

Assignment 1

Submission date: Wednesday, May 15

Submission Format:

Fork the SummerProjects19 repository. In the forked repository, make a new folder with folder name as your name inside session1. Add the solution code for Assignment 1 questions in this folder (Look at folder Shanthanu for the structure). Then, make a PR to submit your code.

Questions:

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 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:

$N \rightarrow N/2$ (if N is even)

$N \rightarrow 3N + 1$ (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 $10 \rightarrow 5 \rightarrow 16 \rightarrow 8 \rightarrow 4 \rightarrow 2 \rightarrow 1$

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](#))