

Web Mining (CSE3024)

Lab Assignment 4

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Slot: L15+L16

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Question:

Write a python program to perform the following encoding for the ODD numbers between 1 - 30

i) Elias Gamma

ii) Elias Delta

iii) Golomb (b = 10)

Code:

```
#!/usr/bin/python
from math import log,ceil
log2 = lambda x: log(x,2)
def binary(x,l=1):
    fmt = '{0:0%db}' % l
    return fmt.format(x)
def unary(x):
    return x*'1'+'0'
def elias_generic(lencoding, x):
    if x == 0: return '0'
    l = 1+int(log2(x))
    a = x - 2**(int(log2(x)))
    k = int(log2(x))
    return lencoding(l) + binary(a,k)
def golomb(b, x):
    q = int((x) / b)
    r = int((x) % b)
    l = int(ceil(log2(b)))
    #print q,r,l
    return unary(q) + binary(r, l)
def elias_gamma(x):
```

```

        return elias_generic(unary, x)
def elias_delta(x):
    return elias_generic(elias_gamma,x)
print("    i: Elias Gamma: Elias Delta: Golomb")
for i in range(31):
    if(i%2!=0):
        print("%5d: %-10s : %-10s : %-10s" %(i,
elias_gamma(i),elias_delta(i), golomb(10,i)))

```

The screenshot shows a Windows desktop environment. On the left, a text editor window titled 'encoding1.py' displays the following Python code:

```

#!/usr/bin/python
from math import log,ceil

log2 = lambda x: log(x,2)

def binary(x,l=1):
    fmt = '{0:0%db}' % l
    return fmt.format(x)

def unary(x):
    return x*'1'+ '0'

def elias_generic(lencoding, x):
    if x == 0: return '0'

    l = 1+int(log2(x))
    a = x - 2**(int(log2(x)))

    k = int(log2(x))

    return lencoding(l) + binary(a,k)

def golomb(b, x):
    q = int((x) / b)
    r = int((x) % b)

    l = int(ceil(log2(b)))
    #print q,r,l

    return unary(q) + binary(r, l)

def elias_gamma(x):
    return elias_generic(unary, x)

def elias_delta(x):
    return elias_generic(elias_gamma,x)

print("    i: Elias Gamma: Elias Delta: Golomb")

```

On the right, a 'Python 3.7.0 Shell' window shows the output of the script. It displays a table of binary representations for integers 1 through 29, with columns for the integer value and its corresponding Elias Gamma, Elias Delta, and Golomb encodings.

Output:

```

>>>
RESTART: C:/Users/Kritika Mishra/Desktop/5th Semester/Web Mining/Lab/encoding1.
py
    i: Elias Gamma: Elias Delta: Golomb
    1: 100          : 1000          : 00001
    3: 1101         : 11001         : 00011
    5: 111001       : 110101        : 00101
    7: 111011       : 110111        : 00111
    9: 11110001     : 111000001     : 01001
   11: 11110011     : 111000011     : 100001
   13: 11110101     : 111000101     : 100011
   15: 11110111     : 111000111     : 100101
   17: 1111100001   : 1110010001    : 100111
   19: 1111100011   : 1110010011    : 101001
   21: 1111100101   : 1110010101    : 1100001
   23: 1111100111   : 1110010111    : 1100011
   25: 1111101001   : 1110011001    : 1100101
   27: 1111101011   : 1110011011    : 1100111
   29: 1111101101   : 1110011101    : 1101001
>>>

```