If the first bit of a floating point value in binary is 1, the value is:

- •Lower than 255
- •Greater than 255
- •**Negative**
- •Positive

•ARM processors use what type of architectures ?

- •ARM
- •**RISC**
- •GPU
- •CISC

•How does a branch predictor improve the results?

- •**By using pipeline**
- •By using cache memory
- •By transferring more data
- •By performing the same operation more frequently

•What are theoretical elements of a Turing machine:

- •LOAD, STORE, PUSH, PULL
- •A memory, a control unit and an arithmetic unit
- •**An infinite tape, a reading/writing tape, a table of instruction**
- •A list of states, with for each state an entry action and an exit action

•The 3 parts that compose a float in binary are the sign, the exponent and :

- •**The mantissa**
- •The sum
- •The opcode
- •The comma

•Intel processors use what type of architectures ?

- •ARM
- •RISC
- •GPU
- •**CISC**

•DRAM strores the information in :

- •Capacitors
- •Wires
- •Resistors
- •**Transistors**

•What method is used to represent signed integers in binary on modern computers ?

- •One's complement

- •Flip Bits
- •Divide and conquer
- •**Two's complement**

•What are the basics operations in boolean logic ?

- •0 and 1
- •**AND, OR, NOT**
- •ADD, SUB, MUL
- •LOAD, STORE

•At what point does a branch predictor predict branches ?

- •Tea time
- •Link Time
- •Compile time
- •**Runtime**

•What type of architecture is composed of an ALU, a control unit and a memory ?

- •Turing machine
- •Gothic
- •**Vom Neumann**
- •Finite state machine

•According to Flynn's taxonomy, in which classification is a multi-core processor ?

- •SISD
- •**MIMD**
- •SIMD
- •MISD

•Compared to the main memory, cache memory is :

- •Bigger and faster
- •**Faster and smaller**
- •Smaller and slower
- •Bigger and slower

•The algebra domain using only binary values was introduced by :

- •**George boole**
- •Charles Babbage
- •Edsger Dijkstra
- •Alan Turing

•What instruction use different parts of modern CPU

- •LOAD/ADD
- •**LOAD/STORE**
- •ADD/SUB
- •ADD/AND

•What type of RAM is generally used for the main memory ?

- ROM
- **DRAM**
- SRAM
- EPROM

•What type of RAM is generally used for the cache memory ?

- ROM
- DRAM
- **SRAM**
- EPROM

•What is an advantage of DRAM over SRAM ?

- **It’s cheaper**
- It’s faster
- Better bandwidth
- Lower latency

•What is an advantage of RISC over CISC ?

- Optimizes the number of instructions per program
- Widely available for personal computers
- Has a larger range of instructions
- **Faster instructions**

•In which type of notation are floating point values represented in binary ?

- Two’s complements
- Classic notation
- HTML
- **Scientific notation**

•According to Amdahl’s law, how much faster a program can go if we improve 50% of it ?

- **2 times**
- 0.25
- 0.5
- 4 times

•What are the basic steps to perform an instruction ?

- Perform and print
- Add, transfert and save
- Loop, execute, and jump
- **Fetch, decode and execute**

•Where is the cache memory generally integrated ?

- **Into the CPU**
- In the BUS
- Into the RAM memory
- In the BIOS

•What design allows a CPU to start ab instructions before the end of the previous ?

- •Caches
- •TLB
- •**Pipelining**
- •ALU

•How does a CPU achieve high performance parallelism ?

- •By having a hight frequency than CPUs
- •By using cache memory
- •By having a lot of simple cores performing the same operation at the same time
- •**By having an extended set of instructions**

•Which law states that the density of transistors doubles every 18 months ?

- •Amdahl’s law
- •Murphy’s law
- •Bell’s law
- •**Moore’s law**

•What does the program counter register contain?

- •**The address of the next instruction**
- •The number of programs
- •The number of cycles
- •The return address

•Dependencies between instructions can create something in a pipeline, what is it ?

- •Holes
- •**Bubbies**
- •Segmentation faults
- •Core dump

•How does a program take advantage of the cache memory ?

- •By doing memory
- •**By reusing data**
- •By unrolling loops
- •By spacing data in the memory

•What do we use translate code from a high-level programming language to assembly?

- •An IDE
- •A Hex editor
- •**A compiler**
- •A parser

•Circuit used to store one bit can be built with:

- •3 XOR gates
- •**2 NOR gates**
- •1 AND gate
- •2 AND gates

•On out of order processors, instructions are scheduled:

- •Statically
- •First in, first out
- •**Dynamically**
- •Round robin

•What is assembly language ?

- •A list of bits
- •A hight level programming language
- •**A symbolic representation of machine instructions**
- •An object oriented programming language

•In perfect condition, hardware pipelining achieves?

- •1 instructions every 2 cycles
- •**1 instructions per cycles**
- •2 instructions per cycles
- •Over 9000 instructions per cycle

•In a Von Neumann architecture, what is contained in the memory ?

- •Instructions
- •**DATA and instructions**
- •Cache
- •DATA

•How many transistor are required to build an AND gate ?

- •1
- •**2**
- •3
- •4

•(0,0) = 0, (0,1) = 1, (1,0) = 1, (1,1) = 0 is the truth table of :

- •AND
- •NOT
- •**XOR**
- •OR