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Homework 1

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1.

* Computer Architecture is the description of the structure of a computer system made from its components and parts.
* Moore’s Law states that every two years the number of integrated circuit resources would double.
* Amdahl’s Law states that the performance enhancement possible with a given improvement is only as good as the feature is used.
* A high-level program is a portable language that is composed of words and arithmetic notation that can be translated by a compiler into assembly language.
* An assembly program is written in assembly language, which is a symbolic version of machine instructions.
* Machine code is language that the computer understands and is based on 0s and 1s.
* Compilers translate programs written in higher-level languages into assembly code that the hardware can execute.
* An assembler translates a symbolic version of an instruction into the binary version of that same instruction.
* An operating system is a program that manages the resources of a computer for the benefit of the other programs that run on that computer. It interfaces between a user’s program and the hardware.
* The CPU or processor is the active part of the computer that follows the instructions of a program to do something.
* A multicore multiprocessor contains multiple processors or “cores” in a single integrated circuit.
* CPI is the average number of clock cycles each instruction takes to execute.
* CPU time is the time the CPU spends computing for a task and does not include the time spent waiting for I/O or running other .programs
* MIPS is an alternative t time and stands for million instructions per second. It’s equation is MIPs =
* Throughput or bandwidth is the measure of performance. It calculates based on the number of tasks completed per unit of time.
* A benchmark program is used to measure performance by forming a workload that a user will hope to predict the performance of the actual workload.
* Static power is fixed power while dynamic power changes.
* There are 4 main classes of computers: personal computers that are general purpose and subject to a cost/performance tradeoff, server computers that are network based and have high performance, supercomputers that are high end and used for engineering calculations, and embedded computers that are hidden as a component of a system. As the PostPC era has continued to grow, there are 2 more classes that have been introduced: personal mobile devices which are battery operated along with cloud computing.

2.

The compiler will take the high-level language and transform it into assembly language. After this, the assembly language will be taken by the assembler and translate it into machine language. This machine language will be able to be taken by the computer processor to execute any instructions given to it.