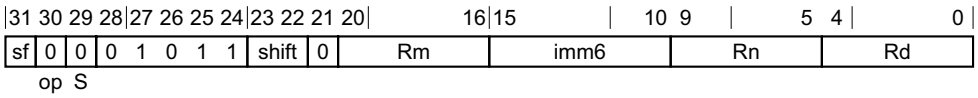
C6.2.5 ADD (shifted register)

Add (shifted register) adds a register value and an optionally-shifted register value, and writes the result to the destination register.



32-bit variant

Applies when `sf == 0`.

```
ADD <Wd>, <Wn>, <Wm>{, <shift> #<amount>}
```

64-bit variant

Applies when `sf == 1`.

```
ADD <Xd>, <Xn>, <Xm>{, <shift> #<amount>}
```

Decode for all variants of this encoding

```
integer d = UInt(Rd);
integer n = UInt(Rn);
integer m = UInt(Rm);
integer datasize = if sf == '1' then 64 else 32;

if shift == '11' then ReservedValue();
if sf == '0' && imm6<5> == '1' then ReservedValue();

ShiftType shift_type = DecodeShift(shift);
integer shift_amount = UInt(imm6);
```

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.

`<shift>` Is the optional shift type to be applied to the second source operand, defaulting to LSL and encoded in the "shift" field. It can have the following values:

- `LSL` when `shift = 00`
- `LSR` when `shift = 01`
- `ASR` when `shift = 10`

The encoding `shift = 11` is reserved.

`<amount>` For the 32-bit variant: is the shift amount, in the range 0 to 31, defaulting to 0 and encoded in the "imm6" field.

For the 64-bit variant: is the shift amount, in the range 0 to 63, defaulting to 0 and encoded in the "imm6" field.

Operation

```
bits(datasize) result;
bits(datasize) operand1 = X[n];
bits(datasize) operand2 = ShiftReg(m, shift_type, shift_amount);

(result, -) = AddWithCarry(operand1, operand2, '0');

X[d] = result;
```