

FMINP (vector)

Floating-point Minimum Pairwise (vector). This instruction creates a vector by concatenating the vector elements of the first source SIMD&FP register after the vector elements of the second source SIMD&FP register, reads each pair of adjacent vector elements from the concatenated vector, writes the smaller of each pair of values into a vector, and writes the vector to the destination SIMD&FP register. All the values in this instruction are floating-point values.

When [FPCR.AH](#) is 0, the behavior is as follows for each pairwise operation:

- Negative zero compares less than positive zero.
- When [FPCR.DN](#) is 0, if either element is a NaN, the result is a quiet NaN.
- When [FPCR.DN](#) is 1, if either element is a NaN, the result is Default NaN.

When [FPCR.AH](#) is 1, the behavior is as follows for each pairwise operation:

- If both elements are zeros, regardless of the sign of either zero, the result is the second element.
- If either element is a NaN, regardless of the value of [FPCR.DN](#), the result is the second element.

This instruction can generate a floating-point exception. Depending on the settings in [FPCR](#), the exception results in either a flag being set in [FPSR](#) or a synchronous exception being generated. For more information, see [Floating-point exception traps](#).

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.

It has encodings from 2 classes: [Half-precision](#) and [Single-precision and double-precision](#)

Half-precision (FEAT_FP16)

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	1	0	1	1	1	0	1	1	0	Rm			0	0	1	1	0	1	Rn			Rd								
U								o1																							

FMINP <Vd>.<T>, <Vn>.<T>, <Vm>.<T>

```
if !IsFeatureImplemented(FEAT_FP16) then UNDEFINED;

integer d = UInt(Rd);
integer n = UInt(Rn);
integer m = UInt(Rm);
constant integer esize = 16;
constant integer datasize = 64 << UInt(Q);
```

```
integer elements = datasize DIV esize;

boolean pair = (U == '1');
boolean minimum = (o1 == '1');
```

Single-precision and double-precision

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	1	0	1	1	1	0	1	sz	1	Rm					1	1	1	1	0	1	Rn					Rd				
U										o1																					

FMINP <Vd>.<T>, <Vn>.<T>, <Vm>.<T>

```
integer d = UInt(Rd);
integer n = UInt(Rn);
integer m = UInt(Rm);
if sz:Q == '10' then UNDEFINED;
constant integer esize = 32 << UInt(sz);
constant integer datasize = 64 << UInt(Q);
integer elements = datasize DIV esize;

boolean pair = (U == '1');
boolean minimum = (o1 == '1');
```

Assembler Symbols

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

<T> For the half-precision variant: is an arrangement specifier, encoded in "Q":

Q	<T>
0	4H
1	8H

For the single-precision and double-precision variant: is an arrangement specifier, encoded in "sz:Q":

sz	Q	<T>
0	0	2S
0	1	4S
1	0	RESERVED
1	1	2D

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

<Vm> Is the name of the second SIMD&FP source register, encoded in the "Rm" field.

Operation

```

CheckFPAdvSIMDEnabled64();
bits(datasize) operand1 = V[n, datasize];
bits(datasize) operand2 = V[m, datasize];
bits(datasize) result;
bits(2*datasize) concat = operand2:operand1;
bits(esize) element1;
bits(esize) element2;

for e = 0 to elements-1
    if pair then
        element1 = Elem[concat, 2*e, esize];
        element2 = Elem[concat, (2*e)+1, esize];
    else
        element1 = Elem[operand1, e, esize];
        element2 = Elem[operand2, e, esize];

    if minimum then
        Elem[result, e, esize] = FPMin(element1, element2, FPCR[]);
    else
        Elem[result, e, esize] = FPMax(element1, element2, FPCR[]);

V[d, datasize] = result;

```

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Internal version only: isa v33.64, AdvSIMD v29.12, pseudocode
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