**Q)** Write an algorithm to Convert Decimal number to Binary number. By using **Descending Power of 2 and Subtraction** method.

**Please convert (X) = 658 to binary**.

***Hint:***

*How descending power of 2 and subtraction works***:**

Suppose we have to convert (X) = 25 to binary.

According to sample chart below:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| …. | 25 | 24 | 23 | 22 | 21 | 20 |
| …. | 32 | 16 | 8 | 4 | 2 | 1 |
|  |  |  |  |  |  |  |

Find out nearest smaller number and subtract to X so the result will be >=0.

In this case smallest number is 16  
So 25-16 = 9 (mark 24 as 1)

Then find another number, after subtraction result should be >=0.

9 – 8 = 1 (mark 23 as 1)

Now if we minus 4 from 1 result will be <0 so leave this and mark it as 0  
Do these steps until you result will be 0

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| …. | 25 | 24 | 23 | 22 | 21 | 20 |
| …. | 32 | 16 | 8 | 4 | 2 | 1 |
|  |  | 1 | 1 | 0 | 0 | 1 |
|  |  | -16 | -8 |  |  | -1 |

25-16-8-1 binary will be 11001

For number 35 binary will be

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| …. | 25 | 24 | 23 | 22 | 21 | 20 |
| …. | 32 | 16 | 8 | 4 | 2 | 1 |
|  | 1 | 0 | 0 | 0 | 1 | 1 |
|  | -32 |  |  |  | -2 | -1 |

35-32-2-1 binary will be 100011