

SUB (immediate)

Subtract (immediate) subtracts an optionally-shifted immediate value from a register value, and writes the result to the destination register.

31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
sf		1	0	1	0	0	0	1	0	sh		imm12										Rn				Rd					
op S																															

op S

32-bit (sf == 0)

SUB <Wd|WSP>, <Wn|WSP>, #<imm>{, <shift>}

64-bit (sf == 1)

SUB <Xd|SP>, <Xn|SP>, #<imm>{, <shift>}

```
integer d = UInt(Rd);
integer n = UInt(Rn);
constant integer datasize = 32 << UInt(sf);
bits(datasize) imm;

case sh of
    when '0' imm = ZeroExtend(imm12, datasize);
    when '1' imm = ZeroExtend(imm12:Zeros(12), datasize);
```

Assembler Symbols

- <Wd|WSP> Is the 32-bit name of the destination general-purpose register or stack pointer, encoded in the "Rd" field.
- <Wn|WSP> Is the 32-bit name of the source general-purpose register or stack pointer, encoded in the "Rn" field.
- <Xd|SP> Is the 64-bit name of the destination general-purpose register or stack pointer, encoded in the "Rd" field.
- <Xn|SP> Is the 64-bit name of the source general-purpose register or stack pointer, encoded in the "Rn" field.
- <imm> Is an unsigned immediate, in the range 0 to 4095, encoded in the "imm12" field.
- <shift> Is the optional left shift to apply to the immediate, defaulting to LSL #0 and encoded in "sh":

sh	<shift>
0	LSL #0
1	LSL #12

Operation

```
bits(datasize) result;  
bits(datasize) operand1 = if n == 31 then SP[]<datasize-1:0> else X[n,  
bits(datasize) operand2;  
  
operand2 = NOT(imm);  
(result, -) = AddWithCarry(operand1, operand2, '1');  
  
if d == 31 then  
    SP[] = ZeroExtend(result, 64);  
else  
    X[d, datasize] = result;
```

Operational information

If PSTATE.DIT is 1:

- The execution time of this instruction is independent of:
 - The values of the data supplied in any of its registers.
 - The values of the NZCV flags.
- The response of this instruction to asynchronous exceptions does not vary based on:
 - The values of the data supplied in any of its registers.
 - The values of the NZCV flags.

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Internal version only: isa v33.64, AdvSIMD v29.12, pseudocode
no_diffs_2023_09_RC2, sve v2023-06_rel ; Build timestamp: 2023-09-18T17:56

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