COSC 290

Class Exercises #10 (Ch. 5)

* + - 1. Fill in the following table to show how the given integers are represented, assuming that 16 bits are used to store values and the machine used two’s complement notation.



|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Integer | Binary | Hex | 4 Byte Big Endian | 4 Byte Little Endian |
| 28 | 0000000000011100 | 001C | 001C | C100 |
| 2216 | 0000100010101000 | 08A8 | 08A8 | 8A80 |
| -18675 | 1011011100001101 | B70D | B70D | D07B |
| -12 | 1111111111110100 | FFF4 | FFF4 | 4FFF |
| 31456 | 0111101011100000 | 7AE0 | 7AE0 | 0EA7 |

1. Convert the following expressions from infix to reverse Polish (postfix) notation.
   1. (8 – 6) / 2 + 7 \* (4 – 2) + 3 – 5

86-2/742-\*+35-+

* 1. W \* (X + Y \* (U \* V))/(U \* (V – X / Y))

WXYUV\*\*+\*UVXY/–\*/

1. Use a stack to evaluate the following postfix expression.

3 5 7 + 2 1 - \* 1 + +

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | 1- |  |  |  |  |  |  |  |  |  |
| 7+ |  | 2 |  | 1\* |  | 1+ |  |  |  |  |  |
| 5 |  | 12 |  | 12 |  | 12 |  | 13+ |  |  |  |
| 3 | -> | 3 | -> | 3 | -> | 3 | -> | 3 | -> | = 16 |  |

1. In a computer instruction format, the instruction length is 11 bits and the size of an address field is 4 bits. Is it possible to have

5 two-address instructions

45 one-address instructions

32 zero-address instructions

using the specific format? If so, show the encoding.

Yes, it is possible:

A paper with writing on it

Description automatically generated





|  |  |
| --- | --- |
| **Mode** | **Value Loaded into AC** |
| Immediate | 0x1000 |
| Direct | 0x1400 |
| Indirect | 0x1300 |
| Indexed | 0x1000 |