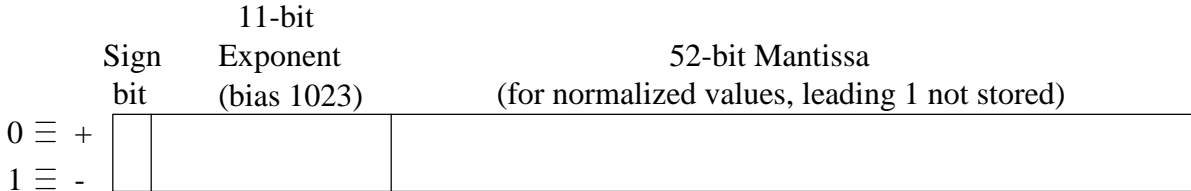
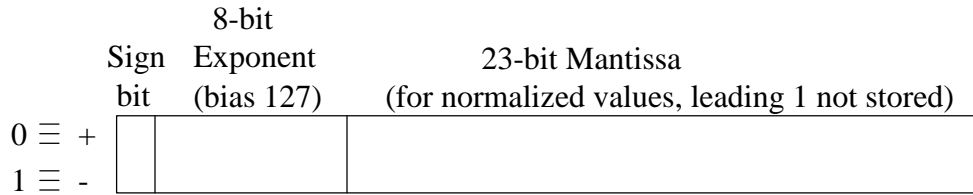


Team #: _____
 Absent: _____

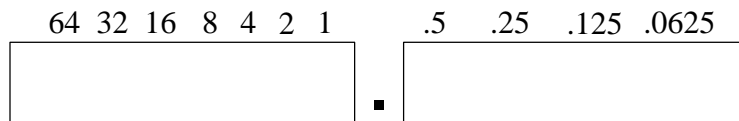
Name: _____

IEEE 754 Standard Floating Point Representation



| Single Precision | | Double Precision | | Object |
|------------------|-----------|------------------|-----------|----------------|
| Exponent | Mantissa | Exponent | Mantissa | Represented |
| 1-254 | any value | 1-2046 | any value | normalized # |
| 0 | 0 | 0 | 0 | 0 |
| 0 | nonzero | 0 | nonzero | denormalized # |
| 255 | 0 | 2,047 | 0 | infinity |
| 255 | nonzero | 2,047 | nonzero | NaN (not a #) |

1) Convert the value 23.625₁₀ to its binary representation.



2) Normalize the above value so that the most significant 1 is immediately to the left of the radix point. Include the corresponding exponent value to indicate the motion of the radix point.

1. × 2

3) Write the corresponding 32-bit IEEE 754 floating point representation for 23.625₁₀.

Team #: _____

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- 4) Write the corresponding 64-bit IEEE 754 floating point representation for 23.625_{10} .

- 5) What would be the smallest positive normalized 32-bit IEEE 754 floating point value?

- 6) How would you add two IEEE 754 floating point numbers?

- 7) How would you multiply two IEEE 754 floating point numbers?

- 8) Consider adding 1.011×2^{40} and 1.01×2^5 .
 - a) How many places does the second number's mantissa get shifted?

 - b) After we add these two numbers and store the results back into a 32-bit IEEE 754 value, what would be the result?