

## CLS (vector)

Count Leading Sign bits (vector). This instruction counts the number of consecutive bits following the most significant bit that are the same as the most significant bit in each vector element in the source SIMD&FP register, places the result into a vector, and writes the vector to the destination SIMD&FP register. The count does not include the most significant bit itself. Depending on the settings in the [CPACR\\_EL1](#), [CPTR\\_EL2](#), and [CPTR\\_EL3](#) registers, and the current Security state and Exception level, an attempt to execute the instruction might be trapped.

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
0	Q	0	0	1	1	1	0	size	1	0	0	0	0	0	0	1	0	0	1	0	Rn				Rd						
U																															

**CLS** <Vd>.<T>, <Vn>.<T>

```
integer d = UInt(Rd);
integer n = UInt(Rn);

if size == '11' then UNDEFINED;
constant integer esize = 8 << UInt(size);
constant integer datasize = 64 << UInt(Q);
integer elements = datasize DIV esize;

CountOp countop = if U == '1' then CountOp_CLZ else CountOp_CLS;
```

## Assembler Symbols

<Vd> Is the name of the SIMD&FP destination register, encoded in the "Rd" field.

<T> Is an arrangement specifier, encoded in "size:Q":

size	Q	<T>
00	0	8B
00	1	16B
01	0	4H
01	1	8H
10	0	2S
10	1	4S
11	x	RESERVED

<Vn> Is the name of the SIMD&FP source register, encoded in the "Rn" field.

## Operation

```

CheckFPAdvSIMDEnabled64();
bits(datasize) operand = V[n, datasize];
bits(datasize) result;

integer count;
for e = 0 to elements-1
    if countop == CountOp\_CLS then
        count = CountLeadingSignBits(Elem[operand, e, esize]);
    else
        count = CountLeadingZeroBits(Elem[operand, e, esize]);
    Elem[result, e, esize] = count<esize-1:0>;
V[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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