HAMMING CODE

Leader Aim ist endged dading no strant Write a program to implement ever detection and correction using hamming code Concept. Make a test sun to input data stream and verify error correction feature.

Error correction at data link layer!

Hamming code is a set of error. worrection codes that can be used to detect and correct the errors that can own when the daba is transmitted from the sender to the receiver. It is a technique developed by R.W. Hamming for error correction.

Student Observation >

Write the code here!

Sender. py (filename)

import os

def tent-to-binary (tent);

return ". join (format lord cehas), '086') for chas in tent)

des calculate redundant bits (m),

while (2*** r) < (m+r+v):

return

```
def position reduced aut total date, +);
      ms lan (data)
    for 1 & range (1, material)
     The property of sund or whole processed
         resta o page a stan policinal
                 would down all it was
           mes , = data [= 10]
    return res [ : 1 ] ] mande many home,
det calculate parity bits (arr, or);
     m = leu (arr)
   for the range (tr) to be the state of the
      val =0
      for jen range (1, n+1):
        y je (2**i) = (2**i):
          val = val ^ int (arr 1-j ])
     an = an [:n-(2++1)] + str (val) + an [1-(2++1)+
  rebuin arr
def apply hamming code (data):
   m = len (data)
   ~ = calculate_reduped out bits (m)
   arranged data + position redundant bits (data or)
   hanning code - calculate parity - bits larranged das
return hamming code
                       200) 8 $ 2) dull
```

```
def sare to channel (hamming code)
        with open ( channels ', 'w') as file!
           file. write (lamning-code)
    ff_name = = "_Main_";
        tent = input ("Enter the text:")
        binary data 2 text to binary (text)
        hamming_code = apply-hamming_code

Save_to_channel (hamming_code) (binary date)
    # receiver. py
    det read from channel ():
      with open l'chambel, 'r') as tile;
         return file-reade); (motost = 19
   det calculate-redundant bits
       while (2** r) < (m+r+1)
        8+=1 (2**5) = (3**6) 26
                was tong A have I have
  def detect error (au mr)
     n = len (au)
     mes = 0
   for i un range (ur):
                         a of apply havened a
     val = 0
     for jurange (mm), ++1):
       y je (2**i) == (2**i);
        val - val 1 int (an [-j])
    mes = res + val * (10 + + i)
return but (str (res), 2)
```

det correct _ ouron (ser, pas): 4 pos >= 1 monata woomin devices are = are E: bufare J. pos] + ste 11 - int (are Lee loves) weturn art, some al. margare to some det remore redundant bits n = (en corr) of set destination associace j = 0 - Batous of sloon and mage mes = 1,1 for i in range (1, n+1) 4 ("1 = 2 mm j) mes! = Arr I-i]; 1 I] - REVISE !-def binary to text (binary data) tent = 1' for i a range (0, lens (binary-data).0); byte = linery -data [iii+8] mat to the (byte, 2)) geton return test. [(aproposition while from the (level of some) ? for i in source (vivelous right): i Comorphus Its an away for RESULT: () thing Their the hamming Code program is studied and pobserved. 18/9/124