CSE 3024

Web Mining

LAB ASSESSMENT - 3

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1. **Create a Python programme that performs Elias Gamma Encoding and Decoding for even numbers ranging from 1 to 20.**

Ans 1.

HANDWRITTEN CODE:

Q1) VIBHU KUMAR SINGH 19BCE0215

```
from math import log
import math

log2 = lambda x: log(x,2)

def Unary(n):
    return (n-1)*'0'+'1'

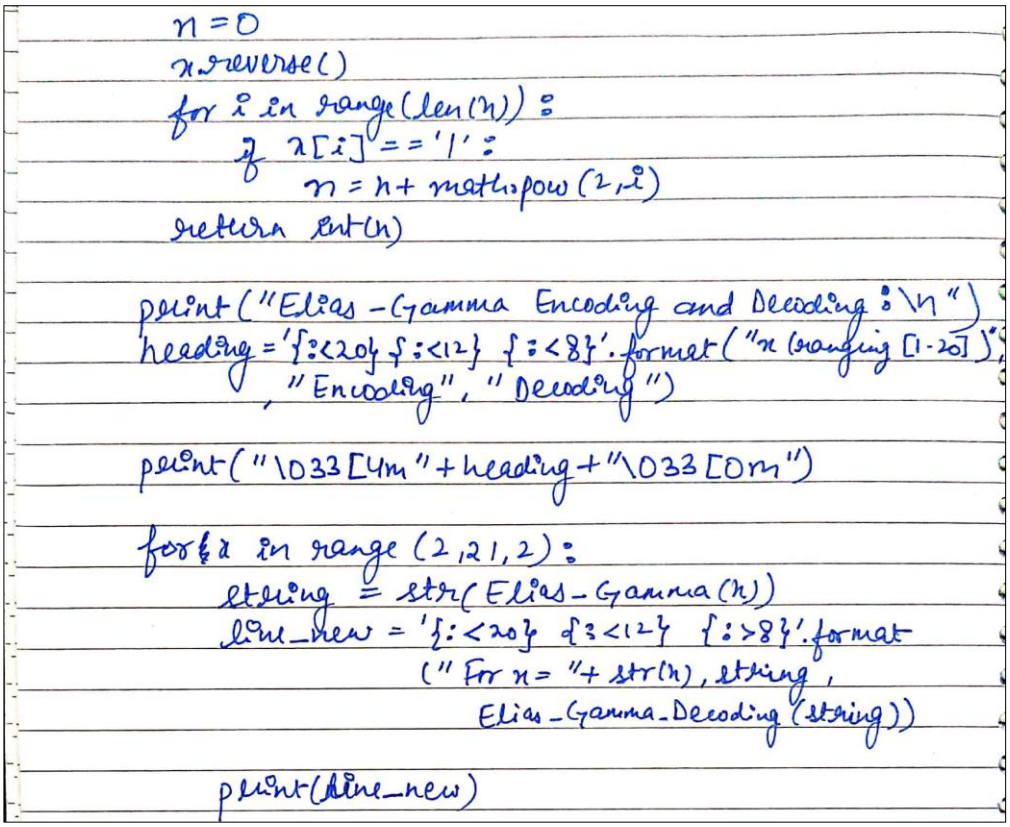
def Binary(n,l=1):
    s = '{0:0%sb}'%l
    return s.format(n)

def Elias_Gamma(n):
    if(n==0):
        return '0'

    n = 1+ int(log2(n))
    b = n - 2**(int(log2(n)))

    l = int(log2(n))
    return Unary(n)+Binary(b,l)

def Elias_Gamma_Decoding(n):
    n = list(n)
    k = 0
    while True:
        if not n[k]=='0':
            break
        k = k+1
    n = n[k:2*k+1]
```



CODE:

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    s = '{0:0%db}' % l
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def Elias_Gamma(x):
    if(x == 0):
        return '0'

    n = 1 + int(log2(x))
    b = x - 2**(int(log2(x)))

    l = int(log2(x))

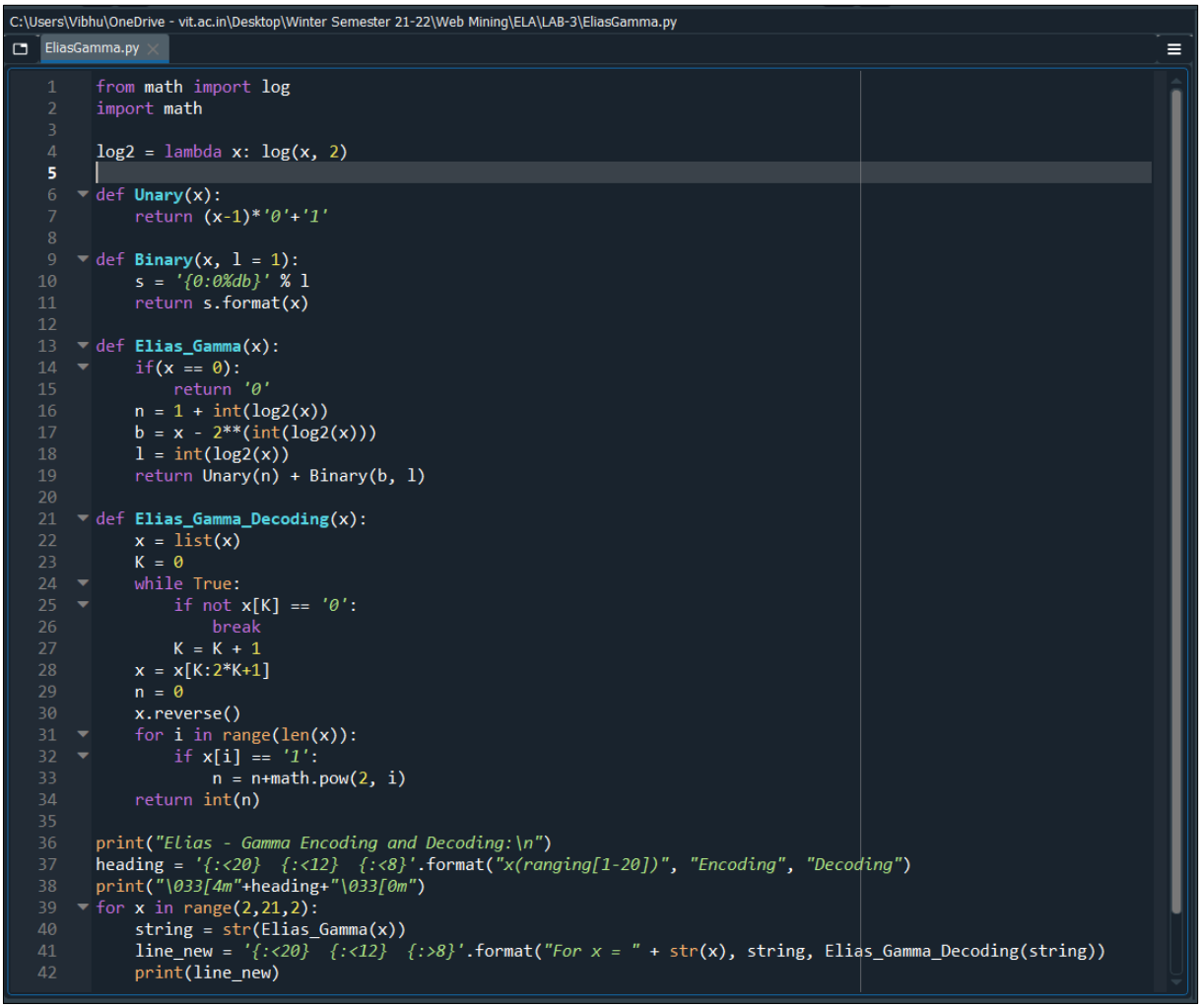
    return Unary(n) + Binary(b, l)

def Elias_Gamma_Decoding(x):
    x = list(x)
    K = 0
    while True:
        if not x[K] == '0':
            break
        K = K + 1
    x = x[K:2*K+1]
    n = 0
    x.reverse()
```

```
    for i in range(len(x)):
        if x[i] == '1':
            n = n+math.pow(2, i)
    return int(n)

print("Elias - Gamma Encoding and Decoding:\n")
heading = '{:<20}  {:<12}  {:<8}'.format("x(ranging[1-20])", "Encoding", "Decoding")
print("\033[4m"+heading+"\033[0m")
for x in range(2,21,2):
    string = str(Elias_Gamma(x))
    line_new = '{:<20}  {:<12}  {:>8}'.format("For x = " + str(x), string,
Elias_Gamma_Decoding(string))
    print(line_new)
```

CODE SCREENSHOT:



(P.T.O)

OUTPUT:

Elias - Gamma Encoding and Decoding:

x(ranging[1-20])	Encoding	Decoding
For x = 2	010	2
For x = 4	00100	4
For x = 6	00110	6
For x = 8	0001000	8
For x = 10	0001010	10
For x = 12	0001100	12
For x = 14	0001110	14
For x = 16	000010000	16
For x = 18	000010010	18
For x = 20	000010100	20

OUTPUT SCREENSHOT: