Computational Physics HW1 pro3

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Since $f_0 = 2, f_n = f_{n-1}^2$, we have $f_1 = 4, f_2 = 16, \cdots, f_n = 2^{2^n}$. And now each byte can store 4 bits, we can calculate the maximum value for different data types.
a)For int, having 8 bits, the maximum value it can store is $2^7 - 1 < 2^{2^3}$, so the maximum value for f_n is $f_2 = 2^{2^2}$ which means the maximum n is $n = 2$.
b)For long int, having 16 bits, the maximum value it can store is $2^15 - 1 < 2^{2^4}$, so the maximum value for f_n is $f_3 = 2^{2^3}$ which means the maximum n is $n = 3$.
c)For unsigned long int, the maximum value it can store is $2^16 - 1 < 2^{2^4}$, so the maximum value for f_n is the same as the condition in long int and the maximum n is $n = 3$.