Name : محمد حسين ابراهيم ابراهيم

B.N: 694

Date:26/5/2020

TOPLC: Computer Architecture

GITHUP LINK:https://github.com/mohamedhussein12/html-project-New-Repository/tree/master

GITHUP PAGE(website): https://mohamedhussein12.github.io/html-project-New-Repository/

APPLICATION BRIEF:

computer architecture is a set of rules and methods that describe the functionality, organization, and implementation of computer systems. Some definitions of architecture define it as describing the capabilities and programming model of a computer but not a particular implementation. In other definitions computer architecture involves instruction set architecture design, microarchitecture design, logic design, and implementation.

Computer architecture is a specification describing how hardware and software technologies interact to create a computer platform or system. When we think of the word architecture, we think of building a house or a building. Keeping that same principle in mind, computer architecture involves building a computer and all that goes into a computer system. Computer architecture consists of three main categories

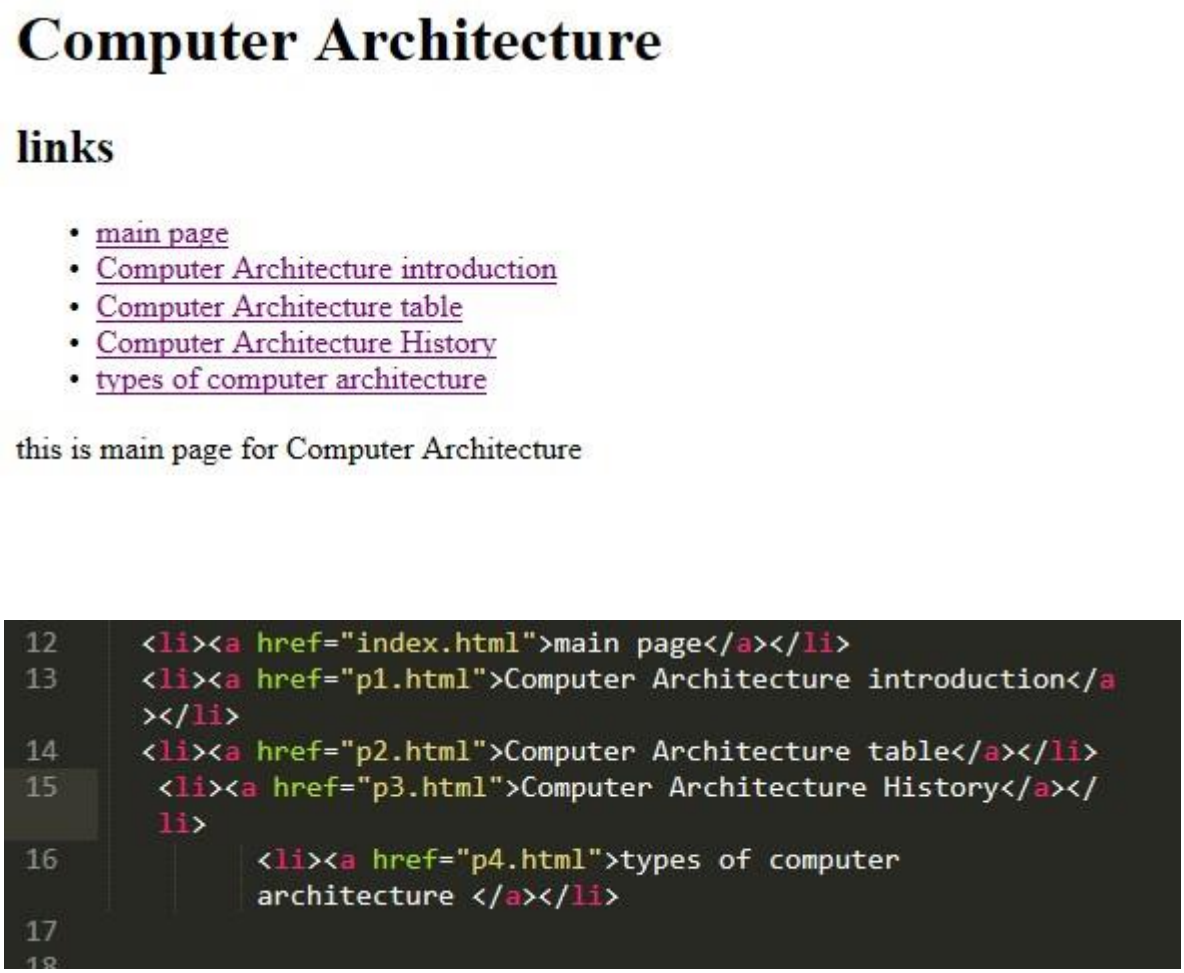
System design – This includes all the hardware parts, such as CPU, data processors, multiprocessors, memory controllers and direct memory access.

This part is the actual computer system.

Instruction set architecture – The includes the CPU's functions and capabilities, the CPU's programming language, data formats, processor register types and instructions used by computer programmers. This part is the software that makes it run, such as Windows or Photoshop or similar programs.

Microarchitecture – This defines the data processing and storage element or data paths and how they should be implemented into the instruction set architecture. These might include DVD storage devices or similar devices

Screenshot

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12      <li><a href="index.html">main page</a></li>
13      <li><a href="p1.html">Computer Architecture introduction</a
        ></li>
14      <li><a href="p2.html">Computer Architecture table</a></li>
15       <li><a href="p3.html">Computer Architecture History</a></
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17
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Introduction to computer systems.
Architecture of computer systems.

Advantages of computer Architecture	disadvantages of computer Architecture
1-Multitasking is one of the major advantage of computer. Person can perform multiple task, multiple operation, calculate numerical problems within few seconds. Computer can perform trillion of instructions per second.	1-Virus is a worm and hacking is simply an unauthorized access over computer for some illicit purpose. Virus is being transferred from email attachment, viewing an infected website advertisement, through removable device like USB etc. once virus is transferred in host computer it can infect file, overwrite the file etc.
- 2-Now computer is not just a calculating device. Now a dayâ€™s computer has very important role in human life. One of the main advantages of computer is its incredible speed, which helps human to complete their task in few seconds. All the operations can be performed very fast just because of its speed elsewise it takes a long time to perform the task.	2-Online cyber-crime means computer and network may have used in order to commit crime. Cyberstalking and Identity theft are the points which comes under online cyber-crimes. For example: one may get the access of the access to your shopping account like amazon account now that person will be able to know your personal details like debit card or credit card number which can be than misused.
3-It is a low cost solution. Person can save huge data within a low budget. Centralized database of storing information is the major advantage that can reduce cost.	3-Mainly past generation was not used of the computer or they have the knowledge of computer they faced a big problem when computer came in field. As we have seen in banking sector senior bank employees faced this problem when computer came to the banking sector.
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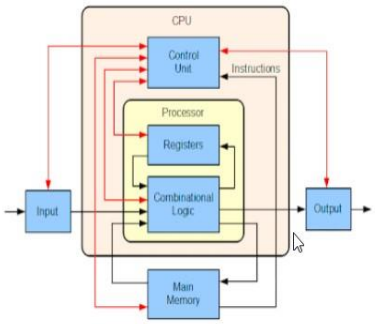
5-Computer Technology helps to keep in contact with our family and re-connect with old friends or make new friends by using any services such as Facebook, Viber, WhatsApp, Skype and many more. People are using online dating to socialise and connect with others also.	5-Thinking ability. Stops us from thinking about solving problems.



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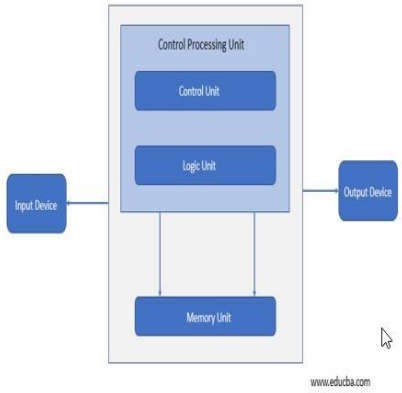
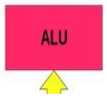
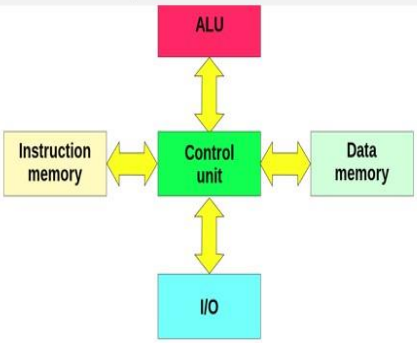
John von Neumann's 1945 paper, First Draft of a Report on the EDVAC, which described an organization of logical elements;[5] and Alan Turing's more detailed Proposed Electronic Calculator for the Automatic Computing Engine, also 1945 and which cited John von Neumann's The term â€œarchitectureâ€ in computer literature can be traced to the work of Lyle R. Johnson and Frederick P. Brooks, Jr., members of the Machine Organization department in IBM's main research center in 1959. Johnson had the opportunity to write a proprietary research communication about the Stretch, an IBM-developed supercomputer for Los Alamos National Laboratory (at the time known as Los Alamos Scientific Laboratory). To describe the level of detail for discussing the luxuriously embellished computer, he noted that his description of formats, instruction types, hardware parameters, and speed enhancements were at the level of â€œsystem architectureâ€, a term that seemed more useful than â€œmachine organizationâ€. Subsequently, Brooks, a Stretch designer, opened Chapter 2 of a book called Planning a Computer System: Project Stretch by stating, "Computer architecture, like other architecture, is the art of determining the needs of the user of a structure and then designing to meet those needs as effectively as possible within economic and technological constraints[8]
Brooks went on to help develop the IBM System/360 (now called the IBM zSeries) line of computers, in which â€œarchitectureâ€ became a noun defining â€œwhat the user needs to knowâ€.[9] Later, computer users came to use the term in many less explicit ways.[10]
The earliest computer architectures were designed on paper and then directly built into the final hardware form. Later, computer architecture prototypes were physically built in the form of a transistorâ€“transistor logic (TTL) computerâ€”such as the prototypes of the 6800 and the PA-RISCâ€”tested, and tweaked, before committing to the final hardware form. As of the 1990s, new computer architectures are typically "built", tested, and tweakedâ€”inside some other computer architecture in a computer architecture simulator; or inside a FPGA as a soft microprocessor; or bothâ€”before committing to the final hardware form

types of computer architecture
1. Von-Neumann Architecture
There is a bus (address bus/data bus/control bus) used for the instruction and data code execution. Input device takes data or instruction and the Central processing unit (CPU) performs one operation at a time, either fetching data or instruction in/out of the memory. Once the operation is done it is sent to the output device. Control and logic units for processing operations are within the central processing unit



2. Harvard Architecture
Harvard architecture is used when data and code is present in different memory blocks. A separate memory block is needed for data and instruction. Data can be accessed by one memory location and instruction can be accessed by a different location. It has data storage entirely contained within the central processing unit (CPU). A single set of clock cycles is required. The pipeline is possible. It is complex to design. CPU can read and write instructions and process data access. Harvard architecture has different access codes and data address spaces that is, the instruction address zero is not the same as data address zero. Instruction address zero identifies 24-byte value and data address zero identifies 8-byte value which is not the part of the 24-byte value.





3. Instruction Set Architecture

To make up the architecture, instruction set architecture is needed because it has a set of instructions that the processor understands. It has two instruction set one is RISC (reduced instruction set computer) and the second is CISC (complex instruction set computer).

Reduced instruction set computer architecture was realized in the 90â€™s by IBM. Instruction has multiple address modes, but programs do not use all of them that is the reason multiple address modes were reduced. This helps the compiler to easily write the instructions, performed is increased.

Complex instruction set architecture is the root of compilers because earlier compilers were not there to write programs, to ease programming instructions are added. The best performance is obtained by using simple instruction from ISA

4. Microarchitecture

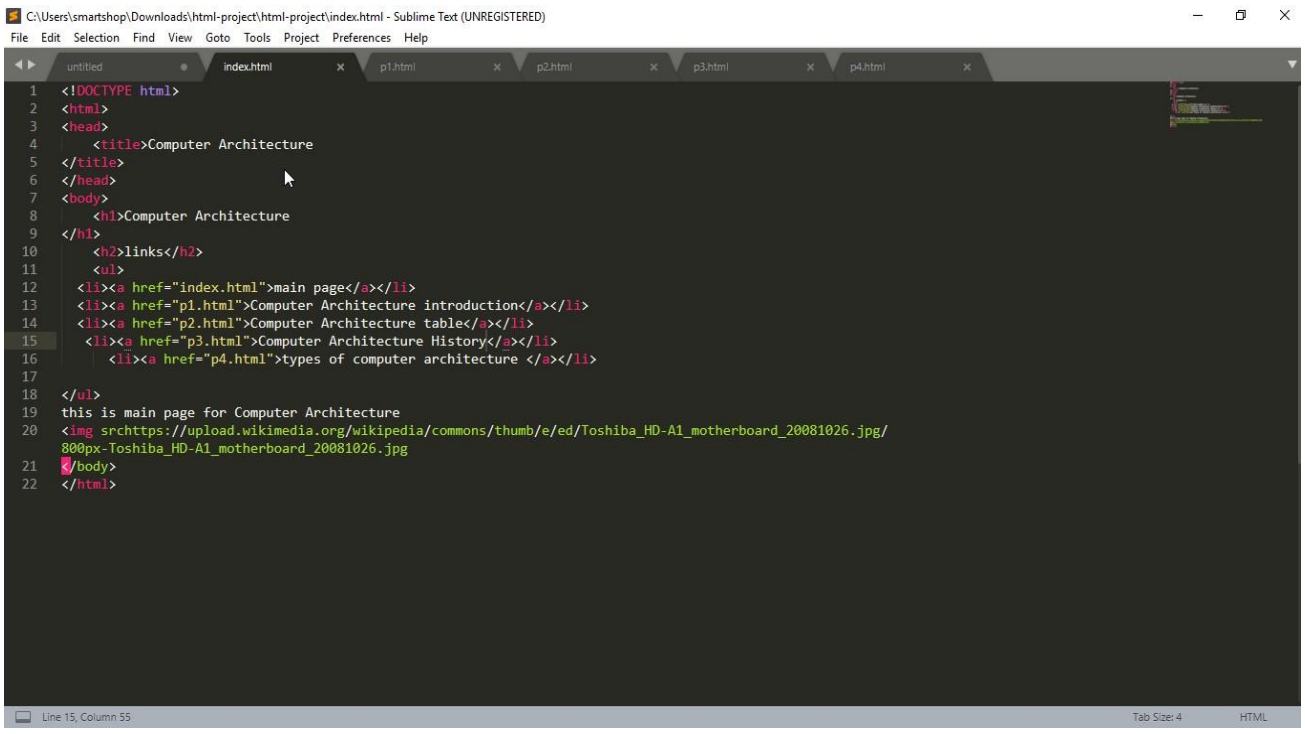
Microarchitecture is known as computer organizations and it is the way when instruction set architecture is a built-in processor. Instruction set architecture is implemented with various microarchitecture and it varies because of changing technology.

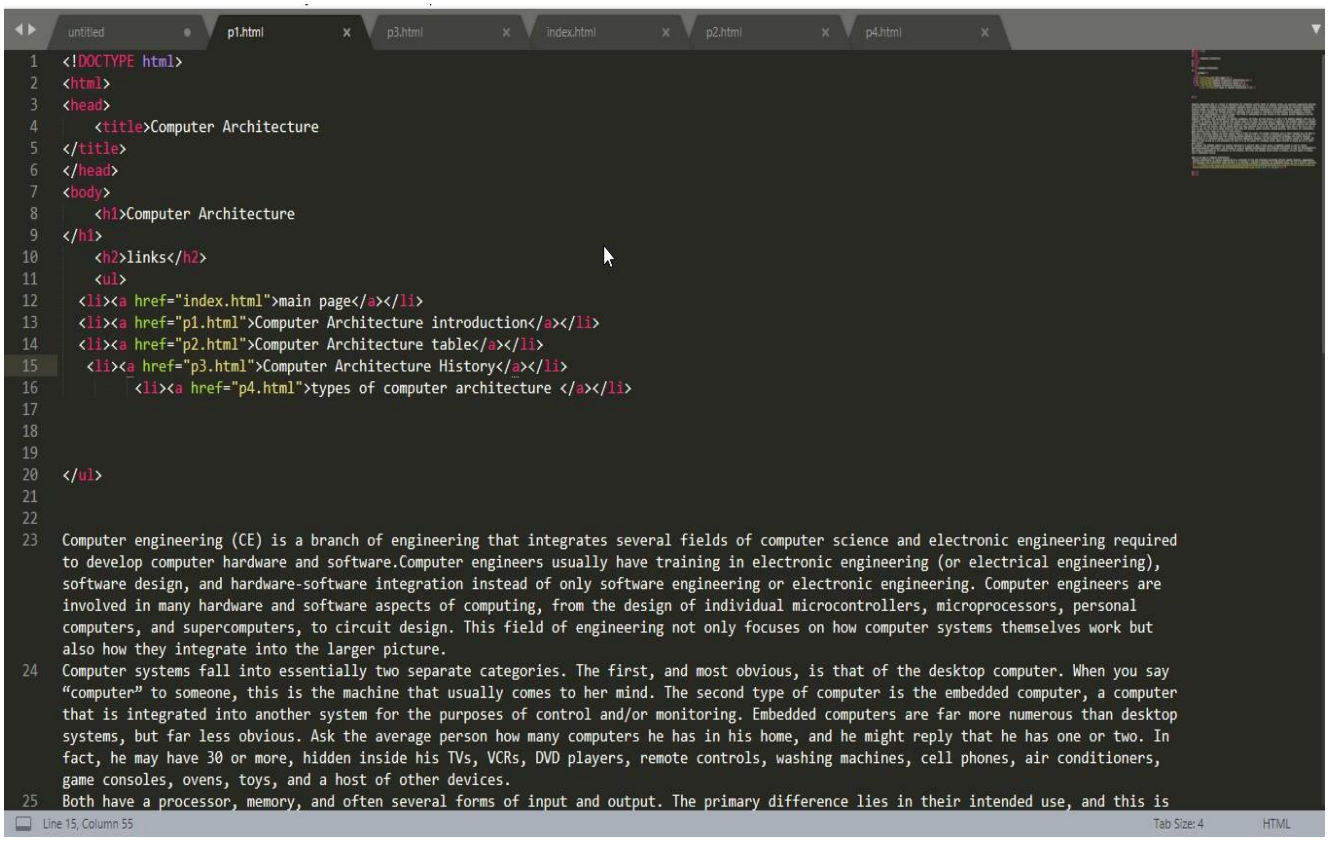
Microarchitecture performs in a certain way. It reads the instruction and decodes it, will find parallel data to process the instruction and then will process the instruction and output will be generated.

It is used in microprocessors, microcontrollers. Some architectures overlap multiple instructions while executing but this does not happen in microarchitecture. Execution units like arithmetic logic units, floating-point units, load units, etc are needed and it performs the operation of the processor. There are microarchitecture decisions within the system such as size, latency, and connectivity of the memories.

5. System Design

The name defines itself, the design will satisfy user requirements such as architecture, module, interfaces and data for a system and it is connected to product development. It is the process of taking marketing information and creating product design to be manufacture. Modular systems are made by standardizing hardware and software.

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main page
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18  </ul>
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has two instruction set one is RISC (reduced instruction set computer) and the second is CISC (complex instruction set computer).
37  <br>
38
39  Reduced instruction set computer architecture was realized in the 90's by IBM. Instruction has multiple address modes, but programs do not
    use all of them that is the reason multiple address modes were reduced. This helps the compiler to easily write the instructions, performed
    is increased.
40  <br>
41
42  Complex instruction set architecture is the root of compilers because earlier compilers were not there to write programs, to ease
    programming instructions are added. The best performance is obtained by using simple instruction from ISA
43  <br>
44  4. Microarchitecture
45  <br>
46  Microarchitecture is known as computer organizations and it is the way when instruction set architecture is a built-in processor.
    Instruction set architecture is implemented with various microarchitecture and it varies because of changing technology.
47  <br>
48
49  Microarchitecture performs in a certain way. It reads the instruction and decodes it, will find parallel data to process the instruction
    and then will process the instruction and output will be generated.
50  <br>
51
52  It is used in microprocessors, microcontrollers. Some architectures overlap multiple instructions while executing but this does not happen
    in microarchitecture. Execution units like arithmetic logic units, floating-point units, load units, etc are needed and it performs the
    operation of the processor. There are microarchitecture decisions within the system such as size, latency, and connectivity of the memories.
53  <br>
54  <br>
55
56  5. System Design
57  <br>
58
59  The name defines itself, the design will satisfy user requirements such as architecture, module, interfaces and data for a system and it is
    connected to product development. It is the process of taking marketing information and creating product design to be manufacture. Modular
    systems are made by standardizing hardware and software.
60
61  </html>
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