6.13 Operand Addressing Modes

A processor usually contains a special register, called an instruction register, that is used to hold an instruction that is being decoded. The possible types of operand addresses and the cost of each can be envisioned by considering the location of the operand and the references needed to fetch the value. An immediate value is the least expensive because the value can be found in the instruction register. A general-purpose register reference is the next most expensive, and an indirect memory reference is the most expensive. Figure 6.6 lists the possibilities, and illustrates the hardware units involved in resolving each.

Figure 6.6 Illustration of the hardware units accessed when fetching an operand in various addressing modes. Indirect references take longer than direct references.