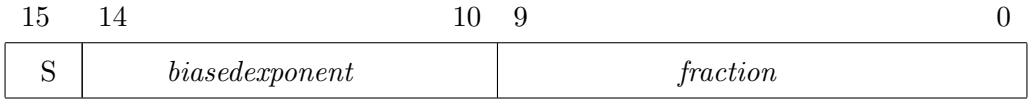
Question 3 (15 points):

A number in a 16-bit floating pointing format is represented as follows: the most significant bit is the sign bit, next there are 5 bits used for the exponent, and 10 bits for the fraction. This format is illustrated below:



The exponent is expressed in excess-16 format (also known as a bias representation). Given the binary representation above, the decimal value of the number represented can be computed by the following expression:

$$N = \begin{cases} (-1)^S \times 0.0 & \text{if } biasedexponent = 0 \text{ and } fraction = 0 \\ (-1)^S \times 0.fraction \times 2^{-14} & \text{if } biasedexponent = 0 \text{ and } fraction \neq 0 \\ (-1)^S \times 1.fraction \times 2^{biasedexponent-15} & \text{if } 0 < biasedexponent < 31 \\ (-1)^S \times \infty & \text{if } biasedexponent = 31 \text{ and } fraction = 0 \\ NaN & \text{if } biasedexponent = 31 \text{ and } fraction \neq 0 \end{cases}$$

1. (**10 points**) Complete the table below with the missing hexadecimal and decimal values for values in this representation.

Hexadecimal	Decimal
	`-8.0625`
`0x0001`	
`0x7C00`	
	$2^{16}-2^5$

2. (**5 points**) In this representation `A = 0x7800` $= 32768_{10}$ and B = 0x4CC0 $= 19_{10}$ Assume a floating-point unit uses the NVIDIA format presented above. This unit has one guard, one round, and one sticky bit. What is the value of $A + B$, expressed in normalized base-two notation, computed by this machine?