Assignment 1

1. In information theory, the **Hamming distance** between two binary strings of equal length is the number of positions at which the corresponding symbols are different. In other words, it measures the minimum number of *substitutions* required to change one binary string into the other. Write a julia program to to calculate the hamming distance between two binary strings.

   The input will be two integers (representing binary strings).

   Sample input:
   5
   3

   Sample Output:
   Hamming distance is 2.

   Explanation:
   5 (in binary, 101)
   3 (in binary, 011)
   5 and 3 have only the last bit in common. The first two bits are different.

2. Starting with any positive integer N, we define the Collatz sequence corresponding to N as the numbers formed by the following operations:

   N → N/2 (if N is even)
   N → 3N + 1 (if N is odd)

   It is conjectured but not yet proven that no matter which positive integer we start with; we always end up with 1.
   For example, Collatz sequence for 10 is 10 → 5 → 16 → 8 → 4 → 2 → 1

   Write a julia program to print the collatz sequence of a number n.

3. **ASCII** abbreviated from **American Standard Code for Information Interchange**, is a character encoding standard for electronic communication. Refer this link for table with ASCII, decimal, hexadecimal, octal and binary values. Write a julia program to convert a string in ASCII to its corresponding hexadecimal format.

   Sample input:
   Given string : “Ash”

Sample output:
Corresponding hexadecimal string is “417368”

Explanation:
Hexadecimal representation of A is 41, s is 73, h is 68 (refer the before mentioned table)