

This exemplar Student Learning Record was produced by a Year 12 student
from Archway School

SLR 1 – “Structure and function of the processor”

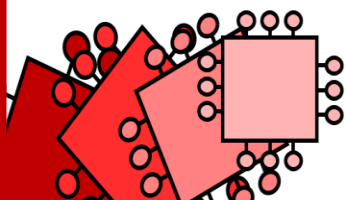
This SLR was graded at an A.

Remember an A does not mean the SLR was perfect.

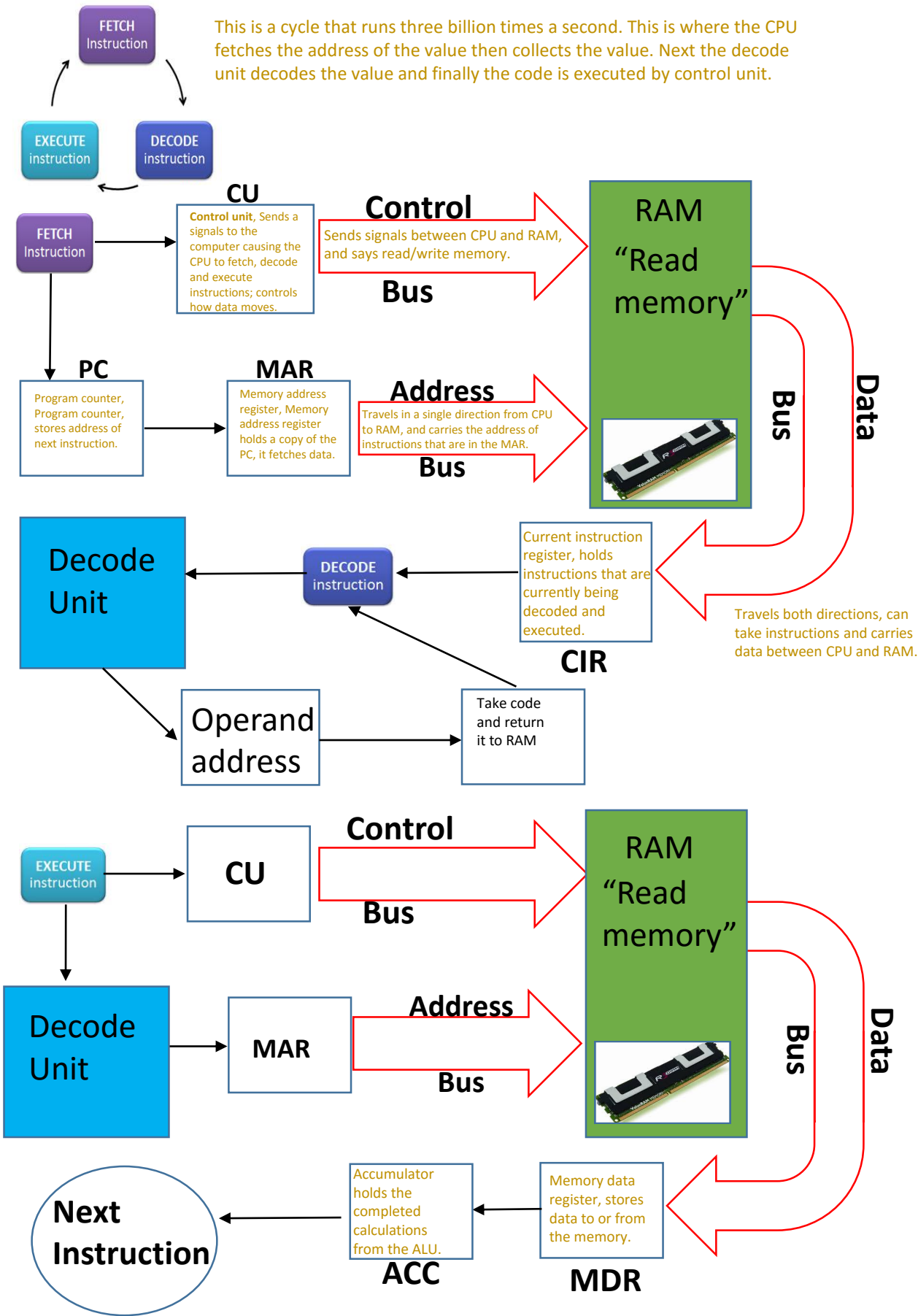
It simply means the student has produced / handed in a piece of work which is of the maximum quality we would expect from a student at this stage of academic study.

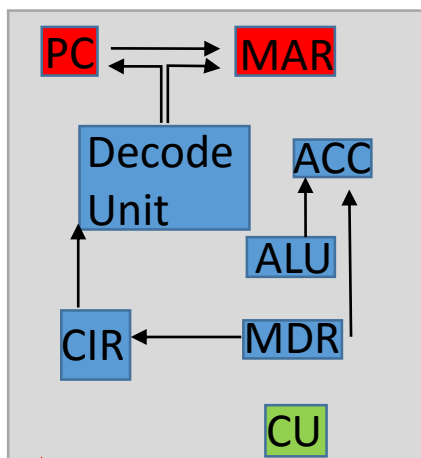
Even with A* graded work it is possible to find areas the student can improve or enhance.

NOTE: Students should be encouraged to produce the evidence for their Student Learning Record in any format they wish. This could be directly in the word document as electronic evidence, in traditional pen and paper format, or indeed in any other format such as a Power Point, Prezi or even a video! The important thing here is to assess the quality and depth of the evidence presented, not prescribe a set format.



This is a cycle that runs three billion times a second. This is where the CPU fetches the address of the value then collects the value. Next the decode unit decodes the value and finally the code is executed by control unit.





CPU-This is the central processing unit which controls the whole computer.

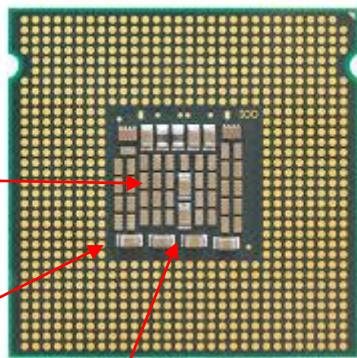


Buses-These are 'routes'(lanes) that allow data to travel between the CPU and memory.

ALU- Arithmetic logic unit, can complete sums and uses logic to solve problems.

Registers-A register is a memory location which is very fast, it fetches, decodes and executes instructions.

Cores, the cores make up CPU so the more cores the less percentage of the CPU is taken up from the cycle F/D/E. However, the more cores doesn't always mean it will improve the performance.



But, it doesn't double in efficiency

Multicores-allows more operations to run simultaneously, so it's more efficient.

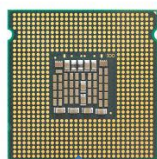
Clock speed, This is a way to improve the CPU's performance, by increasing the number of cycles per second. Can be measure in clock speeds as GHz.

But, which of these has the biggest impact of the performance of a CPU, although the clock speed may be important the number of cores allows the clock speed to advance even further. The width of the data bus means it can deliver data in less cycles but, the speed of a data bus may prove more effective than width.

Cache, This is a small piece of memory in the CPU that makes a copy of the MDR as it improves the performance by searching the cache before the memory reducing the cycle time. There are three caches in a computer lv1, lv2, and lv3. Lv1 is in the CPU and the others sit on the silicon buses outside of the CPU.

Von Neumann architecture

The first architecture of a CPU which has a single system with RAM data and instructions shared.



System Bus



Ram which shares data and, instructions



Contemporary architecture, Any modern set of disciplines that describes the functionality, the organisation and the implantation of the computer systems.

Is checked for data before RAM as the cache copies the MDR to save time searching the RAM for data already used

Registers

By

Cache

MB

RAM

GB

Hard drive

TB

These two CPU architectures are both equally as useful dependant on what the main function of your computer is.

Powers off when computer is turned off

- Instructions and data are stored in different memory units.
- Reading and writing data is done while fetching data.
- Used by RISC processors.

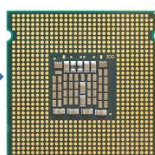
Harvard architecture

This is a newer architecture of a CPU which has two different RAM's one with instructions and one with data.



RAM instructions

System Bus



System Bus



RAM data