Notes for Discrete math UTS midterm exam:

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1. How many subsets are there in a set of T elements?

2T

2. Order the logical operations OR, AND, NOT.

NOT, AND, OR

3. Is this function (0, 0), (1, 1), (4, 2), (9, 3), (4, -2)? Why?

No, because (4, 2) and (4, -2) are not allowed.

4. Compare truth tables of implication, conversion, inversion, contraposition.

Implication = contraposition

Conversion = inversion

5. Calculate number of permutations P(T,L).

$$P\left(T,L\right)=\frac{T!}{\left(T-L\right)!}$$

6. In how many ways you can write the digits of your k?

$P\left(D,D\right)=\frac{D!}{\left(D-D\right)!}= $D!

7. Find Highest Common Divisor and Lowest Common Multiple of e+4 and L+4.

Use minimum and Maximum of powers of the prime factors.

8. Convert T to e+2 and L+2 counting systems.

s = 23123456

T = s mod 100

L = s mod 10

e = s mod 8

n = T

b = L+2

d1 = n Mod b ^ 1

MsgBox d1

d2 = (n Mod b ^ 2 - d1) / b ^ 1

MsgBox d2

d3 = (n Mod b ^ 3 - b ^ 1 \* d2 - d1) / b ^ 2

MsgBox d3

d4 = (n Mod b ^ 4 - b ^ 2 \* d3 - b ^ 1 \* d2 - d1) / b ^ 3

MsgBox d4

d5 = (n Mod b ^ 5 - b ^ 3 \* d4 - b ^ 2 \* d3 - b ^ 1 \* d2 - d1) / b ^ 4

MsgBox d5

d6 = (n Mod b ^ 6 - b ^ 4 \* d5 - b ^ 3 \* d4 - b ^ 2 \* d3 - b ^ 1 \* d2 - d1) / b ^ 5

MsgBox d6

d7 = (n Mod b ^ 7 - b ^ 5 \* d6 - b ^ 4 \* d5 - b ^ 3 \* d4 - b ^ 2 \* d3 - b ^ 1 \* d2 - d1) / b ^ 6

MsgBox d7

'd8 = (n Mod b ^ 8 - b ^ 6 \* d7 - b ^ 5 \* d6 - b ^ 4 \* d5 - b ^ 3 \* d4 - b ^ 2 \* d3 - b ^ 1 \* d2 - d1) / b ^ 7

'MsgBox d8

'd9 = (n Mod b ^ 9 - b ^ 7 \* d8 - b ^ 6 \* d7 - b ^ 5 \* d6 - b ^ 4 \* d5 - b ^ 3 \* d4 - b ^ 2 \* d3 - b ^ 1 \* d2 - d1) / b ^ 8

'MsgBox d9

'd10 = (n Mod b ^ 10 - b ^ 8 \* d9 - b ^ 7 \* d8 - b ^ 6 \* d7 - b ^ 5 \* d6 - b ^ 4 \* d5 - b ^ 3 \* d4 - b ^ 2 \* d3 - b ^ 1 \* d2 - d1) / b ^ 9

'MsgBox d10

Question:

Give prime factorization of s.

9. Calculate the largest prime number you can.

n = 13

For i = 2 To Int(Sqr(n))

If n Mod i = 0 Then GoTo 1

Next i

MsgBox "prime"

GoTo 2

1 MsgBox "not prime"

2 Label2 = 2

10. Give the histogram of tossing L+2 fair coins, the first e+3 digits of π.

0:1

1:1

0:1

1:2

2:1

0:1

1:3

2:3

3:1

 1

 11

 121

1331

3.141592654

0:0

1:2

2:1

3:1

4:2

5:2

6:1

7:0

8:0

9:1

11. Give the histogram of adding random between e+2 times.

Use Excel

12. Solve the Graceful Graph Problem for *(e+3)* vertices.

(0,1), (1,3), (0,3)

(5,6), (0,2), (2,5), (2,6), (0,5), (0,6)

(8,9),(0,2),(2,5),(5,9),(0,5),(2,8),(2,9),(0,8),(0,9)

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