LCS_PCOM7E June 2022

Launching into Computer Science

Unit 2 Activities

Differences between registers and memories
Summarise the functionalities of a CPU
Different types of computers

Differences between registers and memories

Difference between a register and a memory is that register is: capacity of register is small. It is designed for keeping various specific information such as locations of instructions, result of calculation, instructions that just been decoded, etc. Register is located in the CPU and it is the fastest but smallest "memory" in a computer.

Memory is divided into primary and secondary memory. Primary memory in the CPU refers to the Random Access Memory (RAM) and Read Only Memory (ROM). Both RAM and ROM are usually located at the mother board where the CPU located. The memory in RAM is only temporary and will be deleted when the computer is switched off, where the data in ROM is not deleted and cannot be changed. RAM is usually used to store the operating system, applications and data currently in use. The main function of ROM is for the start-up of the computer. The capacity of primary memory is larger than the registers but slower than the registers.

Secondary memory (secondary storage) is a large and easily extendable memory usually located outside the computer. The rate is the slowest among three items discussed. It stores large amount of data which are not currently in use. The storage is not temporary. As long as it is not erased, the data will remain in the memory.

Summarise the functionalities of a CPU

A CPU is basically comprised: A control unit, a arithmetic logic unit ("ALU"), registers, cache and clock. The functions of control unit is to fetch, decode and execute instructions. It also controls various hardware of the computer and also controls the data flows within the computer.

The functions of the ALU is to perform arithmetic calculations and carries out logical decisions making, It also moves data to and from primary memories.

The functions of register is to store the address of the instructions to be carried out and temporarily store the result of calculation. It also stores the instructions that have just been decoded.

The function of cache is to temporarily store data and program which will be used frequently.

The function of the clock is to control the rate of the computer.

Different types of computers

Computer can be classified by the data type, classified by size and classified by function.

When classified by data type, such as analogy (data are entered into the "computer" by physical means such as speedometer), digital computer (computer that data are entered using electricity voltage, ie 5V for 1 and 0V for 0), hybrid computer (combine of both digital and analog computer such as equipment used to measure heartbeat).

When classified by size, such as micro-computer (laptops, tablets), mini computers (such as AS/400 to be used by about 300 users at the same time), the main frame (computers used by large corporation to process massive data), super computer (being the fastest new computer).

When classified by functionality, such as work stations (single user, e.g. docking station, Mac Power book), servers (computers build to help other computers, e.g. web server, file server, printer server, e.g. google server), embedded computers (simple micro-controller unit embedded on various electronic appliances, e.g. GPS systems, central heating system)