

ព្រះរាជាណាចក្រកម្ពុជា
ជាតិ សាសនា ព្រះមហាក្សត្រ

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The lesson taking about basic of array.

TP8-Use array

TP: Algorithm and Programming

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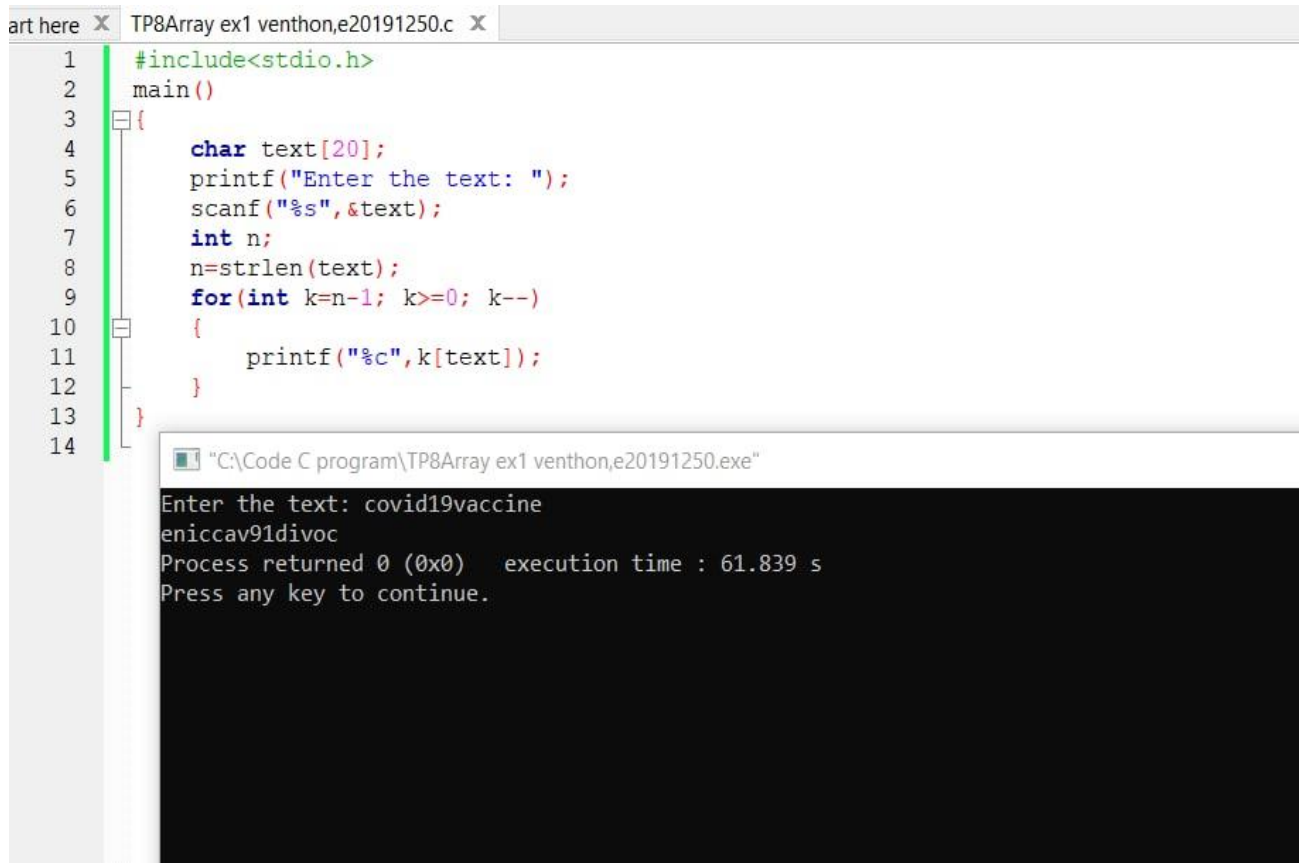
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Problem1:

Write a program which displays the letters in a string (sequence of character / array of character / char array) in reverse order. The program ask a user for a string.

E.g: Input: covid19 vaccine

=> Output: eniccav 91divoc



The image shows a screenshot of a C program in a text editor and its execution in a command prompt. The code in the editor is as follows:

```
1  #include<stdio.h>
2  main()
3  {
4      char text[20];
5      printf("Enter the text: ");
6      scanf("%s",&text);
7      int n;
8      n=strlen(text);
9      for(int k=n-1; k>=0; k--)
10     {
11         printf("%c",k[text]);
12     }
13 }
14
```

The command prompt window shows the execution of the program:

```
"C:\Code C program\TP8Array ex1 venthon,e20191250.exe"
Enter the text: covid19vaccine
eniccav91divoc
Process returned 0 (0x0)   execution time : 61.839 s
Press any key to continue.
```

Problem2:

Write a program to fill data in the 2D (two-dimensional) array as the following.

```
1  2  3  4  5
6  7  8  9 10
11 12 13 14 15
16 17 18 19 20
21 22 23 24 25
```

```
int m[5][5];
```

Then make your program to be able to:

- Display all data above.
- Display the data in reverse order for each row.
- Sum all data in the 2D array and display the sum.

E.g output of b)

```
5  4  3  2  1
10 9  8  7  6
15 14 13 12 11
20 19 18 17 16
25 24 23 22 21
```

The screenshot shows a C++ IDE with two windows. The left window displays the source code for a program that fills a 5x5 array, prints it, prints it in reverse order for each row, and calculates the sum of all elements. The right window shows the output of the program, which matches the expected results from the problem statement.

```
#include<stdio.h>
main()
{
    int m[5][5];
    int counter=0;
    printf("\tDisplay all Data.\n");
    for(int i=0; i<5; i++)
    {
        for(int j=0; j<5; j++)
        {
            counter++;
            m[i][j]=counter;
            printf("\t\t%d ",m[i][j]);
            if(m[i][j]%5==0)
            {
                printf("\n");
            }
        }
    }
    printf("\n\tDisplay the data reverse order for each row.\n");
    for(int k=0; k<5; k++)
    {
        for(int l=4; l>=0; l--l)
        {
            if(m[k][l]%5==0)
            {
                printf("\n");
            }
            printf("\t\t%d ",m[k][l]);
        }
    }
    int sum=0;
    for(int idx=0; idx<5; idx++)
    {
        for(int index=0; index<5; index++)
        {
            sum+=m[idx][index];
        }
    }
    printf("\n\tSummation all data in the 2D array and display the sum: %d",sum);
}
```

Display all Data.

```
1    2    3    4    5
6    7    8    9    10
11   12   13   14   15
16   17   18   19   20
21   22   23   24   25
```

Display the data reverse order for each row.

```
5    4    3    2    1
10   9    8    7    6
15   14   13   12   11
20   19   18   17   16
25   24   23   22   21
```

Summation all data in the 2D array and display the sum: 325

Process returned 0 (0x0) execution time : 0.026 s
Press any key to continue.

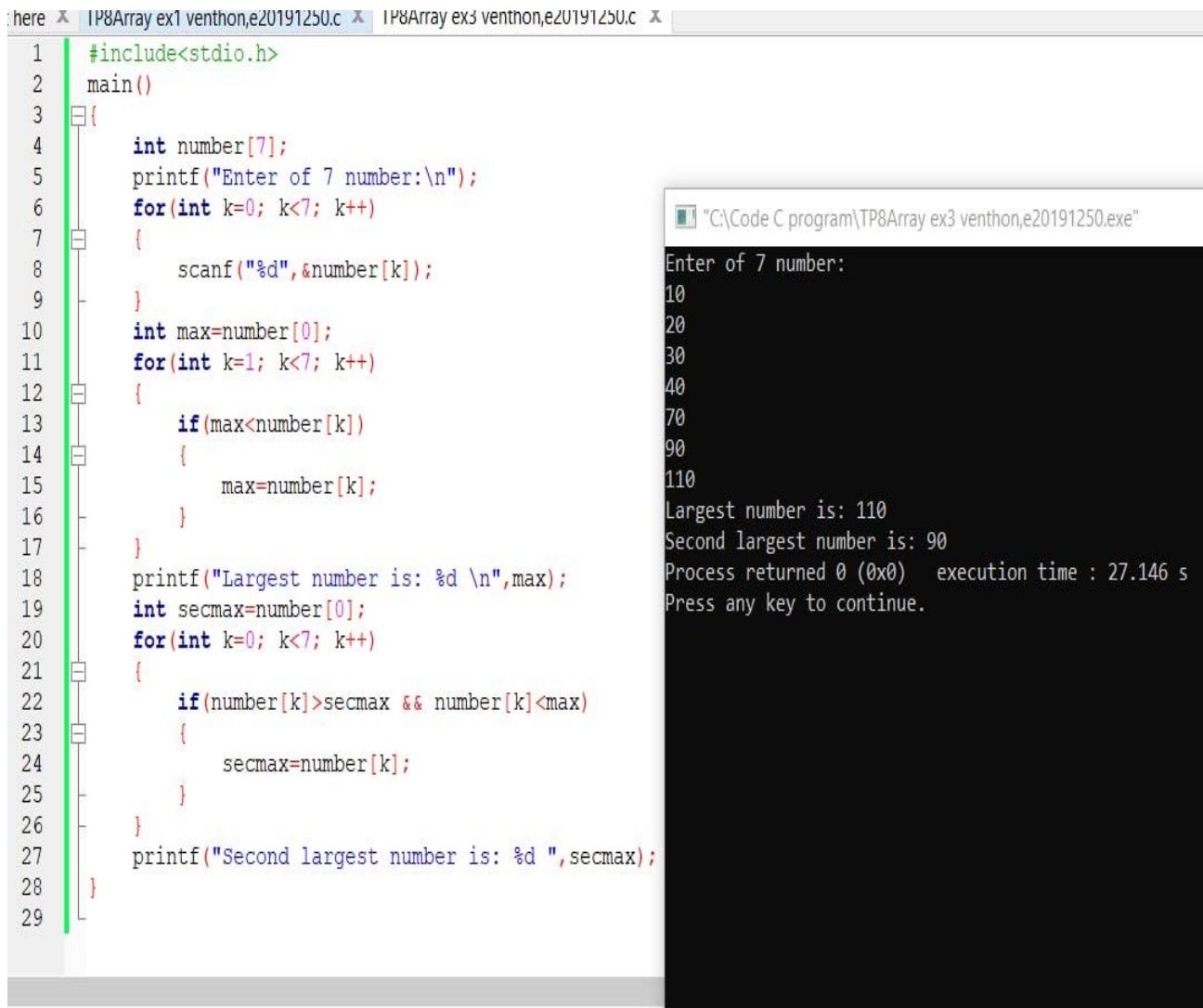
Problem3:

Write a C program to ask a user to input 7 numbers and store in an array. Find largest and second largest element in an array.

E.g 20 10 9 80 -9 3 80

largest: 80

second largest: 20



The image shows a screenshot of a C program being edited in a text editor and its execution output in a separate window. The code is as follows:

```
1  #include<stdio.h>
2  main()
3  {
4      int number[7];
5      printf("Enter of 7 number:\n");
6      for(int k=0; k<7; k++)
7      {
8          scanf("%d",&number[k]);
9      }
10     int max=number[0];
11     for(int k=1; k<7; k++)
12     {
13         if(max<number[k])
14         {
15             max=number[k];
16         }
17     }
18     printf("Largest number is: %d \n",max);
19     int secmax=number[0];
20     for(int k=0; k<7; k++)
21     {
22         if(number[k]>secmax && number[k]<max)
23         {
24             secmax=number[k];
25         }
26     }
27     printf("Second largest number is: %d ",secmax);
28 }
29
```

The execution window shows the following output:

```
"C:\Code C program\TP8Array ex3 venthon,e20191250.exe"
Enter of 7 number:
10
20
30
40
70
90
110
Largest number is: 110
Second largest number is: 90
Process returned 0 (0x0)   execution time : 27.146 s
Press any key to continue.
```

Problem4:

Write a C program to search an element in an array, say myArray. The program ask the user to input 8 numbers (each number is in between 1 to 9) and store in an array.

Then ask the user to input another number, say n. The program searches for the position of n in myArray and display how many n are appearing in myArray and its positions.

E.g 7 8 9 4 7 6 1 1

n: 1

=> There are 2 times in array.

They are located in positions 6 and 7.

The image shows a screenshot of a C program being edited in a text editor and its execution output in a separate window.

Code Editor (Left):

```
1 #include<stdio.h>
2 main()
3 {
4     int num[8],k,index[8],time=0;
5     printf("Enter of 8 number:\n");
6     for(int i=0; i<8; i++)
7     {
8         scanf("%d",&num[i]);
9     }
10    printf("Enter k:\n");scanf("%d",&k);
11    int j;
12    for(int i=0; i<8; i++)
13    {
14        if(k==num[i])
15        {
16            index[j]=i;
17            time=time+1;
18            j++;
19        }
20    }
21    printf("\nThe number %d are %d tmies.\n",k,time);
22    printf("They are located in position: ");
23    for(int i=0; i<time; i++)
24    {
25        printf("%d ",index[i]);
26    }
27 }
28
29
```

Execution Window (Right):

"C:\Code C program\TP8Array ex4 venthon,e20191250.exe"

```
Enter of 8 number:
1
2
3
4
5
6
7
7
Enter k:
7

The number 7 are 2 tmies.
They are located in position: 6 7
Process returned 0 (0x0)   execution time : 74.377 s
Press any key to continue.
```

Bottom Bar:

logs & others

Search results X Cccc X Build log X Build messages X CppCheck

File Time Message

Problem5:

Randomize 9 numbers and store in the two 3x3 matrices, say m1 and m2. Each matrix is a 2D array of 3 rows and 3 columns.

int m1[3][3], m2[3][3];

a) Find the matrix m3 which is the summation of these two matrices. ($m3 = m1 + m2$)

b) Find and display the max and min numbers in m3.

c) Find and display the average in m3 (find sum of all numbers, then divide by 9)

The screenshot shows a C program in a code editor and its execution output in a console window. The code generates two 3x3 matrices, m1 and m2, using random numbers between 1 and 100. It then calculates the sum matrix m3, finds the maximum and minimum values in m3, and calculates the average. The console output displays the matrices and the results of these calculations.

```
1 #include<stdio.h>
2 #include<time.h>
3 main()
4 {
5     int m1[3][3], m2[3][3], m3[3][3];
6     int max=100, min=1;
7     srand(time(0));
8
9     for(int i=0; i<3; i++)
10     {
11         for(int j=0; j<3; j++)
12         {
13             int n;
14             n=rand()%max+min;
15             m1[i][j]=n;
16         }
17     }
18     printf("m1 is equal:\n");
19     for(int i=0; i<3; i++)
20     {
21         for(int j=0; j<3; j++)
22         {
23             printf("%d\t", m1[i][j]);
24         }
25         printf("\n");
26     }
27     printf("\n");
28     for(int i=0; i<3; i++)
29     {
30         for(int j=0; j<3; j++)
31         {
32             int n;
33             n=rand()%max+min;
34             m2[i][j]=n;
35         }
36     }
37     printf("m2 is equal:\n");
38     for(int i=0; i<3; i++)
39     {
40         for(int j=0; j<3; j++)
41         {
42             printf("%d\t", m2[i][j]);
43         }
44         printf("\n");
45     }
46     //sum of m1 and m2
47     for(int i=0; i<3; i++)
```

Execution Output:

```
m1 is equal:
5      91      36
97     21      43
99     2       78

m2 is equal:
51     22      41
89     10      15
88     59      14

m3=m1+m2 is equal:
56     113     77
186    31      58
187    61      92

the largest number in m3 is: 187

the smallest number in m3 is: 31

the average number in m3 is: 95

Process returned 0 (0x0)   execution time : 0.030 s
Press any key to continue.
```