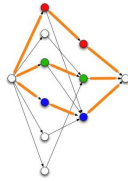




Eastern Mediterranean University
School of Computing and Technology



ITEC255
Computer Organization
& Architecture

Tutorial for Chapter 3

Binary to Hexadecimal Conversion

- For binary to hexadecimal conversion, each digit, starting from the least significant bit, should be multiplied with:

$$2^x, \text{ where } x \geq 0$$

where x is the digit number.

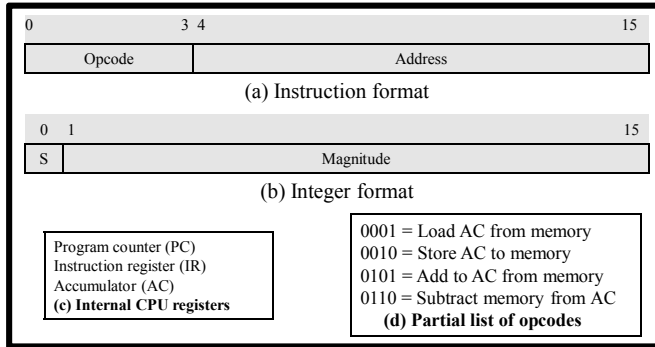
- Example:

$$\begin{array}{cccc} \frac{1}{2^3} & \frac{0}{2^2} & \frac{1}{2^1} & \frac{0}{2^0} \\ \times & \times & \times & \times \\ \hline 8 & 4 & 2 & 1 \\ \parallel & \parallel & \parallel & \parallel \\ 8+ & 0+ & 2+ & 0 = A \end{array}$$

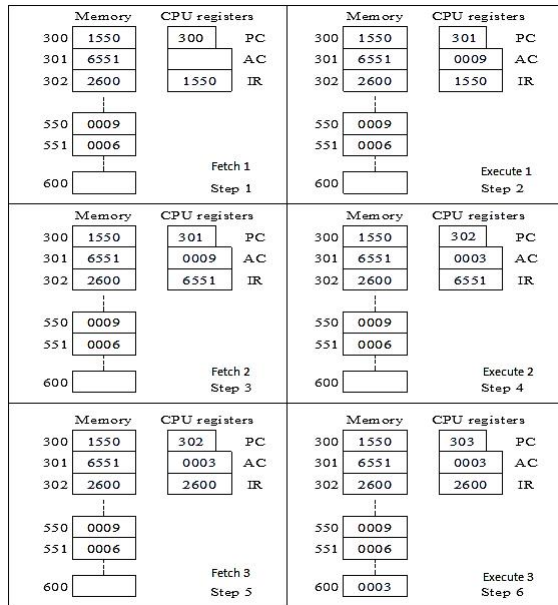
Binary Value	Decimal Value	Hexadecimal Value
0000	0	0
0001	1	1
0010	2	2
0011	3	3
0100	4	4
0101	5	5
0110	6	6
0111	7	7
1000	8	8
1001	9	9
1010	10	A
1011	11	B
1100	12	C
1101	13	D
1110	14	E
1111	15	F

Exercise 1

- Consider a hypothetical machine that is shown in the figure below.
- Show the program execution for the following program:
 1. Load AC from memory location 550.
 2. Subtract content of memory location 551 from AC.
 3. Store AC to memory location 600.
- Assume that the values retrieved from memory location 550 and 551 are 9 and 6, respectively.



Exercise 1 - Solution



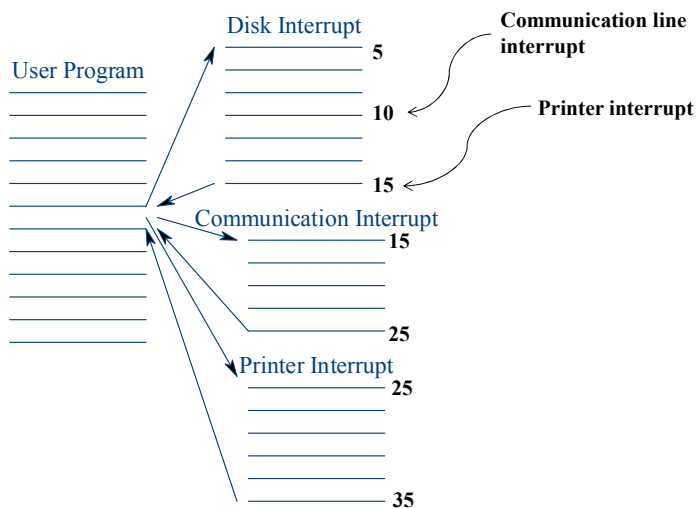
Exercise 2

- Consider a system with three I/O devices:
 - ✓ Printer (priority = 2)
 - ✓ Disk (priority = 4)
 - ✓ Communication line (priority = 5)
- Suppose that a user program (priority = 0) begins and a disk interrupt occurs at time $t=5$. While disk interrupt carries on, a communication line interrupt occurs at $t=10$.
- Then while communication interrupt carries on, a printer interrupt occurs at time $t=15$. After completing all of interrupts, control returns to user program.
- Assume that the duration for job completion in each device is 10s.
- Draw the timeline diagram for each of the following:
 - a) sequential interrupt processing
 - b) nested interrupt processing

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Exercise 2 - Solution

a) Sequential Interrupt Processing



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Exercise 2 - Solution

b) Nested Interrupt Processing

