**MS Word version of the table**

1. **6-bit floating-point representation**

Fill in the non-negative numbers that can be represented with a 6-bit floating-point format based on the IEEE standard in the table below. The 6-bit format uses 3 exponent bits and 2 significand bits, and one sign bit. Since the exponent is 3 bits, the bias is 23-1-1 = 3.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Description** | **Bit pattern** | **Biased exponent** | **Unbiased exponent** | **Exponent value** | **Significand value** | **Floating-point value** |
| Zero | 0 000 00 | 0 | -2 | 2-2 = 1/4 | 0/4 | 0/16 = 0.0 |
| Denormal values | 0 000 01 | 0 | -2 | 1/4 | 1/4 | 1/16 = 0.0625 |
| 0 000 10 | 0 | -2 | 1/4 | 1/2 | 1/8 = 0.125 |
| 0 000 11 | 0 | -2 | 1/4 | 3/4 | 3/16 = 0.1875 |
| Normal values | 0 001 00 | 1 | -2 | 2-2 = 1/4 | 4/4 | 4/16 = 0.25 |
| 0 001 01 | 1 | -2 | 1/4 | 5/4 | 0.3125 |
| 0 001 10 | 1 | -2 | 1/4 | 6/4 | 0.375 |
| 0 001 11 | 1 | -2 | 1/4 | 7/4 | 0.4375 |
| 0 010 00 | 2 | -1 | 2-1 = 1/2 | 4/4 | 0.5 |
| 0 010 01 | 2 | -1 | 1/2 | 5/4 | 0.625 |
| 0 010 10 | 2 | -1 | 1/2 | 6/4 | 0.75 |
| 0 010 11 | 2 | -1 | 1/2 | 7/4 | 0.875 |
| 0 011 00 | 3 | 0 | 20 = 1 | 4/4 | 4/4 = 1.0 |
| 0 011 01 | 3 | 0 | 1 | 5/4 | 1.25 |
| 0 011 10 | 3 | 0 | 1 | 6/4 | 1.5 |
| 0 011 11 | 3 | 0 | 1 | 7/4 | 1.75 |
| 0 100 00 | 4 | 1 | 21 = 2 | 4/4 | 2.0 |
| 0 100 01 | 4 | 1 | 2 | 5/4 | 2.5 |
| 0 100 10 | 4 | 1 | 2 | 6/4 | 3.0 |
| 0 100 11 | 4 | 1 | 2 | 7/4 | 14/4 = 3.5 |
| 0 101 00 | 5 | 2 | 22 = 4 | 4/4 | 4.0 |
| 0 101 01 | 5 | 2 | 4 | 5/4 | 5.0 |
| 0 101 10 | 5 | 2 | 4 | 6/4 | 6.0 |
| 0 101 11 | 5 | 2 | 4 | 7/4 | 7.0 |
| 0 110 00 | 6 | 3 | 23 = 8 | 4/4 | 8.0 |
| 0 110 01 | 6 | 3 | 8 | 5/4 | 10.0 |
| 0 110 10 | 6 | 3 | 8 | 6/4 | 12.0 |
| 0 110 11 | 6 | 3 | 8 | 7/4 | 56/4 = 14.0 |
| Infinity | 0 111 00 | – | – | – | – | +∞ |
| NaNs | 0 111 01 | – | – | – | – | NaN |
| 0 111 10 | – | – | – | – | NaN |
| 0 111 11 | – | – | – | – | NaN |