**00009620**

Task 1

<https://github.com/00009620/CSF->

Task 2

a) Convert my ID(9620) into binary code:

|  |  |  |
| --- | --- | --- |
| Division by 2 | Quotient | Remainder |
| 9620/2 | 4810 | 0 |
| 4810/2 | 2405 | 0 |
| 2405/2 | 1202 | 1 |
| 1202/2 | 601 | 0 |
| 601/2 | 300 | 1 |
| 300/2 | 150 | 0 |
| 150/2 | 75 | 0 |
| 75/2 | 37 | 1 |
| 37/2 | 18 | 1 |
| 18/2 | 9 | 0 |
| 9/2 | 4 | 1 |
| 4/2 | 2 | 0 |
| 2/2 | 1 | 0 |
| 1 | 0 | 1 |

Convert 9620 to hexadecimal

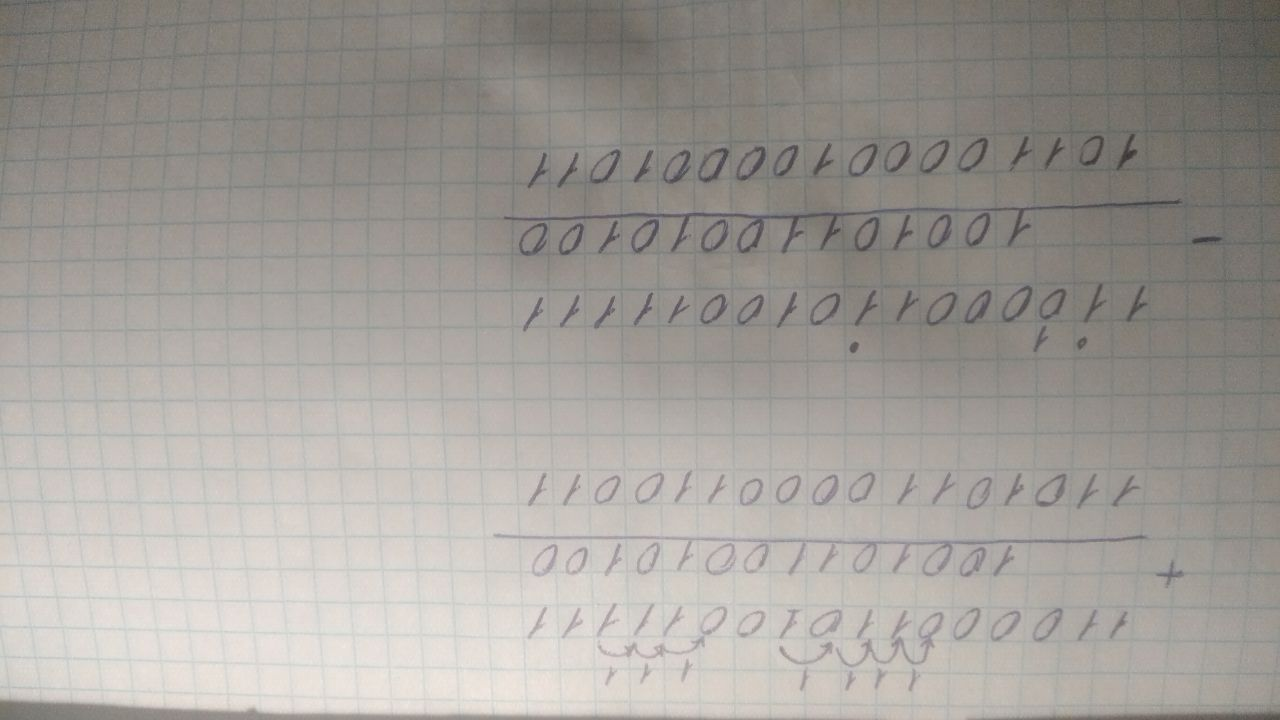
|  |  |  |
| --- | --- | --- |
| Division by 16 | Quotient | Remainder |
| 9620/16 | 601 | 4 |
| 601/16 | 37 | 9 |
| 37/16 | 2 | 5 |
| 2 | 0 | 2 |

Reverse the remainders and get answers.

Answer: 9620 in binary = 10010110010100

9620 in hex = 2594

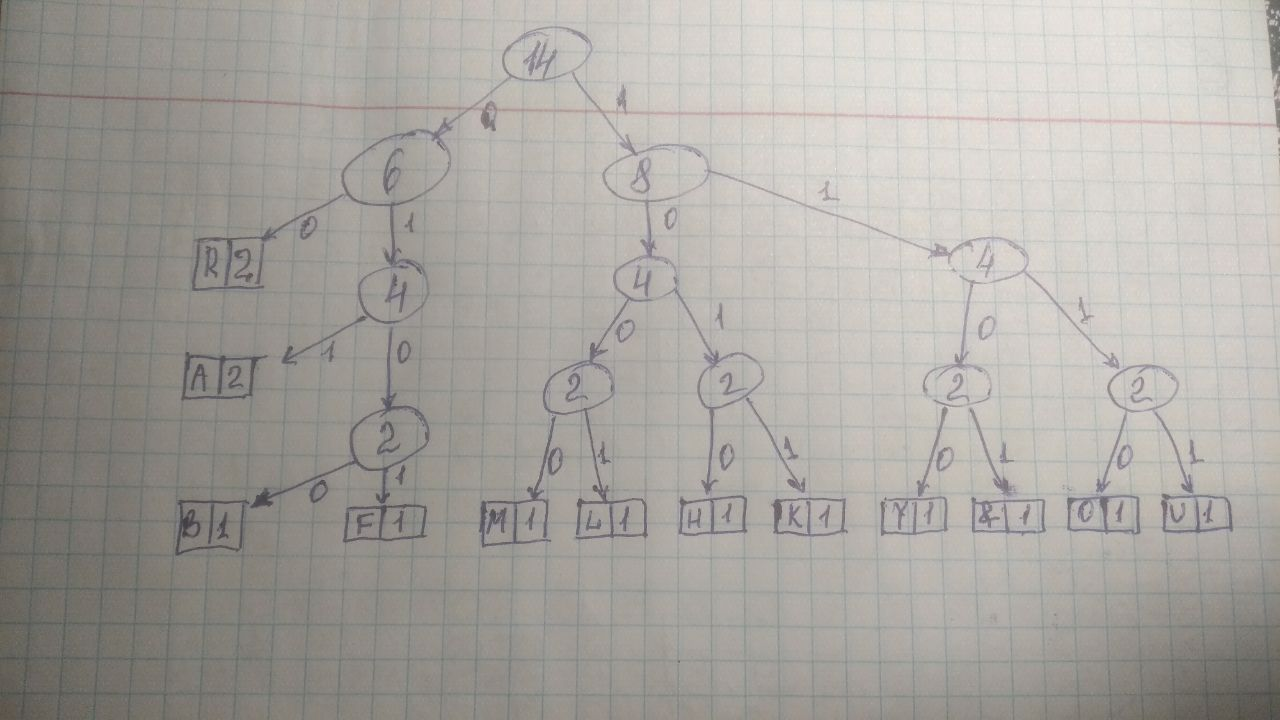
b) 99999 is equal to 11000011010011111 in binary code.

Below are the results of subtraction and addition :

c) Hexadecimal code is most used for space exemption or simply is can hold more numbers of a binary code, using just a couple of digits. So, it is really great in terms of space allocation. The only possible drawback is that it is a bit hard for people to understand it and convert it straightforward to decimal in a head.

Task 3

Let’s depict my parents’ names (BAKHROM&FLYURA) in Huffman’s tree.



Creating table to depict frequency and encoding for each letter:

|  |  |  |
| --- | --- | --- |
| Letters | Frequency | Encoding |
| R | 2 | 00 |
| A | 2 | 011 |
| B | 1 | 0100 |
| F | 1 | 0101 |
| M | 1 | 1000 |
| L | 1 | 1001 |
| H | 1 | 1010 |
| K | 1 | 1011 |
| Y | 1 | 1100 |
| & | 1 | 1101 |
| O | 1 | 1110 |
| U | 1 | 1111 |

Let’s now calculate number of bits that needed to be allocated to store this data:

2\*2+2\*3+1\*4+1\*4+1\*4+1\*4+1\*4+1\*4+1\*4+1\*4+1\*4+1\*4=50bits

Answer: 50bits

Task 4

So, my ID consists of digits 9,6,2,0.

Group them in ascending order:

0,2,2,3,4,5,6,7,9 Let’s Find 3

1)Find midpoint (9/2=4.5=5th value, that is,in turn, = 4)

2) x<4 ,so we ignore all numbers on the right side from 4 (range of {4;9})

3) Find midpoint (4/2= second value , which is equal to 2)

4)x>2 ,therefore we ignore range on the left side {0;2} (What is left ~~0,2~~,2,3,~~4,5,6,7,9)~~

5) Find midpoint (2/2= first value that is equal to 2)

6)x>2,we omit the range on the left side from 2 (once more because numbers are repeated, but in fact these are different numbers in the sequence ,because data is ordered)

7)Only one number left in sequence, check if x=3, yes 3==3, number is found.

Task 5

Given:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Page** | **0** | **1** | **2** | **3** | **4** |
| **Frame** | **4** | **3** | **5** | **6** | **7** |

1. Frame size = 1024 and logical address <2, 85>

Solution: Physical address = Frame(that corresponds to the page)\*Frame size + offset= 5\*1024+85=5205

1. Offset is larger than the page size, so physical address seems to be illegal.

Task 6

DevOps and Waterfall.

DevOps is the SDM that mainly aims to combine two teams: software development (Dev) with operations (Ops), that historically operated on their own. By applying this strategy the main intention is that companies may work together in order to create,test and release projects as fast and as efficient as possible. According to Singaraju, DevOps requires a highly qualified manager in order to run two separate teams properly,otherwise there is highly likely to be an absolute chaos.

Waterfall methodology is a classic way for software development, basically it was the very first to be created among others. Main peculiarities are that it is divided into different phases,that cannot be overlapped. One phase should be 100% be finished in order to move to the next one. It is one of the easiest methodologies to be implemented,but on the other hand it is time consuming,because no working software is produced up to the almost end,when it had gone through all phases. Works pretty good for smaller project,only if requirements are clearly structured.

Task 7

Mesh and Bus topologies

Mesh topology’s main peculiarity is that each device in the network is connected to every other device of the similar network. Meaning that having n-number of devices each device is connected to (n-1) devices in the network.

Advantages:

1. There are almost no traffic issues within the network, because each device is connected to every other
2. The failure of one doesn’t affect other links at all
3. Troubleshooting is really easy

Disadvantages:

1. One of the most expensive topology models to build
2. Amount of cables required to connect all devices is unimaginable

Bus topology – there is just one main cable to which all devices are connected with the use of drop lines. By the reason that all of the data is transmitted through one cable and only in 1 direction, there is limited number of drop lines that can be connected and certainly limited distance the main cable could have.

Advantages:

1. One of the cheapest and easiest topologies to install
2. More than less cables required than those in Mesh topology

Disadvantages:

1. Problematic troubleshooting
2. If main cable fails, then all the network stops working