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Evolution of Microprocessor:

Microprocessors were categorized into five generations: first, second, third, fourth, and fifth generations. Their characteristics are described below:

First-generation

The microprocessors that were introduced in 1971 to 1972 were referred to as the first generation systems. First-generation microprocessors processed their instructions serially—they fetched the instruction, decoded it, then executed it. When an instruction was completed, the microprocessor updated the instruction pointer and fetched the next instruction, performing this sequential drill for each instruction in turn.

Second generation

By the late 1970s, enough transistors were available on the IC to usher in the second generation of microprocessor sophistication: 16-bit arithmetic and pipelined instruction processing.
Motorola's MC68000 microprocessor, introduced in 1979, is an example. Another example is Intel's 8080. This generation is defined by overlapped fetch, decode, and execute steps (Computer 1996). As the first instruction is processed in the execution unit, the second instruction is decoded and the third instruction is fetched.
The distinction between the first and second generation devices was primarily the use of newer semiconductor technology to fabricate the chips. This new technology resulted in a five-fold increase in instruction, execution, speed, and higher chip densities.

Third generation

The third generation, introduced in 1978, was represented by Intel's 8086 and the Zilog Z8000, which were 16-bit processors with minicomputer-like performance. The third generation came about as IC transistor counts approached 250,000.
Motorola's MC68020, for example, incorporated an on-chip cache for the first time and the depth of the pipeline increased to five or more stages. This generation of microprocessors was different from the previous ones in that all major workstation manufacturers began developing their own RISC-based microprocessor architectures (Computer, 1996).

Fourth generation

As the workstation companies converted from commercial microprocessors to in-house designs, microprocessors entered their fourth generation with designs surpassing a million transistors. Leading-edge microprocessors such as Intel's 80960CA and Motorola's 88100 could issue and retire more than one instruction per clock cycle.

Fifth generation

Microprocessors in their fifth generation, employed decoupled super scalar processing, and their design soon surpassed 10 million transistors. In this generation, PCs are a low-margin, high-volume-business dominated by a single microprocessor.

Classification of Microprocessor:

The microprocessor is identified with the word size of data. For E.g. The ALU can perform a 4- bit data operation at a time these microprocessor is called as 4-bit microprocessor.

4-Bit Processors

```
INTEL 404 4040
```

8-Bit Processors

```
8008 8080 8085 MOTOROLA 6800 (M6800)
```

16-Bit Processors

```
8086 8088 Zilog Z800 80186 80286
```

32-Bit Processors

```
Intel 80386 80387 80486 PENTIUM PENTIUM PRO
```

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