**CSCI 360 EQUates and Extended Mnemonics**

**EQUATES: Assigning a value to a label**

* Format: label EQU expression
* gives label the value of the expression
* every occurrence of label will be treated as if it was the expression

R0 EQU 0

R1 EQU 1

...

R15 EQU 15

Then R# can be used whenever a register number is needed.

L 3,NUM1 can be replaced with L R3,NUM1

**Extended Branch Mnemonics**

* intended to make the coding of branch instructions easier by eliminating the need to explicitly specify a mask

**After COMPARE instructions:**

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| --- | --- | --- | --- | --- |
| Extended Mnemonic | | Meaning | Replaces | |
| RX version | RR version |  | RX version | RR version |
| BH D(X,B) | BHR R | Branch on HIGH | BC B‘0010’,D(X,B) | BCR B‘0010’,R |
| BL D(X,B) | BLR R | Branch on LOW | BC B‘0100’,D(X,B) | BCR B‘0100’,R |
| BE D(X,B) | BER R | Branch on EQUAL | BC B‘1000’,D(X,B) | BCR B‘1000’,R |
| BNH D(X,B) | BNHR R | Branch on NOT HIGH | BC B‘1101’,D(X,B) | BCR B‘1101’,R |
| BNL D(X,B) | BNLR R | Branch on NOT LOW | BC B‘1011’,D(X,B) | BCR B‘1011’,R |
| BNE D(X,B) | BNER R | Branch on NOT EQUAL | BC B‘0111’,D(X,B) | BCR B‘0111’,R |

**After ARITHMETIC instructions:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Extended Mnemonic | | Meaning | Replaces | |
| RX version | RR version |  | RX version | RR version |
| BP D(X,B) | BPR R | Branch on PLUS | BC B‘0010’,D(X,B) | BCR B‘0010’,R |
| BM D(X,B) | BMR R | Branch on MINUS | BC B‘0100’,D(X,B) | BCR B‘0100’,R |
| BZ D(X,B) | BZR R | Branch on ZERO | BC B‘1000’,D(X,B) | BCR B‘1000’,R |
| BO D(X,B) | BOR R | Branch on OVERFLOW | BC B‘0001’,D(X,B) | BCR B‘0001’,R |
| BNP D(X,B) | BNPR R | Branch on NOT PLUS | BC B‘1101’,D(X,B) | BCR B‘1101’,R |
| BNM D(X,B) | BNMR R | Branch on NOT MINUS | BC B‘1011’,D(X,B) | BCR B‘1011’,R |
| BNZ D(X,B) | BNZR R | Branch on NOT ZERO | BC B‘0111’,D(X,B) | BCR B‘0111’,R |
| BNO D(X,B) | BNOR R | Branch on NOT OVERFLOW | BC B‘1110’,D(X,B) | BCR B‘1110’,R |