

Simats C IDE

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SIMATS

Saveetha School of Engineering

Questions  
1/1/2021

Test Cases

write a program that accepts a string from user and displays the same string after removing vowels from it.

Sample Input & Output:  
Enter a string: we can play the game  
The string without vowels is: w cn ply thgn

Run

Save

Logout

```
1 #include<stdio.h>
2 #include<conio.h>
3 int main()
4 {
5     char str[50];
6     int i=0,j,ch;
7     printf("enter the string");
8     gets(str);
9     while(str[i]!='\0')
10    {
11        ch=str[i];
12        if(str[i]!='A' || str[i]!='a' || str[i]!='e' || str[i]!='E' || str[i]!='i' || str[i]!='I' || str[i]!='o' || str[i]!='O' || str[i]!='u' || str[i]!='U')
13        {
14            j=i;
15            while(str[j-1]!='\0')
16            {
17                str[j]=str[j+1];
18                j++;
19            }
20            ch=str[i];
21        }
22        if(ch=='\0')
23            i++;
24        printf("\nstring without vowels:%s",str);
25        return 0;
26    }
```

we can play the game

enter the string  
string without vowels:

87°F  
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Search

ENG  
IN

1:48 PM  
4/10/2023

Questions  
CEQ42.

Test Cases

Write a program to print hollow Rectangle Dollar pattern?

```
1. #include<stdio.h>
2. int main()
3. {
4.     int n=4;
5.     int m=6;
6.     int i,j;
7.     for(i=1;i<=n;i++)
8.     {
9.         for(j=1;j<=m;j++)
10.        {
11.            if(i==1||i==n||j==1||j==m)
12.            {
13.                printf(" $");
14.            }
15.            else
16.            {
17.                printf(" ");
18.            }
19.            printf("\n");
20.        }
21.        return 0;
22.    }
```



# SIMATS

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## Questions

CEQ43

Write a program to find the sum of digits of N digit number.

Sample Input:  
Enter N value : 3  
Enter 3 digit number: 143

Sample Output:  
Sum of 3 digit number: 8

## Test Cases

1. N = 2, 158
2. N = 3, 14
3. N = 4, 0148
4. N = 1, 0004
5. N = 4, 7263

C Run Save

```
1. #include<stdio.h>
2. int main()
3. {
4.     int m,n,sum=0;
5.     printf("enter a value:");
6.     scanf("%d", &n);
7.     printf("\n sum of number:");
8.     scanf("%d", &n);
9.     while(n>0)
10.    {
11.        sum=sum+n%10;
12.        n=n/10;
13.    }
14.    printf("%d",sum);
15.    return 0;
16. }
```

3  
143

enter a value:  
sum of number:8



# SIMATS

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CEQ44

Write a program to find the square root of a perfect square number(print both the positive and negative values)

Sample Input:  
Enter the number : 6561

Sample Output:  
Square Root: 81, -81

## Test Cases

1. 1225
2. 9801
3. 1827
4. -100
5. 0

Run

Save

```
1. #include<stdio.h>
2. #include<math.h>
3. int main()
4. {
5.     float n,s;
6.     printf("\n enter the number:");
7.     scanf("%d", &n);
8.     s=sqrt(n);
9.     printf("\n square root : %f",s);
10.    return 0;
}
```

Questions  
CEQ45

Test Cases

Write a program to print inverted pyramid pattern.

- CEQ45
- CEQ46
- CEQ47
- CEQ48
- CEQ49
- CEQ50
- CEQ51
- CEQ52
- CEQ53
- CEQ54
- CEQ55

C

Run

Save

Logout

```
1. #include<stdio.h>
2. int main()
3. {
4.     int n=4;
5.     int m=6;
6.     int i,j;
7.     for(i=1;i<=n;i++)
8.     {
9.         for(j=1;j<=m;j++)
10.        {
11.            if(i==1||i==n||j==1||j==m)
12.            {
13.                printf(" $");
14.            }
15.            else
16.            {
17.                printf(" ");
18.            }
19.        }
20.        printf("\n");
21.    }
22.    return 0;
23. }
```

Your Input Goes Here....!!!

```
$ $ $ $ $ $
$ $ $ $ $ $
$ $ $ $ $ $
$ $ $ $ $ $
```



Find the LCM and GCD of n numbers?

Sample Input:

N value = 2

Number 1 = 16

Number 2 = 20

Sample Output:

LCM = 80

GCD = 4

1. N = 3, {12, 25, 30}
2. N = 2, {52, 25, 63}
3. N = 3, {17, 19, 11}
4. N = -2, {52, 60}
5. N = 2, {30, 45}

```
1. #include <stdio.h>
2. #include <stdlib.h>
3. #define max 100
4. int main()
5. {
6.     int n,i,ii, product,gcd,lcm,arr[max],j=1;
7.     printf(" How many numbers do you want to enter?\n");
8.     scanf("%d",&n);
9.     for(i=0;i<n;i++)
10.    {
11.        printf(" enter the %d. number: \n",(i+1));
12.        scanf("%d",&arr[i]);
13.    }
14.    gcd = arr[0];
15.    while(j<n)
16.    {
17.        if(arr[j]%gcd==0){
18.            j++; }
19.        else{
20.
21.            gcd=arr[j]%gcd;
22.        }
23.    }
24.    printf("GCD of all numbers is %d \n", gcd);
25.    product=1;
26.    for(ii=0;ii<n;ii++){
27.        product=product*arr[i];
28.    }
29.    lcm=product/gcd;
30.    printf("LCM of all numbers is %d",lcm);
31.    return 0;
32. }
33.
```

2  
16  
20

How many numbers do you want to enter?  
enter the 1. number:  
enter the 2. number:  
GCD of all numbers is 4  
LCM of all numbers is 503362490



## Questions

CEQ6.

Test Case

Write a program to print Right Triangle Star Pattern.

Sample Input:: n = 5

Output:

```
  *
 *
**
***
****
*****
```

C

Run

Save

```
1. #include <stdio.h>
2. int main() {
3.     int i, j, rows;
4.     printf("Enter the number of rows: ");
5.     scanf("%d", &rows);
6.     for (i = 1; i <= rows; ++i) {
7.         for (j = 1; j <= i; ++j) {
8.             printf("* ");
9.         }
10.        printf("\n");
11.    }
12.    return 0;
13. }
```

Questions  
CEQ7.

Write a program to print the below pattern?

```
      1
    1 2
  1 2 3
1 2 3 4
1 2 3 4 5
  4 3
    3 2
      2 1
        1
```

## Test Cases

C

Run

Save

```
1. #include<stdio.h>
2. void main()
3. {
4.     int i,j,n;
5.     printf("input number of rows : ");
6.     scanf("%d", &n);
7.     for(i=0;i<=n;i++)
8.     {
9.         for(j=1;j<=n-i;j++)
10.            printf(" ");
11.         for(j=1;j<=i;j++)
12.            printf("%d",j);
13.         for(j=i;j>=1;j--)
14.            printf("%d", j);
15.         printf("\n");
16.     }
17. }
```

3

```
input number of rows : 1
11
121
1231
```



Questions  
CEQ8

Write a program using function to calculate the simple interest. Suppose the customer is a senior citizen. He is being offered 12 percent rate of interest; for all other customers, the ROI is 10 percent.

Sample Input:  
Enter the principal amount: 200000  
Enter the no of years: 3  
Is customer senior citizen (y/n): n

Sample Output:  
Interest: 60000

## Test Cases

1. Principal: 2000 , Years: 0
2. Principal: 20000 , Years: -2
3. Principal: -2000 , Years: 2
4. Principal: 2 , Years: 2000
5. Principal: 0 , Years: 5

```
1. #include <stdio.h>
2.
3. int main()
4. {
5.     float principle, rate, sinterest;
6.     int time;
7.
8.     printf("Enter Principle Amount, Rate %% per Annum and Time\n");
9.     scanf ("%f %f %d", &principle, &rate, &time);
10.
11.     sinterest = (principle * rate * time)/ 100.0;
12.
13.     printf ("Principle Amount = %f\n", principle);
14.     printf ("Rate %% per Annum = %f\n", rate);
15.     printf ("Time = %d years\n", time);
16.     printf ("Simple Interest = %f\n", sinterest);
17. }
```

200000  
3  
n

Enter Principle Amount, Rate %  
Principle Amount = 200000.00  
Rate % per Annum = 3.00%  
Time = 362419088 years  
Simple Interest = 21745143644

Questions  
CEQS

Write a C Program to Find Even Sum of Fibonacci Series Till number N?

Sample Input: n = 4

Sample Output: 33

(n = 4, So here the Fibonacci series will be produced from 0th term till 8th term: 0, 1, 1, 2, 3, 5, 8, 13, 21  
Sum of numbers at even indexes = 0 + 1 + 3 + 5 + 21 = 33)

## Test Cases

Run

Save

```
1. #include <stdio.h>
2. int calculateEvenSum(int n)
3. {
4.     if (n <= 0)
5.         return 0;
6.     int fibo[2 * n + 1];
7.     fibo[0] = 0, fibo[1] = 1;
8.     int sum = 0;
9.     for (int i = 2; i <= 2 * n; i++) {
10.        fibo[i] = fibo[i - 1] + fibo[i - 2];
11.        if (i % 2 == 0)
12.            sum += fibo[i];
13.    }
14.    return sum;
15. }
16. int main()
17. {
18.     int n = 5;
19.     int sum = calculateEvenSum(n);
20.     printf("Even indexed Fibonacci Sum upto %d terms = %d", n, sum);
21.     return 0;
22. }
```

Your Input Goes Here....!!!

Even indexed Fibonacci Sum upto 5 terms

Questions  
CMQ4

Write a program to print the all Odd numbers and number of even numbers in between M and N?

Sample Input:

M = 6

N = 15

Sample Output:

All Odd Numbers = 7,9,11,13

#### Test Cases

1. M = 100, N = 100
2. M = 500, N = 100
3. M = -5, N = 4
4. M = 72, N = -72
5. M = 0, N = 0

```
1. #include <stdio.h>
2. #include <stdlib.h>
3.
4. int main()
5. {
6.     int num1, num2, r, i;
7.     printf("Enter the first number for the range: ");
8.     scanf("%d", &num1);
9.     printf("Enter the second number for the range: ");
10.    scanf("%d", &num2);
11.    printf("\nDisplay the even numbers between %d and %d are: ", num1, num2);
12.    for(i=num1; i<=num2; i++){
13.        r=i%2;
14.        if(r==0)
15.            printf("\n %d", i); }
16.    printf("\n\nDisplay the odd numbers between %d and %d are: ", num1, num2);
17.
18.    for(i=num1; i<=num2; i++){
19.        r=i%2;
20.        if(r==1)
21.            printf("\n %d", i);
22.    }
23.    getch();
24.    return 0;
25. }
```



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Search



Questions  
CMQS

Write a program to find the number of student users in the college, get the total users, staff users details from the

Sample Input:

Total Users: 856

Staff Users: 126

Sample Output:

Student Users: 688

## Test Cases

1. Total User: 0
2. Total User: -143
3. Total User: 1026, Staff User: 1026
4. Total User: 450, Staff User: 540
5. Total User: 600, Staff User: 450

C Run Save

```
1. #include<stdio.h>
2. int main()
3. {
4.     int total,staff;
5.     scanf("%d",&total);
6.     scanf("%d",&staff);
7.     int non=staff/3;
8.     int stu=total-(non+staff);
9.     printf("%d", stu);
10. }
11.
12.
13.
14.
15.
16.
17.
18.
19.
20.
21.
22.
23.
24.
25.
```

856  
126

688

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Search



Write a program to print the longest word in the below text "Programming does wonders in the world".

```
1. #include <stdio.h>
2. int main()
3. {
4.     int length = 0;
5.     int longestlength = 0;
6.     int endIndex = 0;
7.     int i, j;
8.
9.     char str[100];
10.    char word[100];
11.    printf("Enter a string:\n");
12.    scanf("%s", str);
13.    for (i = 0; str[i] != '\0'; i++)
14.    {
15.        if (str[i] != ' ')
16.        {
17.            length++;
18.            continue;
19.        }
20.
21.        if (length > longestlength)
22.        {
23.            longestlength = length;
24.            endIndex = i;
25.        }
26.
27.        length = 0;
28.    }
29.
30.    if (length > longestlength)
31.    {
32.        longestlength = length;
33.        endIndex = i;
34.    }
35.    j = 0;
36.    for (i = endIndex - longestlength; i < endIndex; i++, j++)
37.    {
38.        word[j] = str[i];
39.    }
40.    word[j] = '\0';
41.    printf("Longest word: %s\n", word);
42.
43.    return 0;
44. }
```

Your Input Goes Here...!!!

Enter a string:  
Longest word: programming

Questions  
CMQ7.

Write a C program to display the subject and mark information using Dynamic Memory Allocation for Structure.

Sample Input:  
Enter the number of records: 2  
Enter subject 1 and marks:  
Science 82  
Enter subject 2 and marks:  
DSA 73

Sample Output :  
Science 82

## Test Cases

Enter the number of records :4 (Any details of subject and marks )  
Enter the number of records :A  
Enter the number of records :1 (CPP 74.5 )  
Enter the number of records :1 (CPP seventy)  
Enter the number of records :1 (233 75)

C

Run

Save

```
1. #include <stdio.h>
2. #include <stdlib.h>
3. struct course {
4.     int marks;
5.     char subject[30];
6. };
7.
8. int main() {
9.     struct course *ptr;
10.    int noOfRecords;
11.    printf("Enter the number of records: ");
12.    scanf("%d", &noOfRecords);
13.
14.    // Memory allocation for noOfRecords structures
15.    ptr = (struct course *)malloc(noOfRecords * sizeof(struct course));
16.    for (int i = 0; i < noOfRecords; ++i) {
17.        printf("Enter subject and marks:\n");
18.        scanf("%s %d", (ptr + i)->subject, &(ptr + i)->marks);
19.    }
20.
21.    printf("Displaying Information:\n");
22.    for (int i = 0; i < noOfRecords; ++i) {
23.        printf("%s\t%d\n", (ptr + i)->subject, (ptr + i)->marks);
24.    }
25.
26.    free(ptr);
27.
28.    return 0;
29. }
```

2  
sci 40  
math 78

Enter the number of records: 2  
Enter subject and marks:  
Displaying Information:  
sci 40  
math 78



Questions  
CHQ4

Write a program to print n prime numbers then find the nth Prime number.

Sample Input:

N = 3

Sample Output:

3rd Prime number is 5

3 prime numbers after 5 are: 7, 11, 13

Test Cases

1. N = P
2. N = 0
3. N = -4
4. N = 11
5. N = 7.2

C

Run

Save

```
1. #include<stdio.h>
2.
3. void main()
4. {
5.     int i,j,n;
6.
7.     printf("Enter the number till which you want prime numbers\n");
8.     scanf("%d",&n);
9.
10.    printf("Prime numbers are:-\n");
11.    for(i=2;i<=n;i++)
12.    {
13.        int c=0;
14.        for(j=1;j<=i;j++)
15.        {
16.            if(i%j==0)
17.            {
18.                c++;
19.            }
20.        }
21.
22.        if(c==2)
23.        {
24.            printf("%d ",i);
25.        }
26.    }
27. }
```

3

Enter the number till which you want  
Prime numbers are:-  
2 3

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Write a program in C to check Armstrong and perfect numbers using the function.

Task Data :  
Input: any number: 371  
Expected Output :  
The 371 is an Armstrong number.  
The 371 is not a Perfect number.

```
1. #include <stdio.h>
2. int checkArmstrong(int n1);
3. int checkPerfect(int n1);
4. int main()
5. {
6.     int n1;
7.     printf("\n\n Function : check Armstrong and perfect numbers :\n\n");
8.     printf("-----\n");
9.     printf("Input any number: ");
10.    scanf("%d", &n1);
11.    if(checkArmstrong(n1))
12.    {
13.        printf("The %d is an Armstrong number.\n", n1);
14.    }
15.    else{
16.        printf("The %d is not an Armstrong number.\n", n1);
17.    }
18.    if(checkPerfect(n1))
19.    {
20.        printf("The %d is a Perfect number.\n\n", n1);
21.    }
22.    else
23.    {
24.        printf("The %d is not a Perfect number.\n\n", n1);
25.    }
26.    return 0;
27. }
28. int checkArmstrong(int n1)
29. {
30.     int ld, sum, num;
31.     sum = 0;
32.     num = n1;
33.     while(num!=0)
34.     {
35.         ld = num % 10;
36.         sum += ld * ld * ld;
37.         num = num/10;
38.     }
39.     return (n1 == sum);
40. }
41. int checkPerfect(int n1)
42. {
43.     int i, sum, num;
44.     sum = 0;
45.     num = n1;
46.     for(i=1; i<num; i++)
47.     {
48.         if(num%i == 0)
49.         {
50.             sum += i;
51.         }
52.     }
53.     return (n1 == sum);
54. }
55. }
```

Your Input Goes Here ...

Your OUTPUT Goes Here ...

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Search



ENG  
IN



Write a program to search the given element using binary search method and display its position in a linear array.

Sample Input:

Array of elements = {16, 18, 27, 16, 23, 21, 19}  
Element to search = 23

Sample Output:

Given element 23 is found at 5 th position

```
1. #include<stdio.h>
2. int main()
3. {
4.     int c, first, last, middle, n, search, array[100];
5.     printf("Enter number of elements\n");
6.     scanf("%d",&n);
7.     printf("Enter %d integers\n", n);
8.     for ( c = 0 ; c < n ; c++ )
9.         scanf("%d",&array[c]);
10.    printf("Enter value to find\n");
11.    scanf("%d",&search);
12.    first = 0;
13.    last = n - 1;
14.    middle = (first+last)/2;
15.    while( first <= last )
16.    {
17.        if ( array[middle] < search )
18.            first = middle + 1;
19.        else if ( array[middle] == search )
20.        {
21.            printf("%d found at location %d.\n", search, middle+1);
22.            break;
23.        }
24.        else
25.            last = middle - 1;
26.        middle = (first + last)/2;
27.    }
28.    if ( first > last )
29.        printf("Not found! %d is not present in the list.\n", search);
30.    return 0;
31. }
32.
33.
34.
```

16  
18  
27  
16  
23  
21  
19

23

Enter number of  
Enter 16 integers  
Enter value to find  
Not found! 13 is



Questions  
CHQ8.

Find the  $M^{\text{th}}$  maximum number and  $N^{\text{th}}$  minimum number in an array and then find the sum of it and difference

Sample Input:

Array of elements = {14, 16, 87, 36, 25, 89, 34}

M = 1

N = 3

Sample Output:

1st Maximum Number = 89

3rd Minimum Number = 25

Sum = 114

Difference = 64

## Test Cases

1. {16, 16, 16, 16, 16}, M = 0, N =
2. {0, 0, 0, 0}, M = 1, N = 2
3. {-12, -78, -35, -42, -85}, M = 3,
4. {15, 19, 34, 56, 12}, M = 6, N =
5. {85, 45, 65, 75, 95}, M = 5, N =

C

Run

Save

```
1. #include <stdio.h>
2.
3.
4.
5. int min(int a,int b)
6. {
7.
8.     int min = a;
9.
10.    if(min > b)
11.
12.        min = b;
13.
14.    return min;
15. }
16.
17.
18. int max(int a,int b)
19. {
20.
21.     int max = a;
22.
23.     if(max < b)
24.
```

Run

Save

```
23.     if(max < b)
24.
25.         max = b;
26.
27.     return max;
28. }
29.
30.
31. int getMin(int arr[], int n)
32. {
33.
34.     int res = arr[0];
35.
36.     for (int i = 1; i < n; i++)
37.
38.         res = min(res, arr[i]);
39.
40.     return res;
41. }
42.
43.
44. int getMax(int arr[], int n)
45. {
46.
47.     int res = arr[0];
48.
49.     for (int i = 1; i < n; i++)
50.
51.         res = max(res, arr[i]);
52.
53.     return res;
54. }
55.
56.
57.
58. int findSum(int arr[], int n)
```

I

Run

Save

```
58. int findSum(int arr[], int n)
59. {
60.
61.     int min = getMin(arr, n);
62.
63.     int max = getMax(arr, n);
64.
65.
66.     return min + max;
67. }
68.
69.
70.
71. int findProduct(int arr[], int n)
72. {
73.
74.     int min = getMin(arr, n);
75.
76.     int max = getMax(arr, n);
77.
78.
79.     return min * max;
80. }
81.
82.
83.
84. int main()
85. {
86.
87.     int arr[] = { 12, 1234, 45, 67, 1 };
88.
89.     int n = sizeof(arr) / sizeof(arr[0]);
90.
91.
92.
93.
94.     printf("Sum = %d\n", findSum(arr, n));
```

87°F

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```
76.     int max = getMax(arr, n);
77.
78.
79.     return min * max;
80. }
81.
82.
83.
84. int main()
85. {
86.
87.     int arr[] = { 12, 1234, 45, 67, 1 };
88.
89.     int n = sizeof(arr) / sizeof(arr[0]);
90.
91.
92.
93.
94.     printf("Sum = %d\n", findSum(arr, n));
95.
96.
97.
98.
99.
100.    printf("Product = %d\n", findProduct(arr, n));
101.
102.    return 0;
103. }
```

Questions  
CHQ6

In an organization they decide to give bonus to all the employees on New Year. A 5% bonus on salary is given to the grade A workers and 10% bonus on salary to the grade B workers. Write a program to enter the salary and grade of the employee. If the salary of the employee is less than \$10,000 then the employee gets an extra 2% bonus on salary. Calculate the bonus that has to be given to the employee and print the salary that the employee will get.

Sample Input & Output:

Enter the grade of the employee: B

Enter the employee salary: 50000

Salary=50000

Bonus=5000 A

C

Run

Save

```
1. #include<stdio.h>
2.
3. #include<string.h>
4.
5. int main()
6. {
7.
8.
9.     int i,j;
10.
11.     float salary,bonus;
12.
13.     char gender;
14.
15.     printf("Enter M for Male and F for Female\n");
16.
17.     scanf("%c",&gender);
18.
19.     printf("Enter Salary\n");
20.
21.     scanf("%f",&salary);
22.
23.     if(gender=='M' || gender=='m')
24.     {
25.
26.
27.         if(salary>10000)
28.
29.             bonus=(float)(salary*0.05);
30.
31.         else
32.
33.             bonus=(float)(salary*0.07);
34.
35.     }
36.
37.     if(gender=='F' || gender=='f')
38.     {
39.
40.
41.         if(salary>10000)
42.
43.             bonus=(float)(salary*0.1);
44.
45.         else
46.
47.             bonus=(float)(salary*0.12);
48.
49.     }
50.
51.     salary+=bonus;
52.
53.     printf("Bonus$%.2f\nSalary=$%.2f\n",bonus,salary);
54.
55. }
```



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CMQ8.

Write a C program to display the details of student(Name , Age) by passing structures to a function.

Sample Input :

Enter No.Students: 1

Enter student 1 Name, Age :AAA, 25

Sample Output:

Student 1 details:

Name: AAA

Age : 25

C



Run

Save

```
1. #include<stdio.h>
2. struct student
3. {
4.     int age;
5.     char name[25];
6. }
7. stud[100];
8. void main()
9. {
10.     int i,n;
11.     printf("enter the no of students\n");
12.     scanf("%d",&n);
13.     printf("enter student info as name,age");
14.     for(i=0;i<n;i++)
15.     {
16.         scanf("%s %d\n",stud[i].name,&stud[i].age);
17.     }
18.     printf("\nNAME\t\tAGE\t\n");
19.     for(i=0;i<n;i++)
20.     {
21.         printf("%s %d\n",stud[i].name,stud[i].age);
22.     }
23. }
```



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