1. Given the speed of a current ordinary computer
   (for home or light office use),

estimate the amount of time necessary
to crack a DES encryption by testing all 2^{56}
possible keys. Make a similar estimate for a 128-bit AES key.

Note: For this question, the exact answer is not as important as how the answer was derived. One sample solution is given as below.
We assume that the household computer has a 2GHZ processor. Also we assume that a machine takes a hundred cycles per brute force against a single 56-bit DES key or 128 bit AES key.
To crack a DES encryption, we need:
(2^56 key)*100 cycles/60sec/60min/24hour/365days/2000000000hz = 114.246566 years
To crack a AES encryption, we need:
(2^128 key)*100 cycles/60sec/60min/24hour/365days/2000000000hz = 5.39514154 × 1023 years