

Find maximum number that can be formed using digits of a given number

Difficulty Level : Easy • Last Updated : 15 Sep, 2021

Given a number, write a program to find a maximum number that can be formed using all of the digits of this number.

Examples:

Input : 38293367

Output : 98763332

Input : 1203465

Output: 6543210

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Simple Approach: The simple method to solve this problem is to extract and store the digits of the given number in an integer array and sort this array in descending order.

After sorting the array, print the elements of the array.

Time Complexity: $O(N \log N)$, where N is the number of digits in the given number.

Efficient approach : We know that the digits in a number will range from 0-9, so the idea is to create a hashed array of size 10 and store the count of every digit in the hashed array that occurs in the number. Then traverse the hashed array from index 9 to 0 and calculate the number accordingly.

Below is the implementation of above efficient approach:

C++

```
// CPP program to print the maximum number
// from the set of digits of a given number
#include <bits/stdc++.h>
using namespace std;

// Function to print the maximum number
int printMaxNum(int num)
{
    // hashed array to store count of digits
    int count[10] = {0};

    // Converting given number to string
    string str = to_string(num);

    // Updating the count array
    for (int i=0; i<str.length(); i++)
        count[str[i]-'0']++;

    // result is to store the final number
    int result = 0, multiplier = 1;

    // Traversing the count array
    // to calculate the maximum number
    for (int i = 0; i <= 9; i++)
    {
        while (count[i] > 0)
        {
            result = result + (i * multiplier);
            count[i]--;
            multiplier = multiplier * 10;
        }
    }

    // return the result
    return result;
}

// Driver program to test above function
```

```
int main()
{
    int num = 38293367;
    cout << printMaxNum(num);
    return 0;
}
```

Java

```
// Java program to print the maximum number
// from the set of digits of a given number
public class GFG
{
    // Function to print the maximum number
    static int printMaxNum(int num)
    {
        // hashed array to store count of digits
        int count[] = new int[10];

        // Converting given number to string
        String str = Integer.toString(num);

        // Updating the count array
        for(int i=0; i < str.length(); i++)
            count[str.charAt(i)-'0']++;

        // result is to store the final number
        int result = 0, multiplier = 1;

        // Traversing the count array
        // to calculate the maximum number
        for (int i = 0; i <= 9; i++)
        {
            while (count[i] > 0)
            {
                result = result + (i * multiplier);
                count[i]--;
                multiplier = multiplier * 10;
            }
        }

        // return the result
        return result;
    }

    // Driver program to test above function
    public static void main(String[] args)
    {
        int num = 38293367;
        System.out.println(printMaxNum(num));
    }
}
```

// This code is contributed by Sumit Ghosh

Python

```
# Python program to print the maximum number
# from the set of digits of a given number

# Function to print maximum number
def printMaximum(inum):

    # Hashed array to store count of digits
    count = [0 for x in range(10)]

    # Converting given number to string
    string = str(num)

    # Updating the count array
    for i in range(len(string)):
        count[int(string[i])] = count[int(string[i])] + 1

    # Result stores final number
    result = 0
    multiplier = 1

    # traversing the count array
    # to calculate the maximum number

    for i in range(10):
        while count[i] > 0:
            result = result + ( i * multiplier )
            count[i] = count[i] - 1
            multiplier = multiplier * 10

    # return the result
    return result

# Driver code
num = 38293367
print printMaximum(num)

# This code is contributed by Harshit Agrawal
```

C#

```
// C# program to print the maximum number
// from the set of digits of a given number
using System;

class GFG
```

```

{

// Function to print the maximum number
static int printMaxNum(int num)
{
    // hashed array to store
    // count of digits
    int []count = new int[10];

    // Converting given number
    // to string
    String str = num.ToString();

    // Updating the count array
    for(int i = 0; i < str.Length; i++)
        count[str[i] - '0']++;

    // result is to store the
    // final number
    int result = 0, multiplier = 1;

    // Traversing the count array
    // to calculate the maximum number
    for (int i = 0; i <= 9; i++)
    {
        while (count[i] > 0)
        {
            result = result + (i * multiplier);
            count[i]--;
            multiplier = multiplier * 10;
        }
    }

    // return the result
    return result;
}

// Driver Code
public static void Main()
{
    int num = 38293367;
    Console.Write(printMaxNum(num));
}
}

// This code is contributed
// by PrinciRaj1992

```



```
// Php program to print the maximum number
// from the set of digits of a given number

// Function to print the maximum number
function printMaxNum($num)
{
    // hashed array to store count of digits
    $count = array_fill(0,10, NULL);

    // Converting given number to string
    $str = (string)$num;

    // Updating the count array
    for ($i=0; $i<strlen($str); $i++)
        $count[ord($str[$i])-ord('0')]+=;

    // result is to store the final number
    $result = 0;
    $multiplier = 1;

    // Traversing the count array
    // to calculate the maximum number
    for ($i = 0; $i <= 9; $i++)
    {
        while ($count[$i] > 0)
        {
            $result = $result + ($i * $multiplier);
            $count[$i]--;
            $multiplier = $multiplier * 10;
        }
    }

    // return the result
    return $result;
}

// Driver program to test above function

$num = 38293367;
echo printMaxNum($num);
?>
```

Javascript

```
<script>
// Javascript program to print the maximum number
// from the set of digits of a given number

// Function to print the maximum number
function printMaxNum(num)
{
    // hashed array to store count of digits
```

```

let count = new Array(10);
for(let i=0;i<count.length;i++)
{
    count[i]=0;
}

// Converting given number to string
let str = num.toString();

// Updating the count array
for(let i=0; i < str.length; i++)
    count[str[i]-'0']++;

// result is to store the final number
let result = 0, multiplier = 1;

// Traversing the count array
// to calculate the maximum number
for (let i = 0; i <= 9; i++)
{
    while (count[i] > 0)
    {
        result = result + (i * multiplier);
        count[i]--;
        multiplier = multiplier * 10;
    }
}

// return the result
return result;
}

// Driver program to test above function
let num = 38293367;
document.write(printMaxNum(num));

//This code is contributed by avanitrachhadiya2155

```

</script>

Output:



98763332

Time Complexity: $O(N)$, where N is the number of digits in the given number.

Note: For very large numbers we can use strings to take input instead of storing input in integer data type.

Find maximum number that can be formed using digits of a given num...



This article is contributed by **Rohit Thapliyal**. If you like GeeksforGeeks and would like to contribute, you can also write an article using [write.geeksforgeeks.org](https://www.geeksforgeeks.org/write-a-blog/) or mail your article to review-team@geeksforgeeks.org. See your article appearing on the GeeksforGeeks main page and help other Geeks.

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