EXTR

Extract register extracts a register from a pair of registers.
This instruction is used by the alias ROR (immediate).

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	0	0	1	0	0	1	1	1	N	0	Rm	imms	Rn	Rd

32-bit (sf == 0 && N == 0 && imms == 0xxxxx)

```
EXTR <Wd>, <Wn>, <Wm>, #<lsb>
```

64-bit (sf == 1 && N == 1)

```
EXTR <Xd>, <Xn>, <Xm>, #<lsb>
```

```
if N != sf then UNDEFINED;
if sf == '0' && imms<5> == '1' then UNDEFINED;

integer d = UInt(Rd);
integer n = UInt(Rn);
integer m = UInt(Rm);
constant integer datasize = 32 << UInt(sf);
constant integer lsb = UInt(imms);
```

Assembler Symbols

<Wd>	Is the 32-bit name of the general-purpose destination register, encoded in the "Rd" field.
<Wn>	Is the 32-bit name of the first general-purpose source register, encoded in the "Rn" field.
<Wm>	Is the 32-bit name of the second general-purpose source register, encoded in the "Rm" field.
<Xd>	Is the 64-bit name of the general-purpose destination register, encoded in the "Rd" field.
<Xn>	Is the 64-bit name of the first general-purpose source register, encoded in the "Rn" field.
<Xm>	Is the 64-bit name of the second general-purpose source register, encoded in the "Rm" field.
<lsb>	For the 32-bit variant: is the least significant bit position from which to extract, in the range 0 to 31, encoded in the "imms" field.

For the 64-bit variant: is the least significant bit position from which to extract, in the range 0 to 63, encoded in the "imms" field.

Alias Conditions

Alias	Is preferred when
ROR (immediate)	`Rn == Rm`

Operation

```
bits(datasize) result;
bits(datasize) operand1 = X[n, datasize];
bits(datasize) operand2 = X[m, datasize];
bits(2*datasize) concat = operand1:operand2;

result = concat<(lsb+datasize)-1:lsb>;

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.

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