**Task 2**

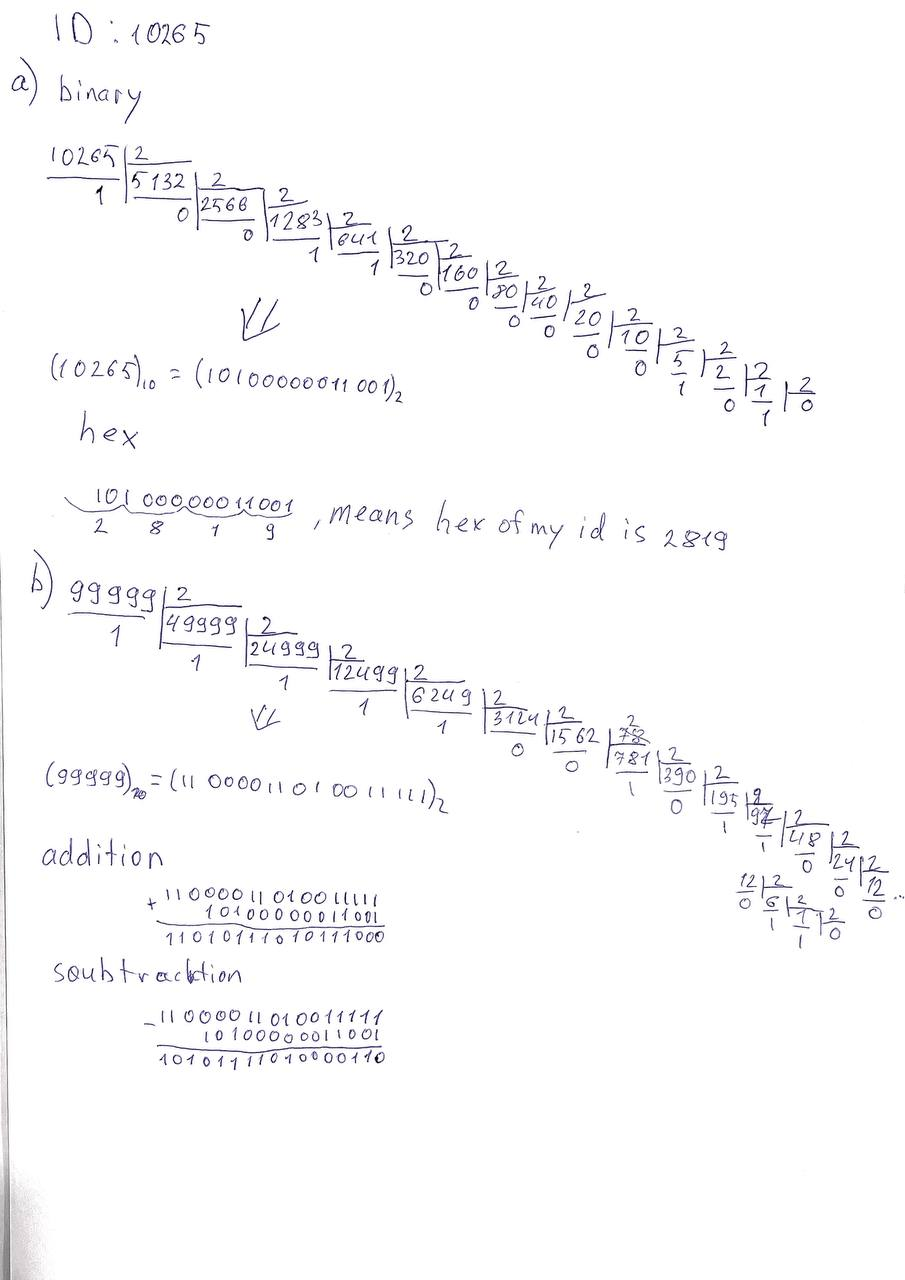
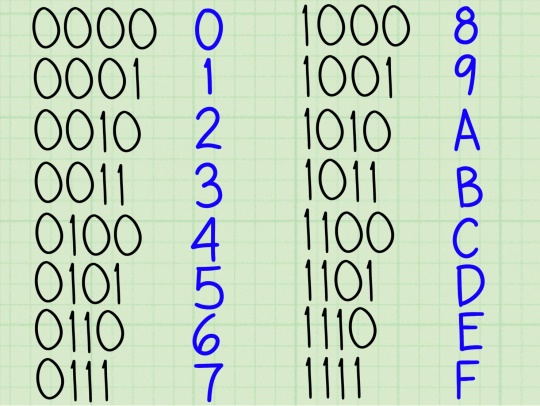
1. My ID is 10265

Binary of my ID is

Using hex-binary table we can find that hex of my id is 2819

Addition => + =

Subtraction => - =



1. Hexadecimal numbers provide better opportunity to use binary numbers in more compact way and therefore are used in Assembly code. In Addition, they represent colors used in HTML and CSS or various symbols in ASCII. They are also used in MAC (Memory Access Control), which is a unique number of a device in the Internet.

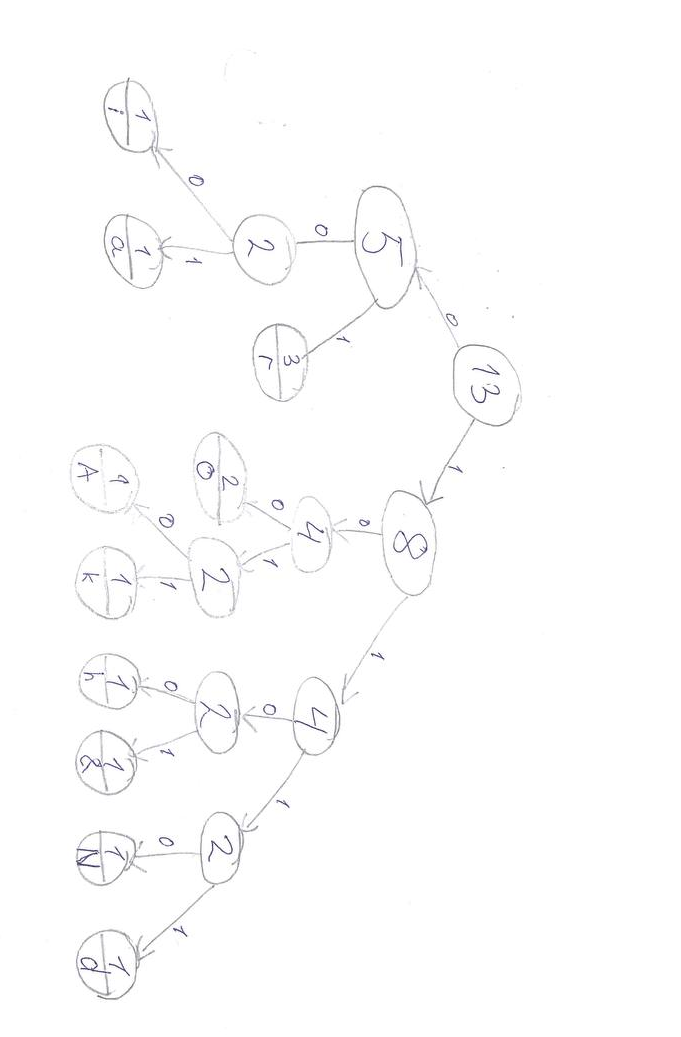
**Task 3**

Father’s name- Akhror

Mother’s name – Nodira

Sentence – Akhror&Nodira

|  |  |  |  |
| --- | --- | --- | --- |
| Symbols | Frequency | Code | Code length |
| r | 3 | 01 | 2 |
| o | 2 | 100 | 3 |
| i | 1 | 000 | 3 |
| a | 1 | 001 | 3 |
| A | 1 | 1010 | 4 |
| k | 1 | 1011 | 4 |
| h | 1 | 1100 | 4 |
| & | 1 | 1101 | 4 |
| N | 1 | 1110 | 4 |
| d | 1 | 1111 | 4 |



The code is 101010111100011000111011110100111100001001

Code length is sum of frequencies times code lengths = 3\*2+2\*3+3+3+4\*6 = 42 bits

**Task 4**

1,0,2,6,5,4,5,2,3,7 => length is 10

Array = 1,0,2,6,5,4,5,2,3,7

1. Sorting the list

REPEAT

Swapped = False

FOR i=0 to length(Array)

IF Array(i)>Array(i+1) THEN

X= Array(i)

Array(i)=Array(i+1)

Arry(i+1)=X

Swapped = True

END IF

NEXT i

UNTIL Swapped = False

Sorted array is = {0,1,2,2,3,4,5,6,7}

Now the pseudocode for the binary search

Highest= HighestBoundary (Array)

Lowest= LowerBoundary (Array)

Do WHILE Lowest <= Highest

Middle= (Lowest+Highest)/2

IF num= Array(Middle) THEN

Found = True

EXIT DO

ELSEIF num< Array(Middle) THEN

Highest=(Middle-1)

ELSE

Lowest = (Missle+1)

END IF

LOOP

If we want to find 6, for example, we go through all this process.

1. The midpoint is 3
2. 6 is larger the 3 therefore left part is gotten rid of and new Lowest is 4
3. Midpoint is 5.5
4. New Lowest is 6
5. Midpoint 6.5
6. New highest is 6
7. Number found

**Task 5**

We have covered three types of memory management techniques: Single Contiguous, Partition Memory, and Paged Memory Management.

Paged Memory Management fractionates memory into parts that are called frames, which can be used by any programs in any order. Unlike this type, Single Contiguous memory management allows division of memory only between OS and application program. This wastes a lot of memory, as the program usually does not need that much memory. Partition memory, meanwhile, also divides memory into parts and allocates them to the programs. However, one advantage of the Paged Memory technique is that contiguous storage in memory is not required. This means, because the process is divided into parts, it is easier to load them rather than loading one large process.

Logical address described as <page, offset>

Physical address = frame\*frame size + offset. Frame size = 1024

1. Frame 2 means page=5

Physical address = 5\*1024+85=5205

1. Invalid offset. It may not be larger than the frame

**Task 6**

Waterfall - the traditional project management methodology – is a linear approach. It usually has five phases- gather requirements, design, code and unit test, system testing , deliver the finished product; a new phase begins only after the previous phase completed.

Agile, in contrast, is not linear, but iterative. Instead of creating plan for the whole project, it divides development work into small increments completed in iterations.

Here are the main differences between the two:

Waterfall – a linear and sequential

Waterfall divides a project into phases

Waterfall is good for one single project

Waterfall aims successful project delivery

Waterfall requires a project manager

Waterfall avoids scope changes after the project has started

Waterfall creates requirements at the start

Agile – incremental and iterative

Agile divides a project into sprints

Agile helps complete many small projects

Agile aims customer satisfaction

Agile enables entire team to manage the project

Agile may introduce changes at any time

Agile prepares requirements along the process

Waterfall methodology is not very popular among companies and mostly used by government organizations and federal agencies. Because it is more customer-oriented, Agile methodology would be more advisable for the companies. Also, it allows to shape your product based on the assessment of each iteration. Only problem may be the funding, because if there is fixed-price scenario, it may increase stress. Nevertheless, this methodology is still better where it is feasible.