UNIT I – Basic Structure of Computer

Functional units – Basic operational concepts – Bus Structures – Performance – Memory locations and addresses – Memory operations – Instruction and Instruction sequencing — Addressing modes – Assembly language – Case study: RISC and CISC Architecture.

PROBLEMS IN INSTRUCTIONS

Operation of Computer Hardware

PROBLEM 5

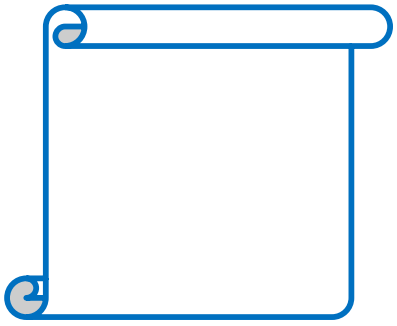
Compiling Two C Assignment Statements into MIPS

The segment of a C program contains the five variables a, b, c, d, and e. Since Java evolved from C, this example and the next few work for either high-level programming language:

a = b + c;

d = a – e;

Solution:



PROBLEM 6

A somewhat complex statement contains the five variables f, g, h, i, and j: f = (g + h) – (i + j);

What might a C compiler produce?

Solution:

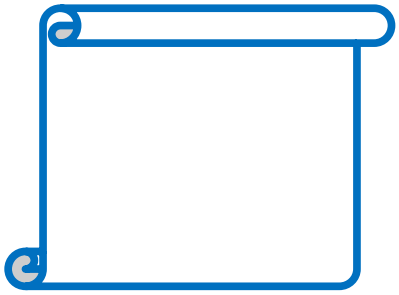
PROBLEM 7

Compiling Two C Assignment Statements into MIPS

Let's assume that A is an array of 100 words and that the compiler has associated the variables g and h with the registers $s1 and $s2 as before. Let's also assume that the starting address, or base address, of the array is in $s3. Compile this C assignment statement:

g = h + A[8];

Solution:



PROBLEM 8

Assume variable h is associated with register $s2 and the base address of the array A is in $s3. What is the MIPS assembly code for the C assignment statement below?

A[12] = h + A[8]

Solution: