Challenge 50: Negabinary

In base 2, each number can be written using only 0s and 1s. Each digit represents a multiple of a distinct power of 2. For example, we can write the number 23 as

$$23 = 10111_2 \qquad \text{because} \qquad 23 = 1\,(16) + 0\,(8) + 1\,(4) + 1\,(2) + 1\,(1).$$

For example, we can write the numbers 1-10 in base 2 as follows.

$$1 = 1_2$$
$$2 = 10_2$$
$$3 = 11_2$$
$$4 = 100_2$$
$$5 = 101_2$$
$$6 = 110_2$$
$$7 = 111_2$$
$$8 = 1000_2$$
$$9 = 1001_2$$
$$10 = 1010_2$$

In base -2, each number can be written using only 0s and 1s. Each digit represents a multiple of a distinct power of -2. For example, we can write the number 23 as

$$23 = 1101011_2 \qquad \text{because} \qquad 23 = 1\,(64) + 1\,(-32) + 0\,(16) + 1\,(-8) + 0\,(4) + 1\,(-2) + 1\,(1).$$

Write the digits 1-10 in base -2.