Fig. 5.9 Computer Components: Top-Level View

PC = Program counter
IR = Instruction register
MAR = Memory address register
MBR = Memory buffer register
I/O AR = I/O address register
I/O BR = I/O buffer register
Fig. 5.10 Characteristics of a Hypothetical Machine

(a) Instruction format

<table>
<thead>
<tr>
<th>Op Code</th>
<th>Address</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(b) Integer format

Program Counter (PC) = Address of instruction
Instruction Register (IR) = Instruction being executed
Accumulator (AC) = Temporary storage

(c) Internal CPU registers

0001 = Load AC from Memory
0010 = Store AC to Memory
0101 = Add to AC from Memory

(d) Partial list of opcodes
Fig. 5.11  Example of Program Execution
Fig. 5.12  The Memory Hierarchy