1. Answer the following questions:

   (a) When could one say that the first computer was invented?

   (b) What does integration mean?

   (c) What does the Moore's Law say? What about the Law nowadays?

   (d) What strategies do the main electronic companies take nowadays to get better performance?

2. Investigate how the quantum computer works.

3. True or false:

   (a) The computer was born thanks to Herman Hollerith since he established IBM. The first computer was created.

   (b) The main innovation in Electronics was the transistor.

   (c) The architectures are completely nowadays applied to the design of the computers.

   (d) Nowadays, CISC architectures are mostly used in CPUs.

   (e) The bus speed is measured by the number of operations which are performed in a time of unit.

   (f) The machine code is formed by a number of binary code and each one represents an instruction.

   (g) The size of a computer's data bus points out the number of bit which i sable to manipulate. For that reason, that bus is used to measure the power of a computer, and it is possible to talk about 16, 32 and 64 bits.

   (h) The CPUs with an AX register makes harder the instruction codification design.

4. Fill the following tables with the steps of the instructions and say how the instructions would be developed:

(a) MOVE BX, AX

Fetch the instruction	
Decode the instruction	
Execute the instruction	
Store	

(b) MOVE BX, 10_8

Fetch the instruction	
Decode the instruction	
Execute the instruction	
Store	

(c) SUB 10_8

Fetch the instruction	
Decode the instruction	
Execute the instruction	
Store	

5. We have a CPU with the following set of instructions:

- Data transfer (instruction MOVE):

00 Destination Source

000	Value	100	CX register
001	Absolute address	101	DX register
010	AX register	110	EX register
011	BX register	111	FX register

In that instruction, if the source points out any value, that value will be read in the following instruction.

- Arithmetic and Logical instructions:

01 Operation Source

000	ADD	100	AND
001	SUB	101	OR
010	MUL	110	NOT
011	DIV	111	XOR

Source will be coded with the table of the data transfer.

- Flow control instructions:

10 Kind of Jump 000

000	JZ (jump if the result of last operation was Zero)	100	JC (jump if the result of the last operation activated the carry bit)
001	JNZ (jump if the result of the last operation wasn't Zero)	101	JNC (jump if the result of the last operation didn't activate the carry bit)
010	JS (jump if the result of the last operation was a negative number)		
011	JNS (jump if the result of the last operation wasn't a negative number)		

The last instruction need to check the Status register in order to see if the last arithmetical / logical operation activated some bit of them. And with the condition, the program will jump to the address pointed out in the following instruction.

The program executed in our CPU is:

Address	Instruction
00 000 000	00 100 000
00 000 001	00 000 001
00 000 010	00 010 100
00 000 011	01 010 101
00 000 100	00 100 010
00 000 101	00 010 011
00 000 110	01 001 000
00 000 111	00 000 001
00 001 000	00 011 010
00 001 001	10 001 000
00 001 010	00 000 010

Do:

(a) Decode the instructions of the last code and write the instructions of each address.

(b) Try to understand the program and say what kind of mathematical function does it carry out?

6. Try to find 2 samples of CISC CPUs and 2 samples of RISC CPUs. Share it in the forum and discuss them with your classmates.