Assignment 1:

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Solution Description:

The solution consists of 1 file containing java code i-e HammingCode.java.

The program provides the user two options:-

1: Asking the input string for encoding

The program takes the input string for encoding and saves it in a file called Code.txt.

2: Or asking for already existing string to be decoded

Encoding:

void encode(String msg, String filename)

This function takes string and filename as a parameter, it breaks each character of the string into two parts of 4-bits each.

For Example:

0110:001:0010:111

Each character of the message is divided into 4:3:4:3 (splited by colons(:)) using additional **checkParitybits** function.

The generated binary message is then stored in the file Code.txt.

Moreover, the user can also introduce one bit error by writing it in the file Code.txt

Decoding:

void decode(String filename)

This function decodes the encoded string stored in the file Code.txt and calculates the new parity bits of the databits. It compares the results with parity bits in case of different parity bits, the errors are detected and corrected.

The method **fixBinarray,** compares the parity bits, bit by bit and if they are not different a checking string “1” and “0” is created, for differing bits and equal bits respectively. Then the string is matched with a matrix consisting of combination of error and error location.

At the End, after the alteration and flipping of found bits, the function **fixBinarray** returns the correct string consisting of binary digits, that is decoded back again into the characters.