

Z80 Routines:Math:Signed Math

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Here come useful routines that handle signed math.

Change Sign

```
;---> negate a
negA:
    neg    ;or: cpl / inc a
```

```
;absolute value of A
AbsA:
    bit 7,a
    ret z
    neg
    ret
```

```
;Input: e - 8-bit signed number
;Output: a - 8-bit signed number
;Sample: abs(-2) = 2; abs(2) = 2
AbsAp:
    ld a,e
    rlca
    sbc a,a ;($FF if signed, $00 if not)
    ld b,a
    xor e
    sub b

;OR
    xor a
    sub e
    jp p,$+4
    ld a,e
```

```
;---> negate hl
;input: hl
;output: hl negated
;destroys a
negHL:
    xor a
    sub l
    ld l,a
    sbc a,a
    sub h
    ld h,a
    ret
```

Extend Sign

```
;a to bc (extend sign)
;inputs:  a - 8-bit signed number
;outputs: bc - same 16-bit signed number
AtoBCextendendsign:
    ld c,a
    rlca          ; or rla
    sbc a,a
    ld b,a
```

```
ret
```

```
; sign-extends e into de
EtoDEextendsign:
    ld a, e
    rlca          ; move sign bit into carry flag
    sbc a, a      ; a is now 0 or 11111111, depending on the carry
    ld d, a
    ret
```

```
; sign-extends de into hlde
DEtoHlDEextendsign:
    ld h, d
    add hl, hl     ; move sign bit into carry flag
    sbc hl, hl     ; hl is now 0 or 11111111 11111111, depending
    ret
```

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Categories: Z80 Routines:Math | Z80 Routines

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