

Institute of technology of Cambodia

Department of Information and communication Engineering



The lesson taking about basic of loop and prime numbers

TP5-Loop (for loop while loop and do while loop)

TP: Algorithm and Programming

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Problem1: A program to get st and en from a user,
where st is a starting number and en is an ending number.
Find summation and multiplication of numbers from st to en.

st: 2

en: 5

SUM: 2+3+4+5=?

MULTIPLY: 2*3*4*5=?

The image shows a code editor window with a file named 'P01.c' and a terminal window displaying the program's execution. The code in 'P01.c' is a C program that prompts the user for a starting number 'st' and an ending number 'en'. It then calculates the sum of numbers from 'st' to 'en' using a for loop and a variable 'sum'. It also calculates the multiplication of numbers from 'st' to 'en' using a for loop and a variable 'mul'. The program uses 'printf' and 'scanf' for input and output. The terminal output shows the user entering '2' for 'st' and '5' for 'en'. The program then displays the sum '2 + 3 + 4 + 5 = 14' and the multiplication '2 * 3 * 4 * 5 = 120'. The terminal also shows the process returning 0 (0x0) and the execution time being 5.623 s. The prompt 'Press any key to continue.' is visible at the bottom of the terminal window.

```
1  #include<stdio.h>
2  main() {
3
4      int st,en,sum,mul;
5      printf("Enter number of st: ");scanf("%d",&st);
6      printf("Enter number of en: ");scanf("%d",&en);
7
8      int k;
9      printf("sum:");
10     for(k=st; k<=en; k=k+1){
11         if(k==en){
12             printf("%d ",k);
13         }
14         else{
15             printf("%d +",k);
16         }
17         sum=sum+k;
18     }
19     printf("= %d ",sum);
20
21     int i;
22     printf("\n\nMul:");
23     for(i=st; i<=en; i=i+1){
24         if(i==en){
25             printf("%d ",i);
26         }
27         else{
28             printf("%d *",i);
29         }
30         mul=mul*i;
31     }
32     printf("= %d ",mul);
33 }
34
```

Select "C:\Code C program\P01.exe"

Enter number of st: 2
Enter number of en: 5
sum:2 +3 +4 +5 =14
Mul:2*3*4*5 =120
Process returned 0 (0x0) execution time : 5.623 s
Press any key to continue.

Problem2- Write a C program to get numbers, say m and n, from a user.

Display numbers in between [m, n] on screen using 'for' loop, 'while loop', and 'do while' loop.

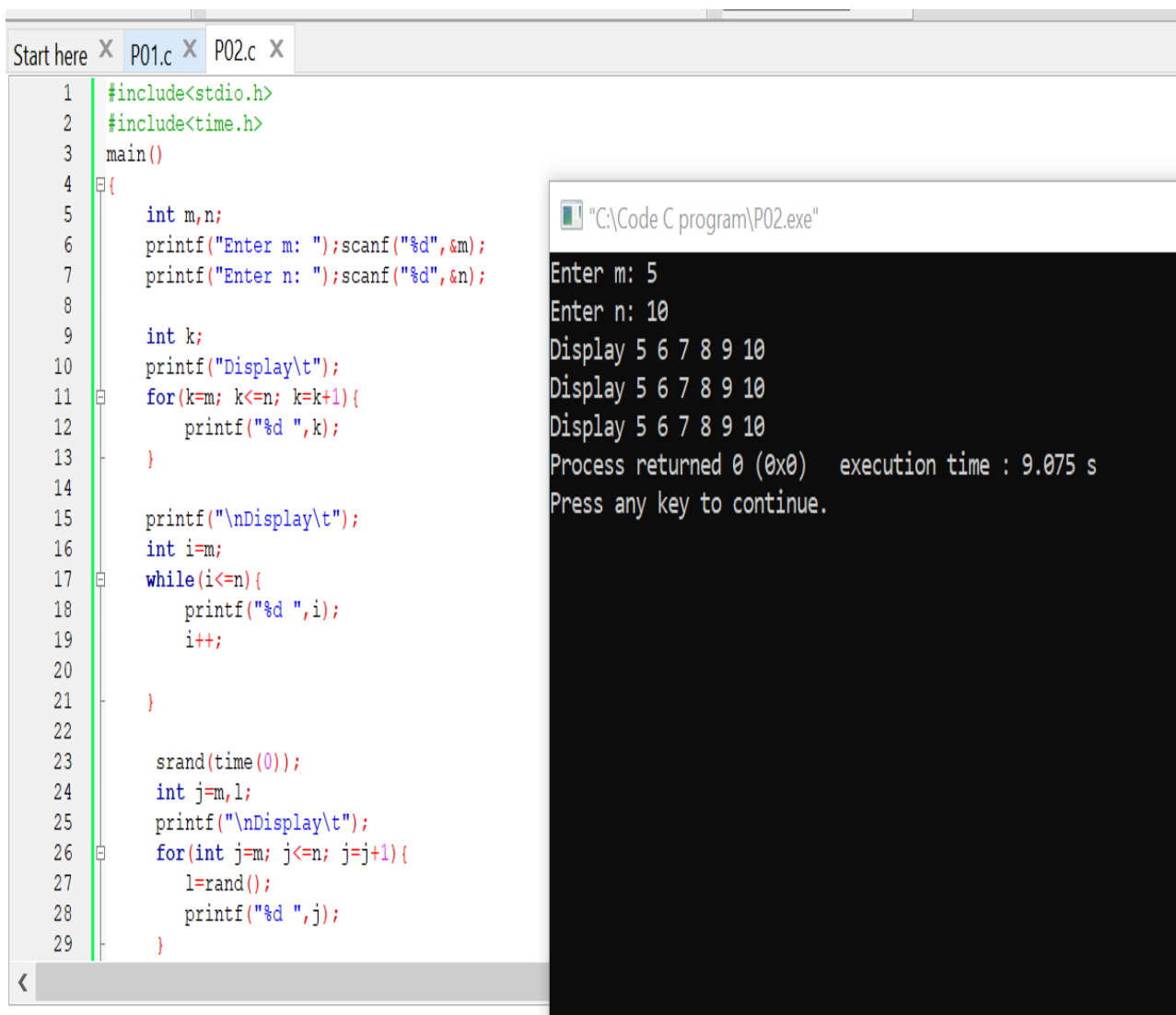
m: 5

n: 100

=> Display 5 6 7 8 ... 100

=> Display 5 6 7 8 ... 100

=> Display 5 6 7 8 ... 100



The screenshot shows a C program editor with three tabs: 'Start here', 'P01.c', and 'P02.c'. The 'P02.c' tab is active, displaying the following code:

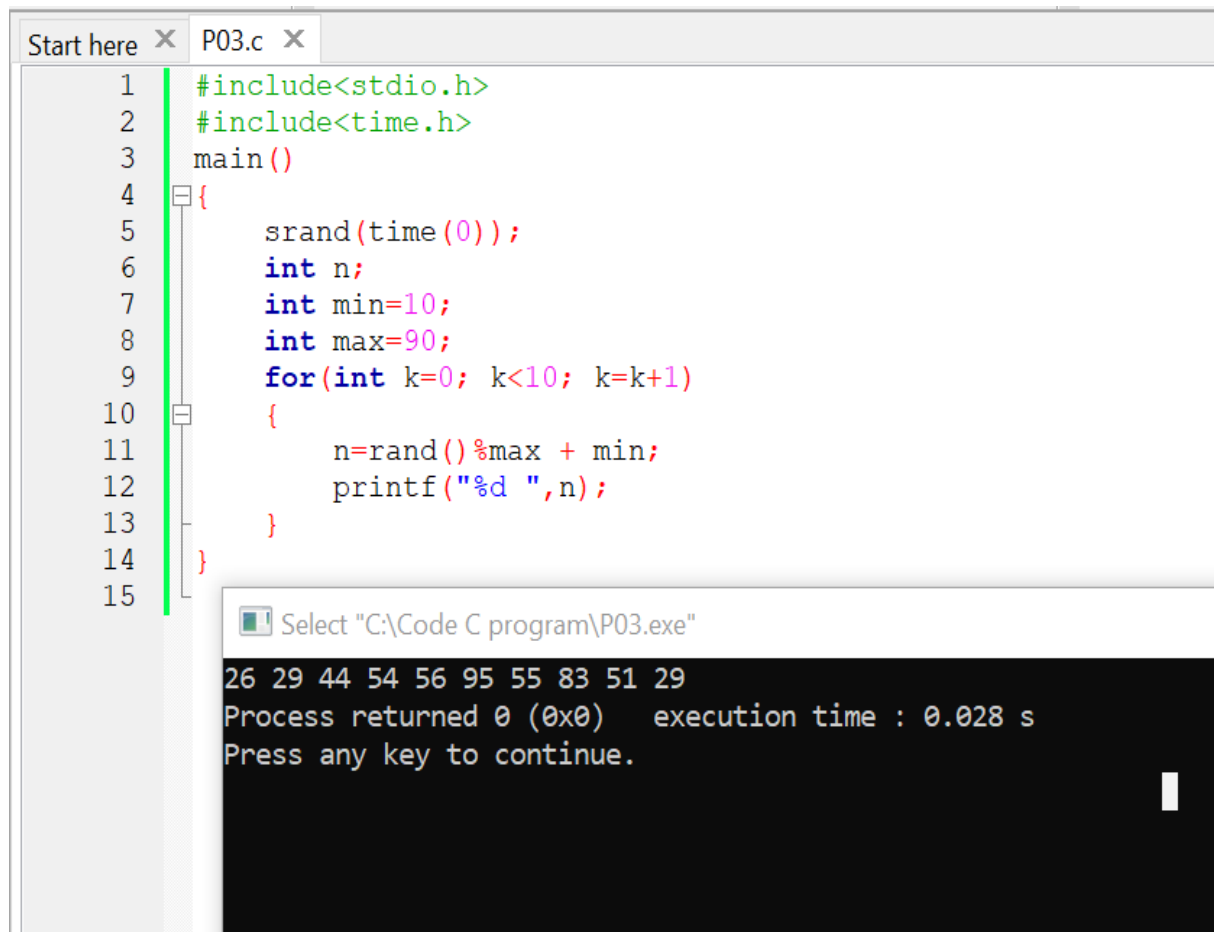
```
1  #include<stdio.h>
2  #include<time.h>
3  main()
4  {
5      int m,n;
6      printf("Enter m: ");scanf("%d",&m);
7      printf("Enter n: ");scanf("%d",&n);
8
9      int k;
10     printf("Display\t");
11     for(k=m; k<=n; k=k+1){
12         printf("%d ",k);
13     }
14
15     printf("\nDisplay\t");
16     int i=m;
17     while(i<=n){
18         printf("%d ",i);
19         i++;
20     }
21
22
23     srand(time(0));
24     int j=m,l;
25     printf("\nDisplay\t");
26     for(int j=m; j<=n; j=j+1){
27         l=rand();
28         printf("%d ",j);
29     }
```

To the right of the editor is a window titled '"C:\Code C program\P02.exe"'. It shows the program's execution output:

```
Enter m: 5
Enter n: 10
Display 5 6 7 8 9 10
Display 5 6 7 8 9 10
Display 5 6 7 8 9 10
Process returned 0 (0x0)   execution time : 9.075 s
Press any key to continue.
```

Problem3- Write a C program to generate 10 random numbers in between [10, 10000]. Display those randomized numbers on screen.

=> 20 79 193 284 999 ...

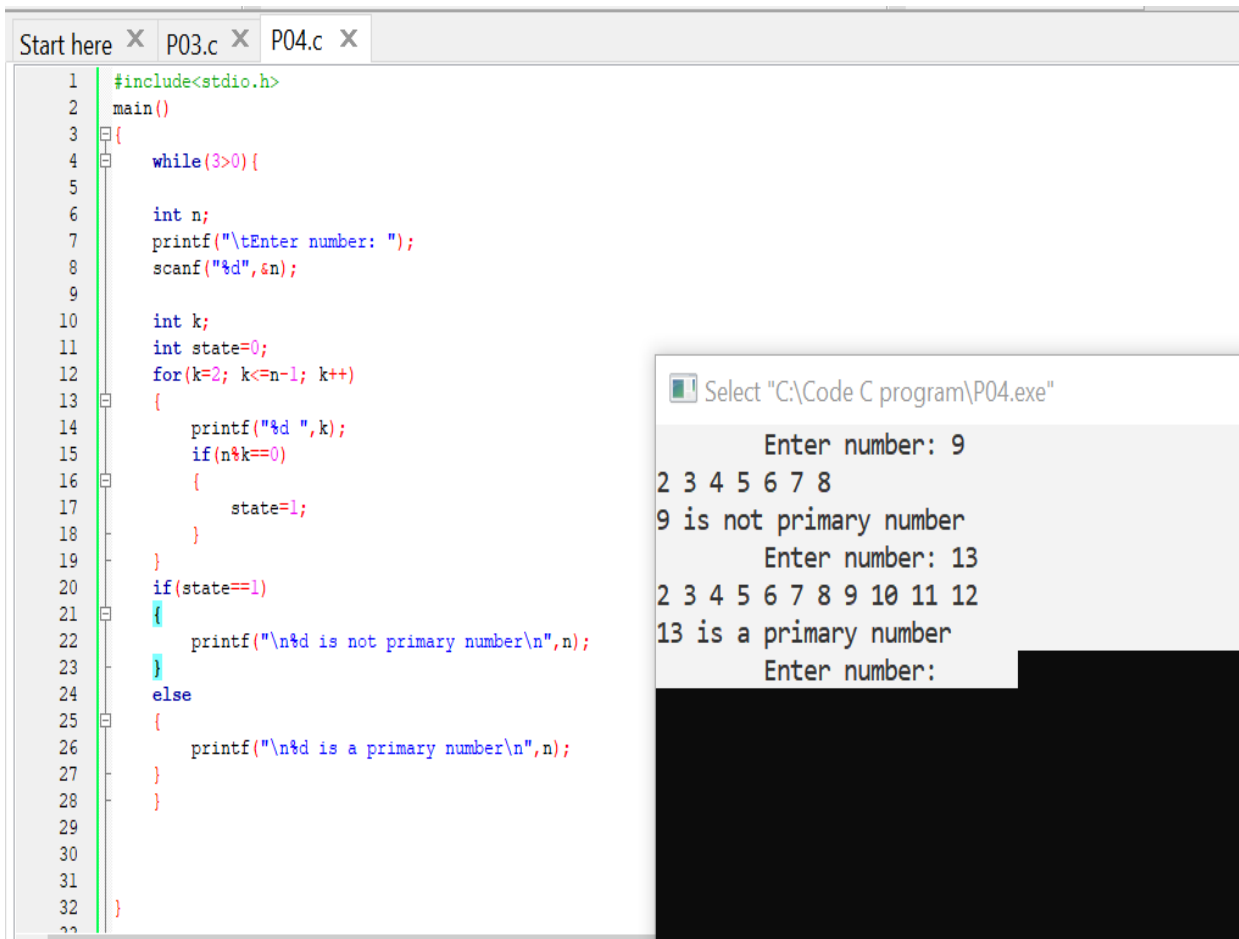


The image shows a screenshot of a C program editor and its execution output. The editor window, titled 'P03.c', contains the following code:

```
1  #include<stdio.h>
2  #include<time.h>
3  main()
4  {
5      srand(time(0));
6      int n;
7      int min=10;
8      int max=90;
9      for(int k=0; k<10; k=k+1)
10     {
11         n=rand()%max + min;
12         printf("%d ",n);
13     }
14 }
15
```

Below the editor, a command prompt window shows the execution of 'P03.exe'. The output displays 10 random numbers: 26 29 44 54 56 95 55 83 51 29. It also shows the process return code as 0 (0x0) and the execution time as 0.028 s. The prompt asks to press any key to continue.

Problem4- Write a C program to check whether an input number is a primary number or not. Display "Primary" if it is a primary number. If not primary, display "NOT primary!". Remark: Keep the program running again so that we can always check another input number.



The image shows a code editor window with a C program and a separate window showing the program's execution output.

Code Editor Window:

- File tabs: Start here, P03.c, P04.c
- Code content:

```
1 #include<stdio.h>
2 main()
3 {
4     while(3>0){
5
6         int n;
7         printf("\tEnter number: ");
8         scanf("%d",&n);
9
10        int k;
11        int state=0;
12        for(k=2; k<=n-1; k++)
13        {
14            printf("%d ",k);
15            if(n%k==0)
16            {
17                state=1;
18            }
19        }
20        if(state==1)
21        {
22            printf("\n%d is not primary number\n",n);
23        }
24        else
25        {
26            printf("\n%d is a primary number\n",n);
27        }
28    }
29
30
31
32 }
```

Execution Output Window:

- Title: Select "C:\Code C program\P04.exe"
- Output:

```
Enter number: 9
2 3 4 5 6 7 8
9 is not primary number
Enter number: 13
2 3 4 5 6 7 8 9 10 11 12
13 is a primary number
Enter number:
```

Problem5- Write a C program to find maximum number between 10 numbers entered by the user. You are not allowed to create 10 variables for that numbers.

Hint:

- Use 'for' loop, make it run 10 times
- Get each input inside loop. Check and update max value.

The screenshot shows a C program in a text editor with the following code:

```
1  #include<stdio.h>
2  main()
3  {
4      int limit,num,count,max;
5      printf("Enter of limit: ");
6      scanf("%d",&limit);
7
8      printf("Enter %d numbers: ",limit);
9      for (count=1; count<=limit; count++)
10     {
11         scanf("%d",&num);
12         if(num>max || count==1)
13         {
14             max=num;
15         }
16     }
17
18     printf("Maximum number is: %d \n",max);
19 }
20
```

Below the code editor, the execution output is shown in a black window titled "C:\Code C program\P05.exe":

```
Enter of limit: 10
Enter 10 numbers: 1 3 4 6 7 8 9 10 12 2
Maximum number is: 12

Process returned 0 (0x0)   execution time : 51.106 s
Press any key to continue.
```

The bottom of the screenshot shows a "Logs & others" panel with a search bar and a "File" tab.