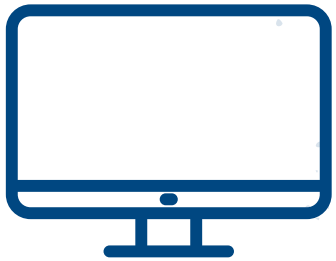
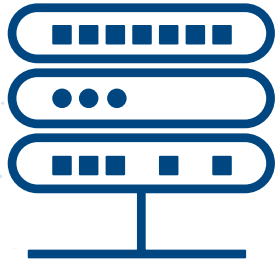


API

Application Programming Interface



FRONT END

BACK END

DATABASES

Technologies:

HTML, CSS
Javascript
Typescript
Angular
React
Vue.js
...
Mobile

FULL STACK DEVELOPER

Technologies:

Java
C#, Python
Node.js(JS)
PHP
Spring MVC
Express
Hibernate
...

Technologies:

MySQL
MongoDB
Oracle
...

QA MANUAL AND AUTOMATION

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QA MANUAL

Technologies and subjects:

Test management

Test cases

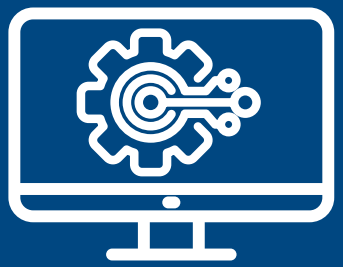
Bug tracking

Web Testing

Mobile testing

API testing

SQL



QA AUTOMATION

Technologies and subjects:

Java

TestNG

Selenium WebDriver

GitHub

Gradle

Appium

COMPILED, INTERPRETED AND JAVA

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