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- **Instruction Set Types**
  ### A. What is CISC?
  Short for Complex Instruction Set Computing which contains the set of computer instructions. Was invented to compute complex instruction in the most efficient way.

  ### B. What are two examples of CISC Instruction Sets?
  Motorola 68000 family and Intel x86.

  ### C. What is RISC?
  Short for Reduced Instruction Set Computing which also contains set of computer instructions, but this one was invented in order to a small instruction could compute the complex ones more efficiently.

  ### D. What are two examples of RISC Instruction Sets?
  Alpha and ARC.

  ### E. CISC vs. RISC comparison (advantages of one and the other)

	CISC	RISC
Average clock cycle per instruction	In range of 2 and 15.	1.5
Performance optimized with more focus on …	hardware	software
Register Set	Only one	Multiple
Pipelined	Nor or less	Highly
Execution time	Very high	Very less
Decoding	Complex	Simple
External memory for calculations	Required	Not Required

Computer Architectures
  ### F. What is the Von Neumann architecture?
  Is an architecture based on the stored-program computer, where the instruction data and the program data are stored in the same memory.

  ### G. Advantages of the Von Neumann architecture
  Control Unit retrieves data and instruction in the same way from one memory. This design is simplified, cheaper and faster

  The data for input or output are retrieved in the same manner.

  The organisation of memory is done by programmers which allows them to utilise the memory's whole capacity.

  ### H. Drawbacks of the Von Neumann architecture
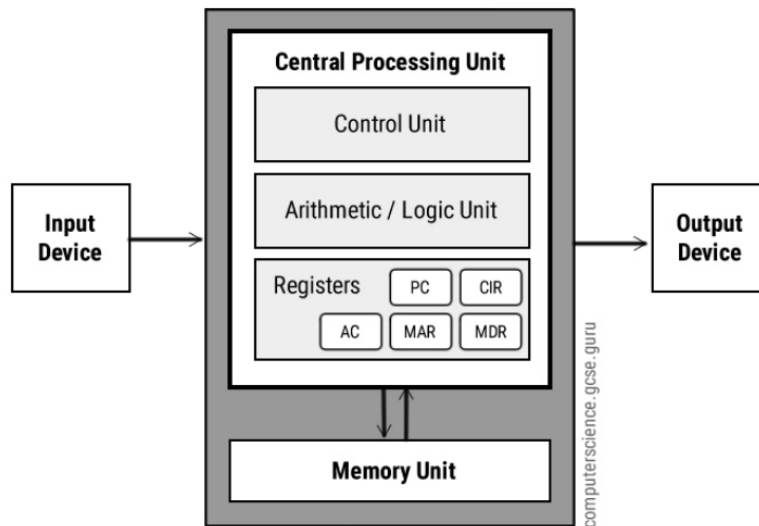 Parallel implementation is not allowed.

Von Neuman bottleneck- Instructions can only be carried out one at a time sequentially.

Risk of an instruction being rewritten due to an error in the program.

I.   What are two examples of Von Neumann architectures?
ARM7 and Pentium.

J. Diagram of the Von Neumann architecture

K. What is the Harvard architecture?
An architecture which separates its memory into two parts so data and instructions are stored separately. It also has separate buses for data transfers and instruction fetches.

L. Advantages of the Harvard architecture
Data and instructions can be fetched in parallel.

Offers higher performance.

Both memories can use different cell sizes making effective use of resources.

M. Drawbacks of the Harvard architecture
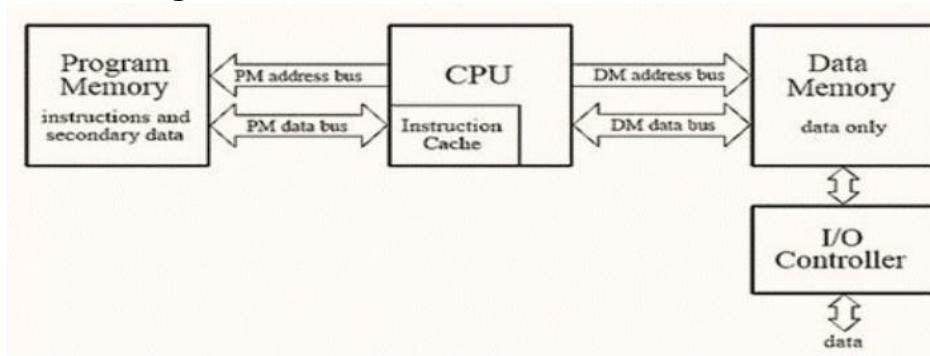Production is expensive and takes more time to manufacture.

More pins, so more complex for main board manufactures to implement.

Not widely used so more difficult to implement.

N. What are two examples of Harvard architectures?
ARM9 and SHARC(DSP)

O. Diagram of the Harvard architecture

P. What is the Modified Harvard architecture?
It has two separate busses for signal and storage, while the memory itself is one shared, physical piece,

Q. Advantages of the Modified Harvard vs traditional Harvard
Might share memory but have mechanisms like special instructions that keeps data from being mistaken for code.

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