Assignment 1

1. What is computer?

Ans:
An electronic machine that can store, find and arrange information, calculate amounts and control other machines

2. What are different components of computer?

Ans:
There are the 5 major components of a computer:
1) Motherboard
2) Central Processing unit (CPU)...
3) Graphical Processing unit (GPU)...
4) Random Access Memory (RAM)
5) Storage device

3. What is storage device and types of storage devices?

Ans:
The storage unit is part of the computer system which is employed to store the information.
It can also store information/data both temporarily and permanently.

There are two types of storage devices:
1) Primary storage
2) Secondary storage

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4. What is mean by Toolchain or x86 Toolchain?

As:

Tool chain is considered as set of software (Tool) which are used to convert human understandable programme into Machine understandable programme (Binary).

5. What is CPU register? What are types of it? and explain use of each CPU register.

As:

A processor register is one of a small set of data holding places that are part of the computer processor.

1. Arithmetic register:- An arithmetic register is a type of CPU register used to perform arithmetic progression
2. Base register:-
   It is used to store the base adress of a memory segment or data structure.
3. Count register:-
   It is used to store a count value typically used in iterations or repetitive operations.
4. Data register:-
   It is used to store & manipulate data temporarily while its being processed.
5. Stack pointer:-
   It manages the system stack, a region of memory that stores data temporarily
6. Base pointer:- It is used to store the base address of a stack frame.

Source index :-
It is used to store the index in memore, typically used in string & array operations.

6. What is operating system & different tasks of O.S.?

Ans:
An O.S is the program that, after being initially loaded into the computer by a boot program, manages all of the other application programs in a computer.
There are 5 tasks of O.S.
1. File managment
2. Process managment
3. Memory managment
4. CPU sheduling
5. Hardware abstraction.

7. Explain working of each Tool from Toolchain. i.e. Editor, Preprocessor, compiler, Assembler, Linker, Loader.

Ans:
Here's an explanation of each tool in the toolchain:

1. Editor :-
A text editor where you write your source code. It's where you create & modify you program's code.
Programer uses editor to write the programme

loader is responsible to load the .exe file.

After the loading .exe file into ram its considered as a process & its executed by its Operating system.

8. Explain each step of below diagram.

Ans:-

By using the editor programer write the program we solve to the file as a hello.c.
The output of compiler is .obj file which is in binary format.
.obj file divided into three parts they are:
1. Text 2. Data 3. Symbol

Now we pass .obj file to link our .obj file with its dependent. The linker creates .exe file.
Inside .exe file the primary header is added.
Now the process loaded into the ram.
Inside the microprocessor their is no sufficient memory.
Now the data from segment gets copied into the instructions. from that instruction single instruction get fetch at a time & forworded that instructions for execution purpose.
Instruction Pointer is responsible to fetch that single instruction at a time.
Now the instructions get forworded to ALU if the instruction is related to Arithmetic.
Otherwise it get forworded to CU.

Flags register is responsible to indicates the internal status of the microprocessor.
Now the instruction gets stored inside CPU registers.
Inside all the above CPU register the execution of the instruction get performed.
Now the output of the instructions gets forwarded to O.S
After getting the output the result gets on our console.

9. What are the contents of Physical Header?

Ans:

The physical header in refers to the CPU's physical address space, which includes various registers & memory areas that store control information.

The contents of physical header is as follows:

1. Memory Managment unit registers.
2. CPU control registers
3. Memory address registers
4. control registers:
5. Interrupt control registers.
6. Cache control registers.
7. Memory protection registers.

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10. What is mean by text, data, stack, section?

Ans:

Text segment :-

Text segments store the executable instructions of a program. Also the text segment is often read-only, to prevent a program from accidentally modifying its instructions.

Data :-

Data extensions contains memory locations used in the program.
The data extensions is also known as data segment.

Stack :-

Stack memory is a section in memory used by functions to store data such as local variables & parameters that will be used by the malware to perform its nefarious activity on a compromised device.