Name: OTENE VICTOR A

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Briefly explain each of the following architectures -RISC

 -CISC

 -VLIW

-RISC (Reduced instruction set computer)

It is a CPU design plan based on simple orders and acts fast. There is a small or reduced set of instructions. Here, every instruction is expected to attain very small jobs. In this machine, the instruction sets are modest and simple, which help in comprising more complex commands. Each instruction is about the similar length; these are wound together to get compound tasks done in a single operation. Most commands are completed in one machine cycle. This pipelining is a crucial technique used to speed up RISC machines.

Hardwired control unit

Data path

(Instruction) (Data)

 Main memory

Instruction cache

Data cache

Reduced instruction set computer is a microprocessor that is designed to carry out few instructions at the similar time. Based on small commands, these chips need fewer transistors, which make the transistors inexpensive to design and produce. It used in portable devices due its power efficiency. For example, apple iPod and Nintendo DS.

-CISC (Complex instruction set computer)

The CISC approach attempts to minimize the number of instructins per program, sacrificing the number of cycles per instruction. Computers based on the CISC architecture are designed to decrease the memory cost. Because, the large programs need more storage, thus increasing the memory cost and large memory becomes more expensive. To solve these problems, the number of instructions per program can be reduced by embedding the number of operations in a single instruction, thereby making the instruction more complex.

 Control unit

Instruction & data path

Micro program control memory

Cache

Main memory

-VLWI (Very long instruction word)

This increases the number of instructions that are processed per cycle. It is a concatenation of several short instructions and requires multiple execution units in parallel, to carry out the instructions in a single cycle. A language compiler or pre-processor which then disassembles and transfers each operation to an appropriate execution unit. These operations are put into a very long instruction word which the processor can then take apart without further analysis, handing each operation to an appropriate functional unit.

The main advantage of VLIW processor is that complexity is moved from the hardware to the software to the software, which means that the hardware can be smaller, cheaper, and require less power to operate.

Multi-ported Register File

Program Counter

Instructions Cache

Functional ………. Functional

 Unit 1 Unit 1

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