Technische Universität München
Fakultät für Informatik
Lehrstuhl für Effiziente Algorithmen
Sandeep Sadanandan

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Solution Sheet 1
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Python For Fine Programmers

Problem 1 (1 Point)

Write down the binary representation of 76 (Decimal)

Solution

$76 = 64 + 8 + 4 = 1001100$

Problem 2 (1 Point)

Find the value of 2^{16} in 4 multiplications

Solution

$(((2^{2)^{2)^{2)}}$

Problem 3 (1 Point)

If $\log_{10}^{a} = b$, How many digits are there in the decimal representation of a?

Solution

$\log 100 = 2$ and there are three digits.

Problem 4 (1 Point)

If $x = 100101011011$ is a binary number, write down the representation of $2 \cdot x$

Solution

Any decimal number multiplied with 10 just adds a zero to the end. So any binary number multiplied with 2 should...

Problem 5 (1 Point)

How do you convert from Binary to Octal representation?

Solution

Take 3 at a time.

Problem 6 (1 Point)

Square 53 in your head.

Solution

$53^2 = (50 + 3)^2 = 50^2 + 3^2 + 2 \cdot 50 \cdot 3$

Problem 7 (1 Point)

Can you teach someone how to sort a deck of cards? Just think about that.

Solution

....

Problem 8 (1 Point)

Have you heard about Tower of Hanoi? If yes, do you know how to solve TOH of any size?

Solution

Solve the TOH of one lower to the temporary pole; move the bottom disc; now solve the TOH of one lower form temporary to the final one.

Problem 9 (1 Point)

You are the postman/woman of your locality. How would you deliver the posts with least effort / maximum efficiency?

Solution

Minimum Spanning Tree.

Problem 10 (1 Point)

Have you heard about Fibonacci series? Do you know the connection of rabbits and computer science?

Solution

1, 1, 2, 3, 5, 8, 13, 21, 34,
A pair of never to die newborn rabbits in the beginning of a month; who start to reproduce once in a month and pregnancy time is a month and every time a new pair of rabbits (pair = mate-able male and female)

Problem 11 (1 Point)

What is the difference between a Nibble and a Word

Solution

4 bits and 4 bytes