Tutorial 04

01. What is the purpose of general-purpose registers in computer architecture and how are they typically used?

02. How does the program counter register contribute to the execution of a program in a CPU?

03. What role does the status register (FLAGS) play in the CPU and what types of information does it typically contain?

04. Why are registers considered the fastest form of memory in a computer and how does their speed impact overall system performance?

05. How is the ~~colle~~ allocation of registers managed in a computer system and what techniques are used to optimize their utilization?

01. The general-purpose registers are used to calculate data and store addresses. The control register is further classified into the PC to control program progress and the CCR (condition code register) to test conditions. General purpose registers are additional registers that are present in CPU which is used for either memory address or data whenever needed.

k-map.

02. The program counter (PC) is a register that manages the memory address of the instruction to be executed next. The address specified by the PC will be +n (+1 for a 1-word instruction and +2 for a 2-word instruction) each time one instruction is executed.

03. Status flags enable an instruction to act based on the result of a previous instruction.
The Status register is a hardware register that contains information about the state of the processor.
There are three types of program status register.
Application Program Status register (APSR)
Interrupt Program Status register (IPSR)
Execution Program Status register (EPSR)

04. Register memory is the smallest and fastest memory in a computer. It is not a part of the main memory and is located in the CPU in the form of registers, which are the smallest data holding elements. A register temporarily holds frequently used data, instructions and memory address that are to be used by CPU.
The size of the registers, which is sometimes called the word size, indicates the amount of data with which the computer can work at any given time.

05. Registers are a type of computer memory used to accept, store and transfer data and instructions used by the CPU right away. During the execution of a program, registers are used to store data temporarily.
Genetic algorithms (GCRs), genetic algorithms (GMOs) and constrained optimization (LP) are the techniques are used for optimization.