

ព្រះរាជាណាចក្រកម្ពុជា
ជាតិ សាសនា ព្រះមហាក្សត្រ

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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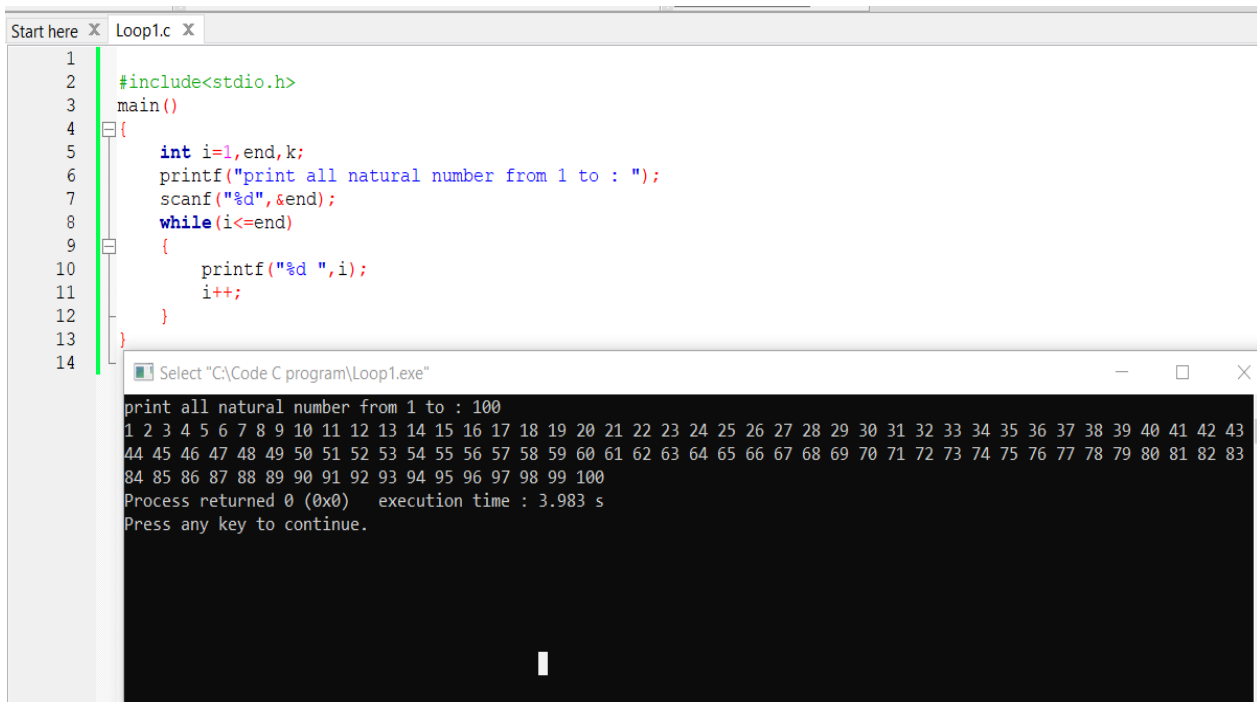
Year: 2021-2022

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Problem1: Write a c program to print natural number from 1 to n using while loop

a

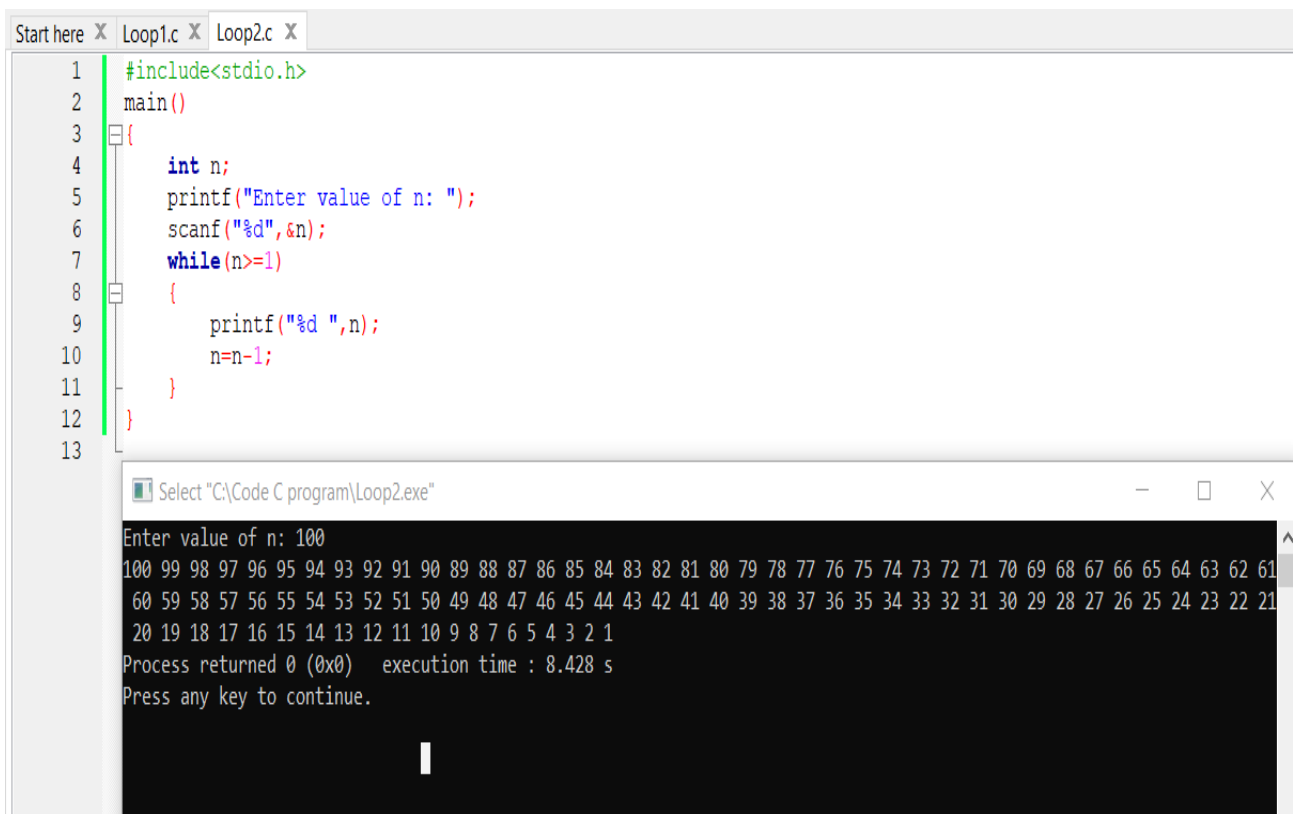


```
1
2 #include<stdio.h>
3 main()
4 {
5     int i=1,end,k;
6     printf("print all natural number from 1 to : ");
7     scanf("%d",&end);
8     while(i<=end)
9     {
10        printf("%d ",i);
11        i++;
12    }
13 }
14
```

Select "C:\Code C program\Loop1.exe"

print all natural number from 1 to : 100
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 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43
44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83
84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100
Process returned 0 (0x0) execution time : 3.983 s
Press any key to continue.

Problem2: write c programing to print all natural number in serverse n to 1 using while loop.

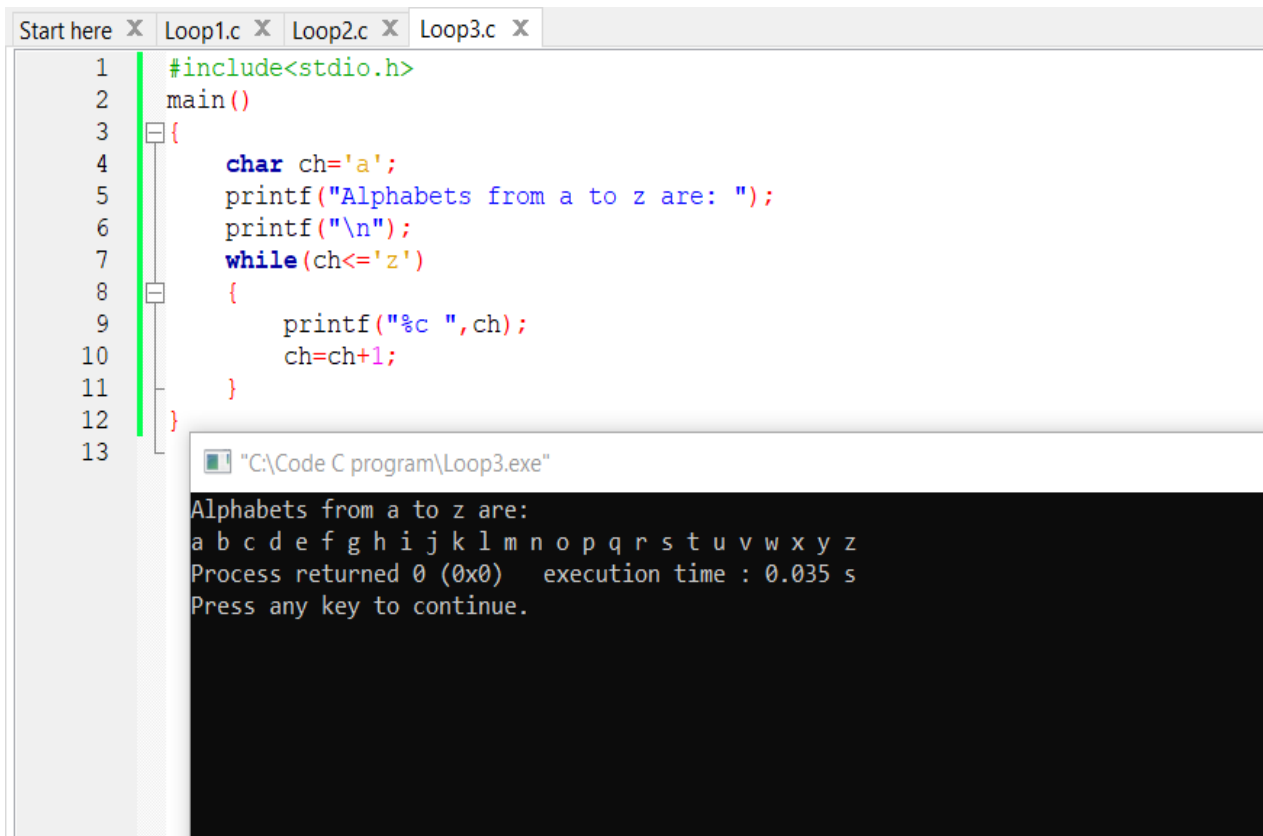


```
1 #include<stdio.h>
2 main()
3 {
4     int n;
5     printf("Enter value of n: ");
6     scanf("%d",&n);
7     while(n>=1)
8     {
9         printf("%d ",n);
10        n=n-1;
11    }
12 }
13
```

Select "C:\Code C program\Loop2.exe"

Enter value of n: 100
100 99 98 97 96 95 94 93 92 91 90 89 88 87 86 85 84 83 82 81 80 79 78 77 76 75 74 73 72 71 70 69 68 67 66 65 64 63 62 61
60 59 58 57 56 55 54 53 52 51 50 49 48 47 46 45 44 43 42 41 40 39 38 37 36 35 34 33 32 31 30 29 28 27 26 25 24 23 22 21
20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1
Process returned 0 (0x0) execution time : 8.428 s
Press any key to continue.

Problem3: write c program to print all alphabets a to z using while loop.



The screenshot shows a C program in a text editor with tabs for 'Start here', 'Loop1.c', 'Loop2.c', and 'Loop3.c'. The code in 'Loop3.c' is as follows:

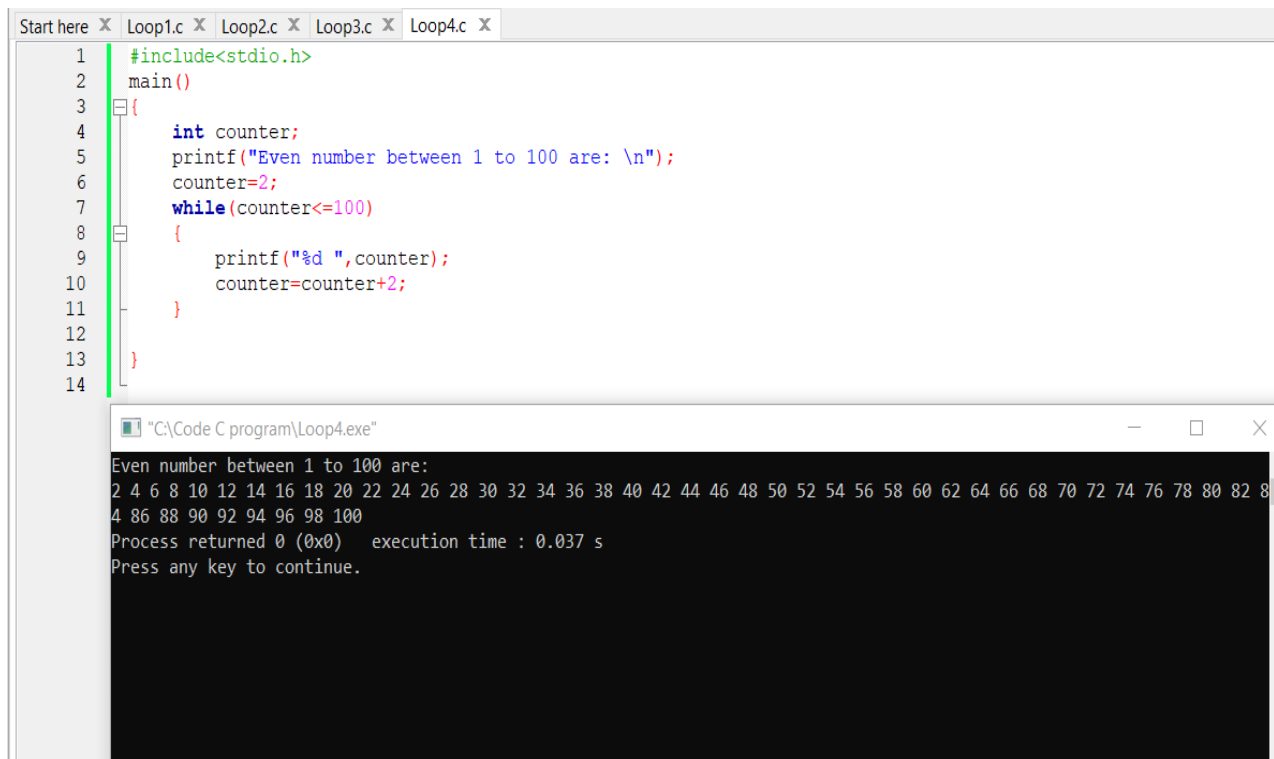
```
1  #include<stdio.h>
2  main()
3  {
4      char ch='a';
5      printf("Alphabets from a to z are: ");
6      printf("\n");
7      while(ch<='z')
8      {
9          printf("%c ",ch);
10         ch=ch+1;
11     }
12 }
13
```

Below the code, a terminal window titled '"C:\Code C program\Loop3.exe"' shows the output:

```
Alphabets from a to z are:
a b c d e f g h i j k l m n o p q r s t u v w x y z
Process returned 0 (0x0)   execution time : 0.035 s
Press any key to continue.
```

Problem4: write c program to print all even number between 1 to 100 using while loop.

a



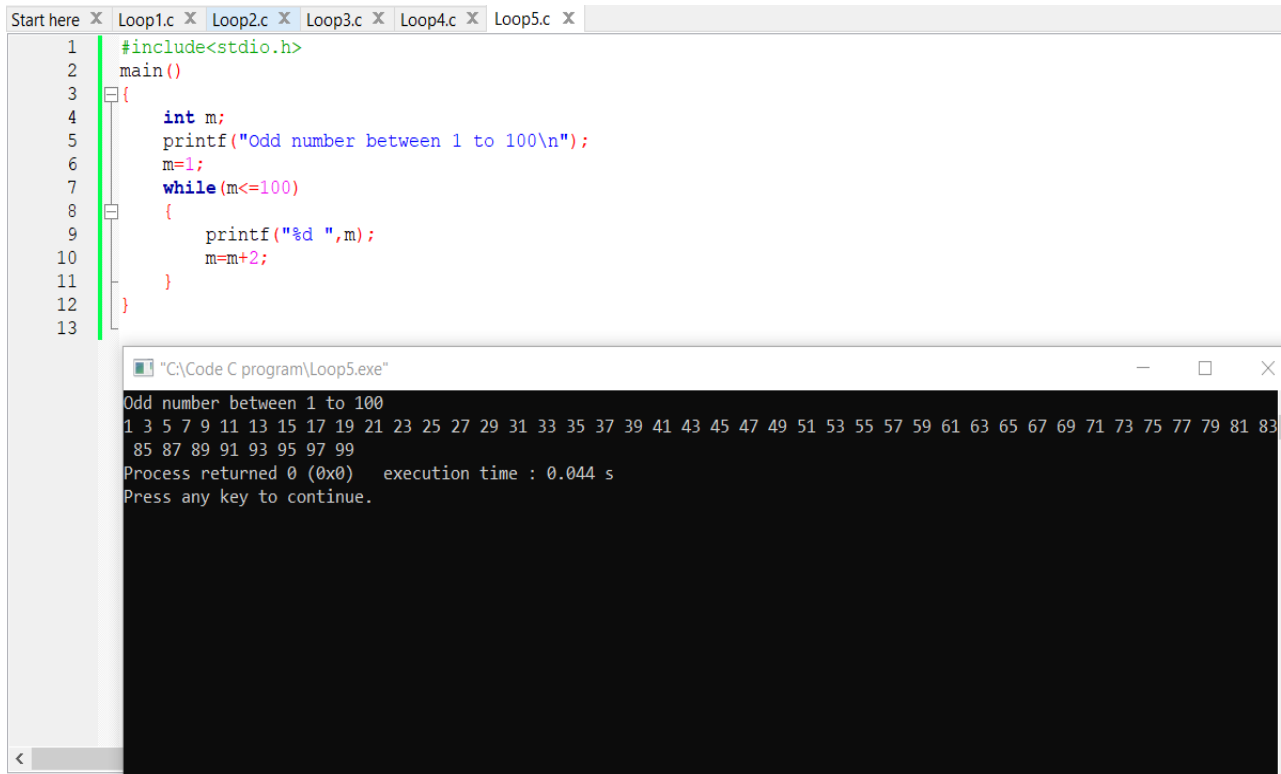
The screenshot shows a C program in a text editor with tabs for 'Start here', 'Loop1.c', 'Loop2.c', 'Loop3.c', and 'Loop4.c'. The code in 'Loop4.c' is as follows:

```
1  #include<stdio.h>
2  main()
3  {
4      int counter;
5      printf("Even number between 1 to 100 are: \n");
6      counter=2;
7      while(counter<=100)
8      {
9          printf("%d ",counter);
10         counter=counter+2;
11     }
12 }
13
14
```

Below the code, a terminal window titled '"C:\Code C program\Loop4.exe"' shows the output:

```
Even number between 1 to 100 are:
2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72 74 76 78 80 82 84 86 88 90 92 94 96 98 100
Process returned 0 (0x0)   execution time : 0.037 s
Press any key to continue.
```

Problem5: write c program to print all odd number between 1 to 100.



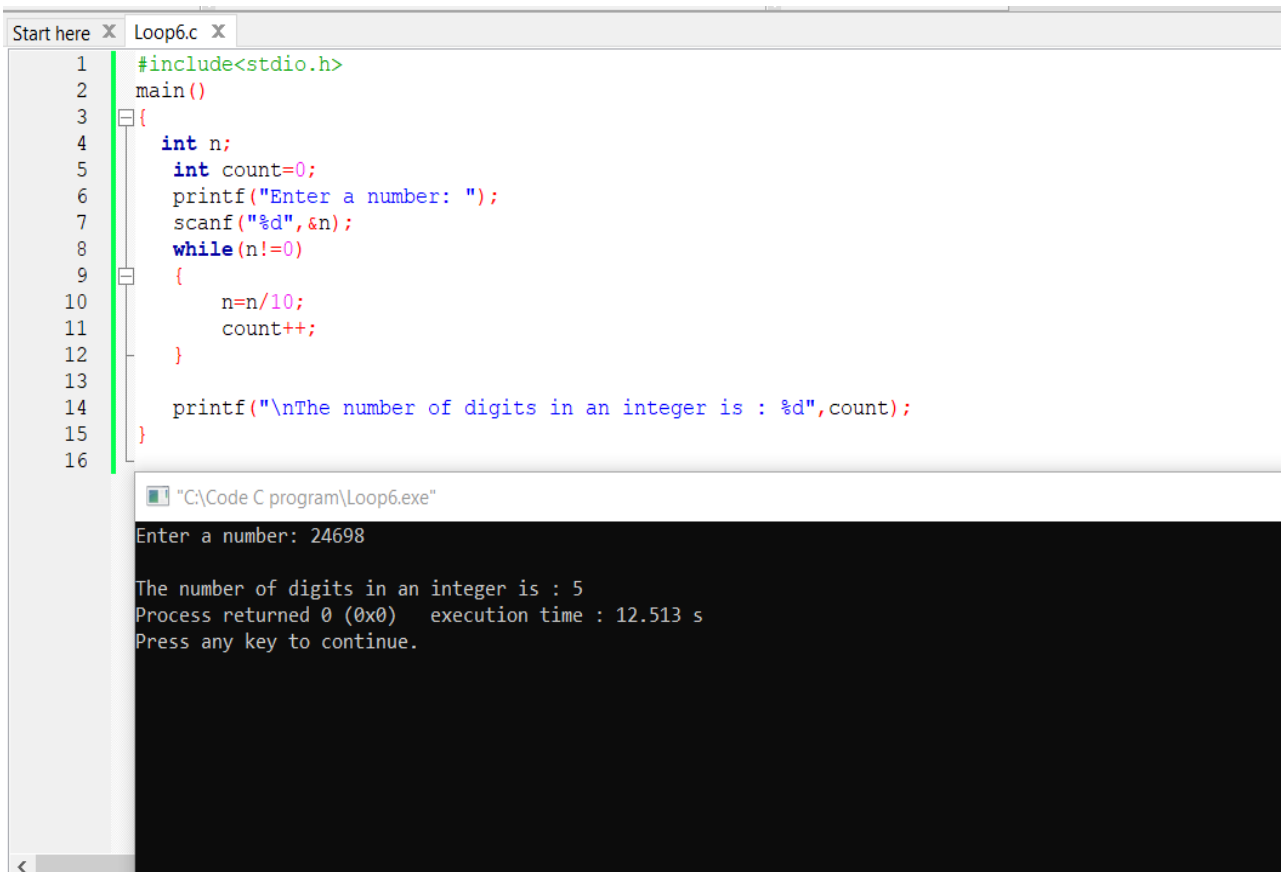
The screenshot shows a C program in a text editor with tabs for 'Start here', 'Loop1.c', 'Loop2.c', 'Loop3.c', 'Loop4.c', and 'Loop5.c'. The code in 'Loop5.c' is as follows:

```
1 #include<stdio.h>
2 main()
3 {
4     int m;
5     printf("Odd number between 1 to 100\n");
6     m=1;
7     while(m<=100)
8     {
9         printf("%d ",m);
10        m=m+2;
11    }
12 }
13
```

Below the code, a console window titled '"C:\Code C program\Loop5.exe"' shows the output:

```
Odd number between 1 to 100
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47 49 51 53 55 57 59 61 63 65 67 69 71 73 75 77 79 81 83
85 87 89 91 93 95 97 99
Process returned 0 (0x0)   execution time : 0.044 s
Press any key to continue.
```

Problem6: write c program to count number of digits in a number.



The screenshot shows a C program in a text editor with tabs for 'Start here' and 'Loop6.c'. The code in 'Loop6.c' is as follows:

```
1 #include<stdio.h>
2 main()
3 {
4     int n;
5     int count=0;
6     printf("Enter a number: ");
7     scanf("%d",&n);
8     while(n!=0)
9     {
10        n=n/10;
11        count++;
12    }
13
14    printf("\nThe number of digits in an integer is : %d",count);
15 }
16
```

Below the code, a console window titled '"C:\Code C program\Loop6.exe"' shows the output:

```
Enter a number: 24698

The number of digits in an integer is : 5
Process returned 0 (0x0)   execution time : 12.513 s
Press any key to continue.
```

Problem7: Write c program to calculate sum of digits of number .

Start here X Loop6.c X Loop7.c X

```
1 #include<stdio.h>
2 main()
3 {
4
5
6     int num, sum=0, r;
7     printf("Enter any number: ");
8     scanf("%d", &num);
9     while(num>0)
10    {
11        r = num%10;
12        sum = sum + r;
13        num = num/10;
14    }
15    printf("\nSum of Digit = %d", sum);
16
17
18 }
19
```

"C:\Code C program\Loop7.exe"

Enter any number: 1459

Sum of Digit = 19

Process returned 0 (0x0) execution time : 15.438 s

Press any key to continue.

a

Problem8: Write a c program to display all primary number between[n,m].

Start here X Loop8.c X Loop9.c X

```
1 #include<stdio.h>
2 main()
3 {
4     int mn,mx;
5     printf("Enter mn: ");scanf("%d",&mn);
6     printf("Enter mx: ");scanf("%d",&mx);
7
8     int k;
9     printf("All primary number[%d,%d] are:",mn,mx);
10    for(k=mn; k<=mx; k=k+1){
11        int n;
12        int state=0;
13        for(n=2; n<k; n=n+1){
14            if(k%n==0){
15                state=1;
16            }
17        }
18        if(state==0){
19            printf("%d ",n);
20        }
21    }
22
23 }
24
25
```

"C:\Code C program\Loop8.exe"

Enter mn: 10

Enter mx: 1000

All primary number[10,1000] are:11 13 17 19 23 29 31 37 41 43 47 53 59 61 67 71 73 79 83 89 97 101 103 107 109 113 127 131 137 139 149 151 157 163 167 173 179 181 191 193 197 199 211 223 227 229 233 239 241 251 257 263 269 271 277 281 283 293 307 311 313 317 331 337 347 349 353 359 367 373 379 383 389 397 401 409 419 421 431 433 439 443 449 457 461 463 467 479 487 491 499 503 509 521 523 541 547 557 563 569 571 577 587 593 599 601 607 613 617 619 631 641 643 647 653 659 661 673 677 683 691 701 709 719 727 733 739 743 751 757 761 769 773 787 797 809 811 821 823 827 829 839 853 857 859 863 877 881 883 887 907 911 919 929 937 941 947 953 967 971 977 983 991 997

Process returned 0 (0x0) execution time : 11.553 s

Press any key to continue.

Problem9: Write a c program enter a number and print severse.

The screenshot shows a C program in a text editor with tabs for 'Start here', 'Loop8.c', and 'Loop9.c'. The code in 'Loop9.c' is as follows:

```
1 #include<stdio.h>
2 main()
3 {
4     int n,revers=0,rem;
5     printf("Enter of number: ");
6     scanf("%d",&n);
7     while(n!=0)
8     {
9         rem=n%10;
10        revers=revers*10+rem;
11        n/=10;
12    }
13    printf("Revers number is: %d ",revers);
14 }
15
```

Below the editor is a console window titled '"C:\Code C program\Loop9.exe"'. It displays the following output:

```
Enter of number: 123456789
Revers number is: 987654321
Process returned 0 (0x0)    execution time : 13.416 s
Press any key to continue.
```

Problem10: Write a c program to print all ASCII codes 0 to 255 and character.

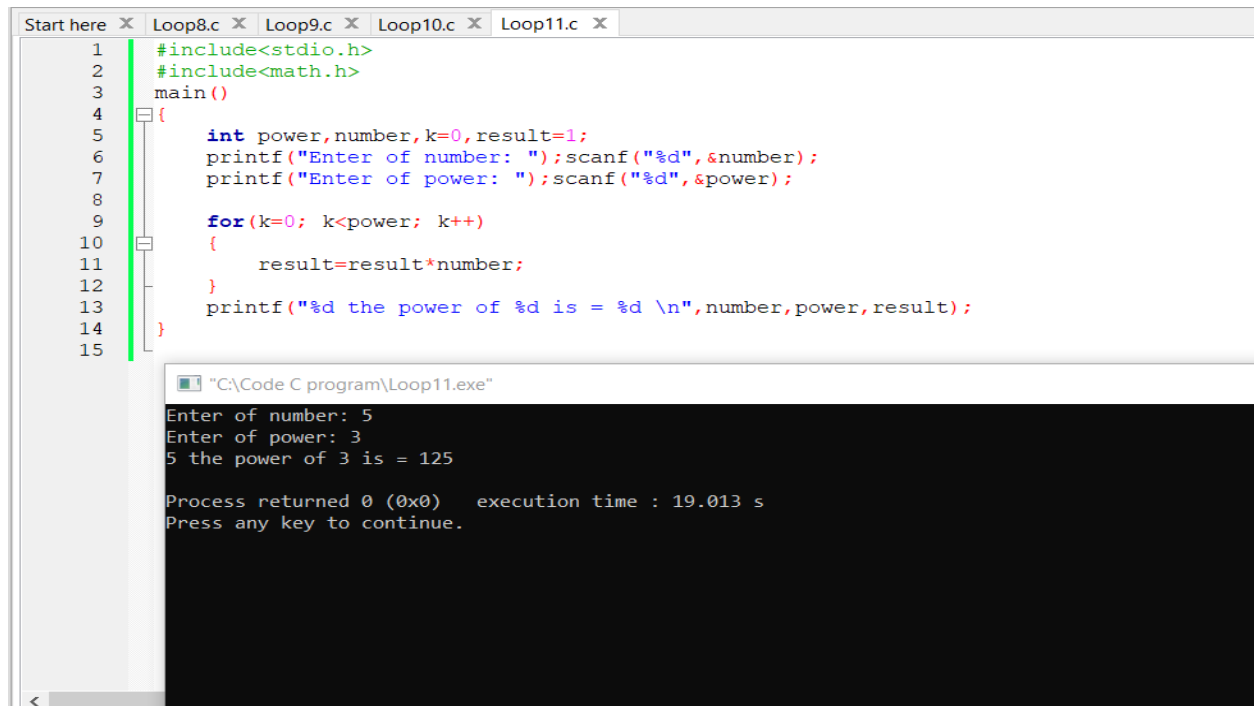
The screenshot shows a C program in a text editor with tabs for 'Start here', 'Loop8.c', 'Loop9.c', and 'Loop10.c'. The code in 'Loop10.c' is as follows:

```
1 #include<stdio.h>
2 main()
3 {
4     int k;
5     for(k=0; k<=255; k++)
6     {
7         printf("ASCII value of character %c = %d \n",k,k);
8     }
9 }
10
```

Below the editor is a console window titled '"C:\Code C program\Loop10.exe"'. It displays the following output:

```
ASCII value of character = 0
ASCII value of character   = 1
ASCII value of character   = 2
ASCII value of character   = 3
ASCII value of character   = 4
ASCII value of character   = 5
ASCII value of character   = 6
ASCII value of character   = 7
ASCII value of character   = 8
ASCII value of character   = 9
ASCII value of character   = 10
ASCII value of character   = 11
ASCII value of character   = 12
ASCII value of character   = 13
ASCII value of character   = 14
ASCII value of character   = 15
ASCII value of character   = 16
ASCII value of character   = 17
ASCII value of character   = 18
ASCII value of character   = 19
ASCII value of character   = 20
ASCII value of character   = 21
ASCII value of character   = 22
ASCII value of character   = 23
ASCII value of character   = 24
ASCII value of character   = 25
ASCII value of character   = 26
ASCII value of character   = 27
ASCII value of character   = 28
```

Problem11: write c program to find power of number using for loop.



The screenshot shows a C program in a code editor with tabs for Loop8.c, Loop9.c, Loop10.c, and Loop11.c. The code in Loop11.c is as follows:

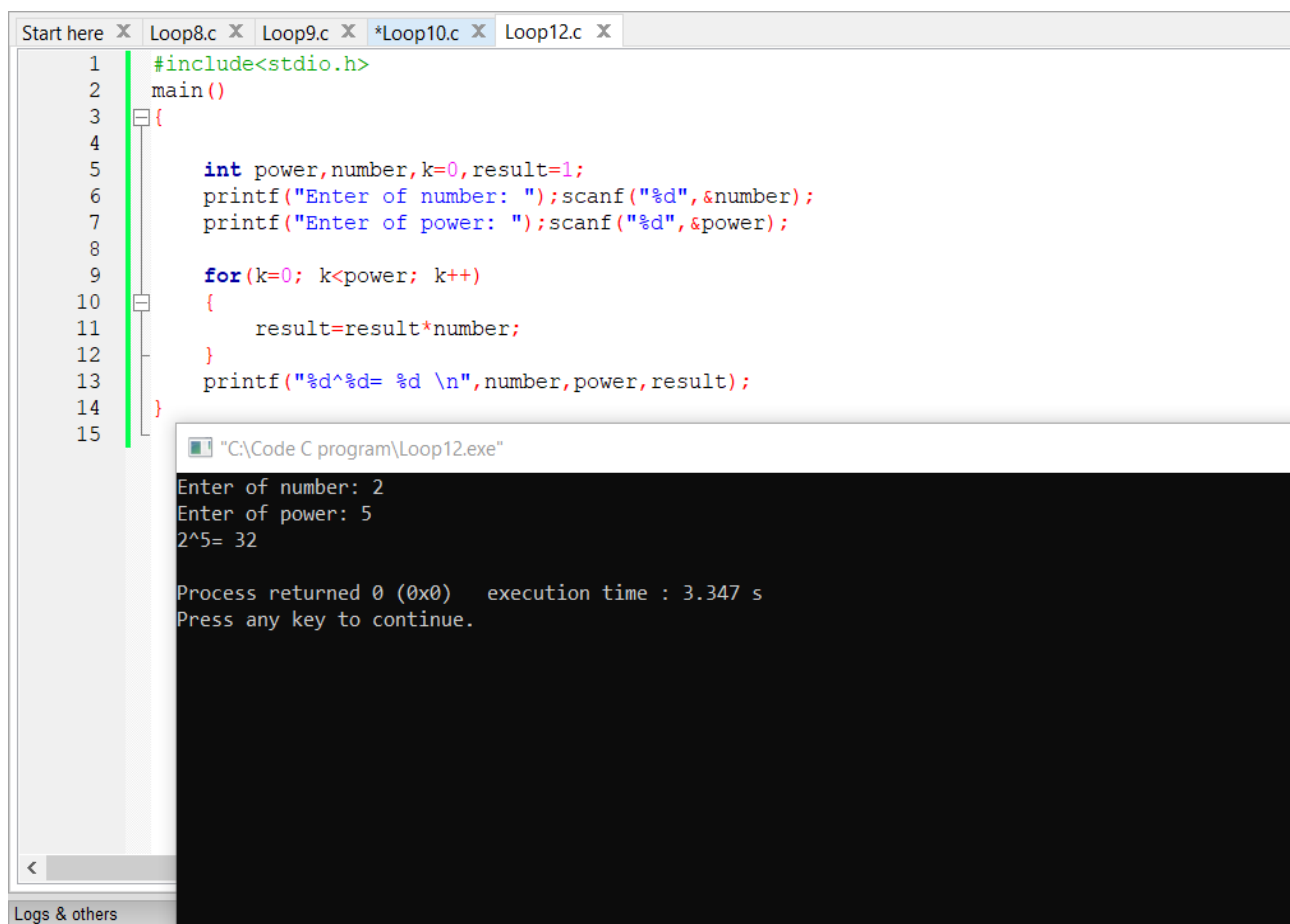
```
1 #include<stdio.h>
2 #include<math.h>
3 main()
4 {
5     int power,number,k=0,result=1;
6     printf("Enter of number: ");scanf("%d",&number);
7     printf("Enter of power: ");scanf("%d",&power);
8
9     for(k=0; k<power; k++)
10    {
11        result=result*number;
12    }
13    printf("%d the power of %d is = %d \n",number,power,result);
14 }
15
```

Below the code editor is a console window titled "C:\Code C program\Loop11.exe" showing the program's execution:

```
Enter of number: 5
Enter of power: 3
5 the power of 3 is = 125

Process returned 0 (0x0)   execution time : 19.013 s
Press any key to continue.
```

Probnlem12: write c program to calculate factorial of number.



The screenshot shows a C program in a code editor with tabs for Loop8.c, Loop9.c, *Loop10.c, and Loop12.c. The code in Loop12.c is as follows:

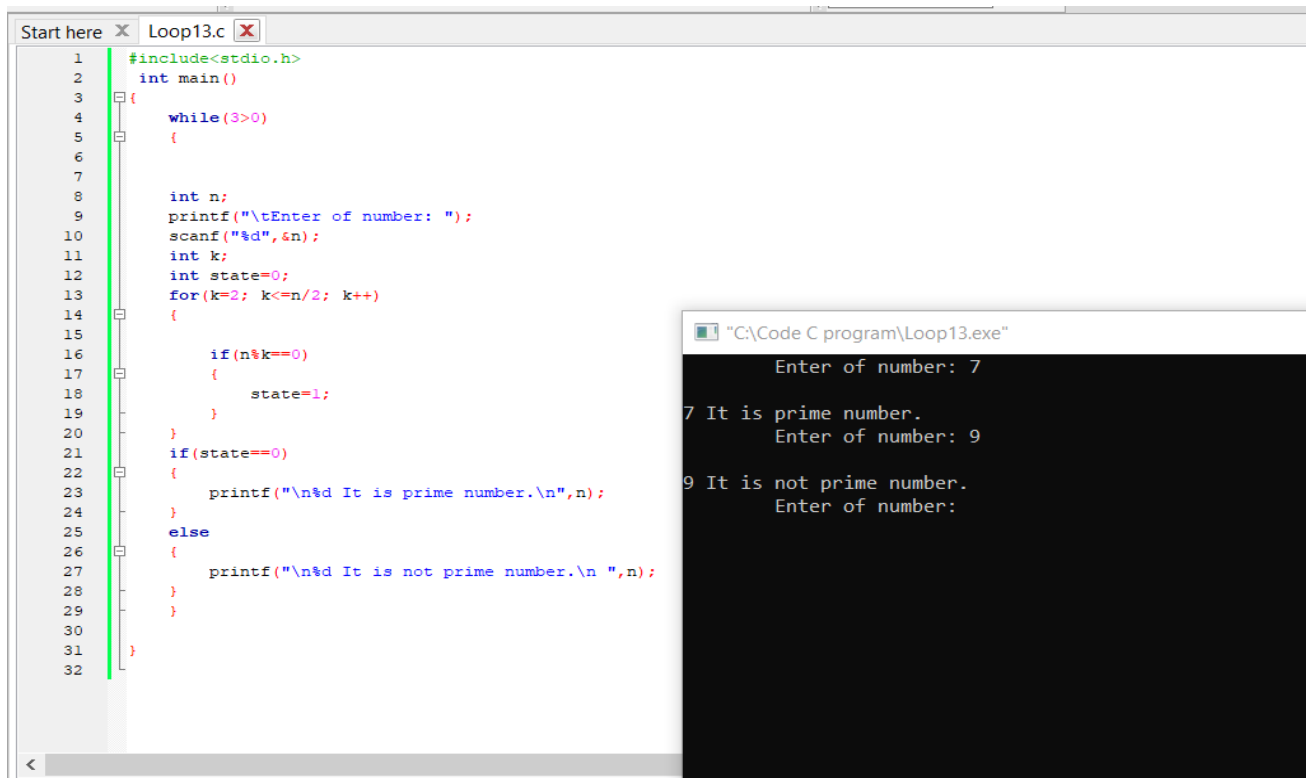
```
1 #include<stdio.h>
2 main()
3 {
4
5     int power,number,k=0,result=1;
6     printf("Enter of number: ");scanf("%d",&number);
7     printf("Enter of power: ");scanf("%d",&power);
8
9     for(k=0; k<power; k++)
10    {
11        result=result*number;
12    }
13    printf("%d^%d= %d \n",number,power,result);
14 }
15
```

Below the code editor is a console window titled "C:\Code C program\Loop12.exe" showing the program's execution:

```
Enter of number: 2
Enter of power: 5
2^5= 32

Process returned 0 (0x0)   execution time : 3.347 s
Press any key to continue.
```


Problem13: write c program to check a number is prime number or not.



The screenshot shows a C program in a text editor and its execution output in a console window.

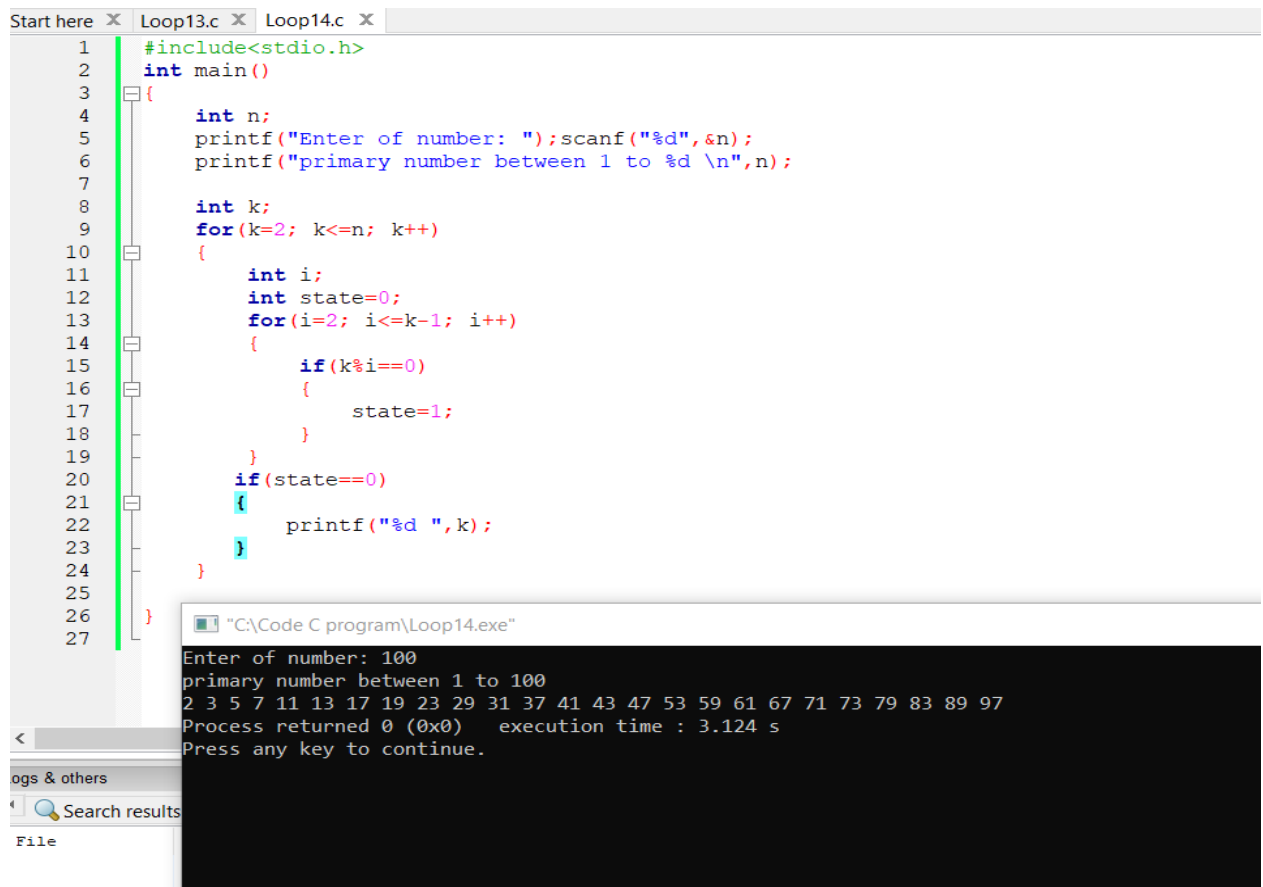
Code (Loop13.c):

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

Output (C:\Code C program\Loop13.exe):

```
Enter of number: 7
7 It is prime number.
Enter of number: 9
9 It is not prime number.
Enter of number:
```

Problem14: Write c program to print all prime number between 1 to n.



The screenshot shows a C program in a text editor and its execution output in a console window.

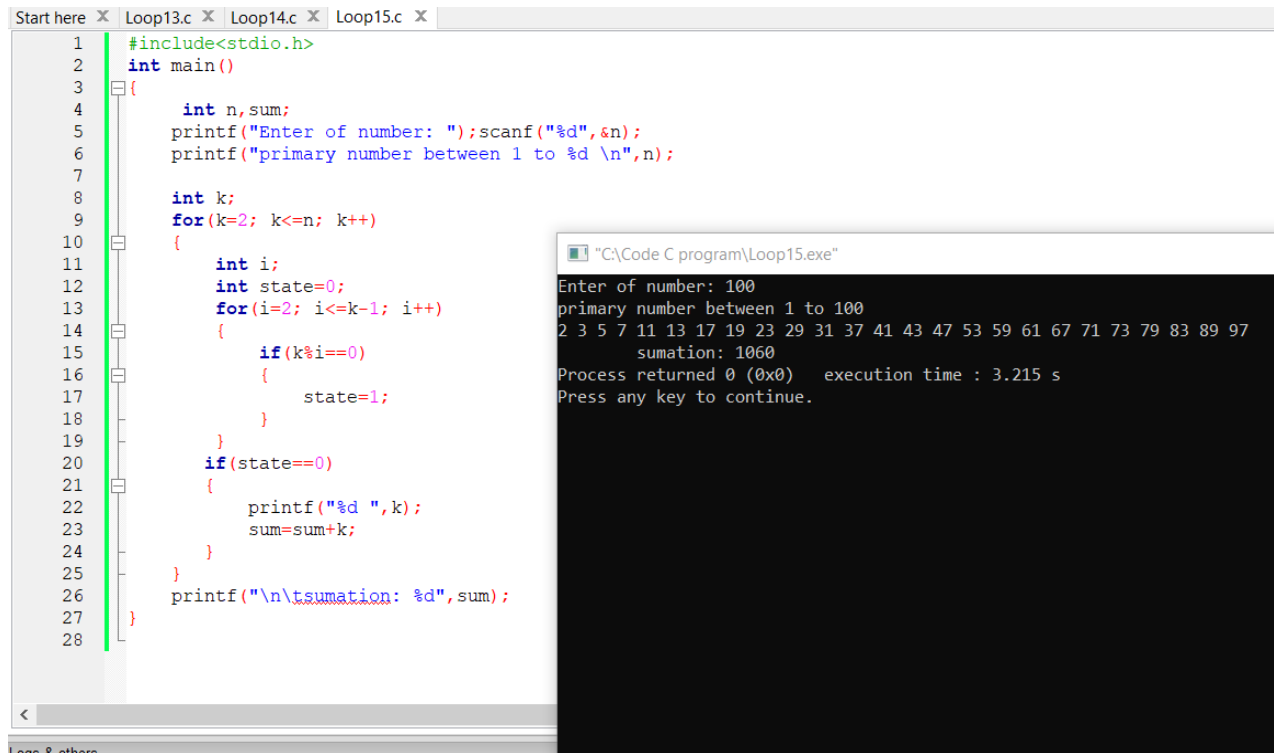
Code (Loop14.c):

```
1  #include<stdio.h>
2  int main()
3  {
4      int n;
5      printf("Enter of number: ");scanf("%d",&n);
6      printf("primary number between 1 to %d \n",n);
7
8      int k;
9      for(k=2; k<=n; k++)
10     {
11         int i;
12         int state=0;
13         for(i=2; i<=k-1; i++)
14         {
15             if(k%i==0)
16             {
17                 state=1;
18             }
19         }
20         if(state==0)
21         {
22             printf("%d ",k);
23         }
24     }
25
26 }
27 }
```

Output (C:\Code C program\Loop14.exe):

```
Enter of number: 100
primary number between 1 to 100
2 3 5 7 11 13 17 19 23 29 31 37 41 43 47 53 59 61 67 71 73 79 83 89 97
Process returned 0 (0x0)   execution time : 3.124 s
Press any key to continue.
```

Problem15: write c program to find sum of all prime number between 1 to n.

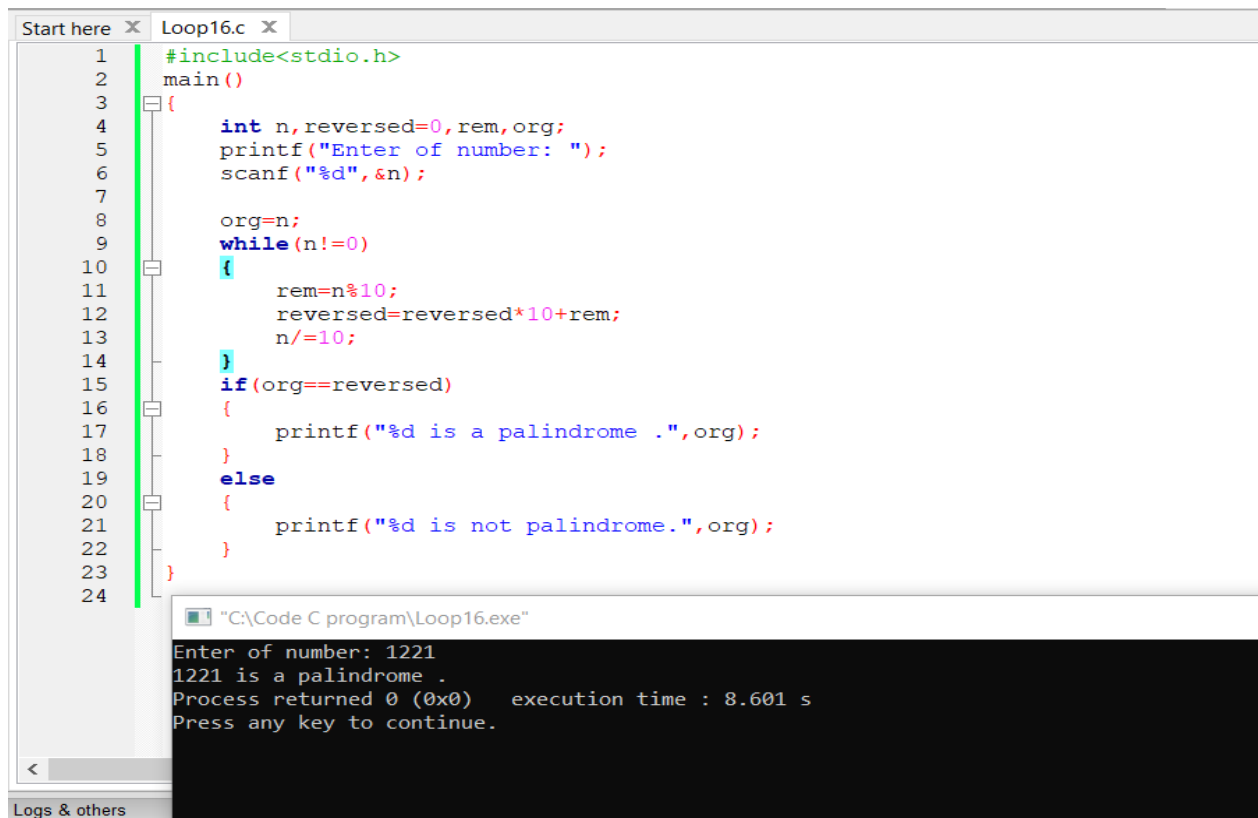


```
1 #include<stdio.h>
2 int main()
3 {
4     int n,sum;
5     printf("Enter of number: ");scanf("%d",&n);
6     printf("primary number between 1 to %d \n",n);
7
8     int k;
9     for(k=2; k<=n; k++)
10    {
11        int i;
12        int state=0;
13        for(i=2; i<=k-1; i++)
14        {
15            if(k%i==0)
16            {
17                state=1;
18            }
19        }
20        if(state==0)
21        {
22            printf("%d ",k);
23            sum=sum+k;
24        }
25    }
26    printf("\n\tsumation: %d",sum);
27 }
28
```

"C:\Code C program\Loop15.exe"

Enter of number: 100
primary number between 1 to 100
2 3 5 7 11 13 17 19 23 29 31 37 41 43 47 53 59 61 67 71 73 79 83 89 97
sumation: 1060
Process returned 0 (0x0) execution time : 3.215 s
Press any key to continue.

Problem16: Write c program to check whether a number is palindrome or not.



```
1 #include<stdio.h>
2 main()
3 {
4     int n,reversed=0,rem,org;
5     printf("Enter of number: ");
6     scanf("%d",&n);
7
8     org=n;
9     while(n!=0)
10    {
11        rem=n%10;
12        reversed=reversed*10+rem;
13        n/=10;
14    }
15    if(org==reversed)
16    {
17        printf("%d is a palindrome .",org);
18    }
19    else
20    {
21        printf("%d is not palindrome.",org);
22    }
23 }
24
```

"C:\Code C program\Loop16.exe"

Enter of number: 1221
1221 is a palindrome .
Process returned 0 (0x0) execution time : 8.601 s
Press any key to continue.

```
1 #include<stdio.h>
2 main()
3 {
4     int n, reversed=0, rem, org;
5     printf("Enter of number: ");
6     scanf("%d", &n);
7
8     org=n;
9     while(n!=0)
10    {
11        rem=n%10;
12        reversed=reversed*10+rem;
13        n/=10;
14    }
15    if(org==reversed)
16    {
17        printf("%d is a palindrome .", org);
18    }
19    else
20    {
21        printf("%d is not palindrome.", org);
22    }
23 }
24
```

"C:\Code C program\Loop16.exe"

Enter of number: 123
123 is not palindrome.
Process returned 0 (0x0) execution time : 3.167 s
Press any key to continue.

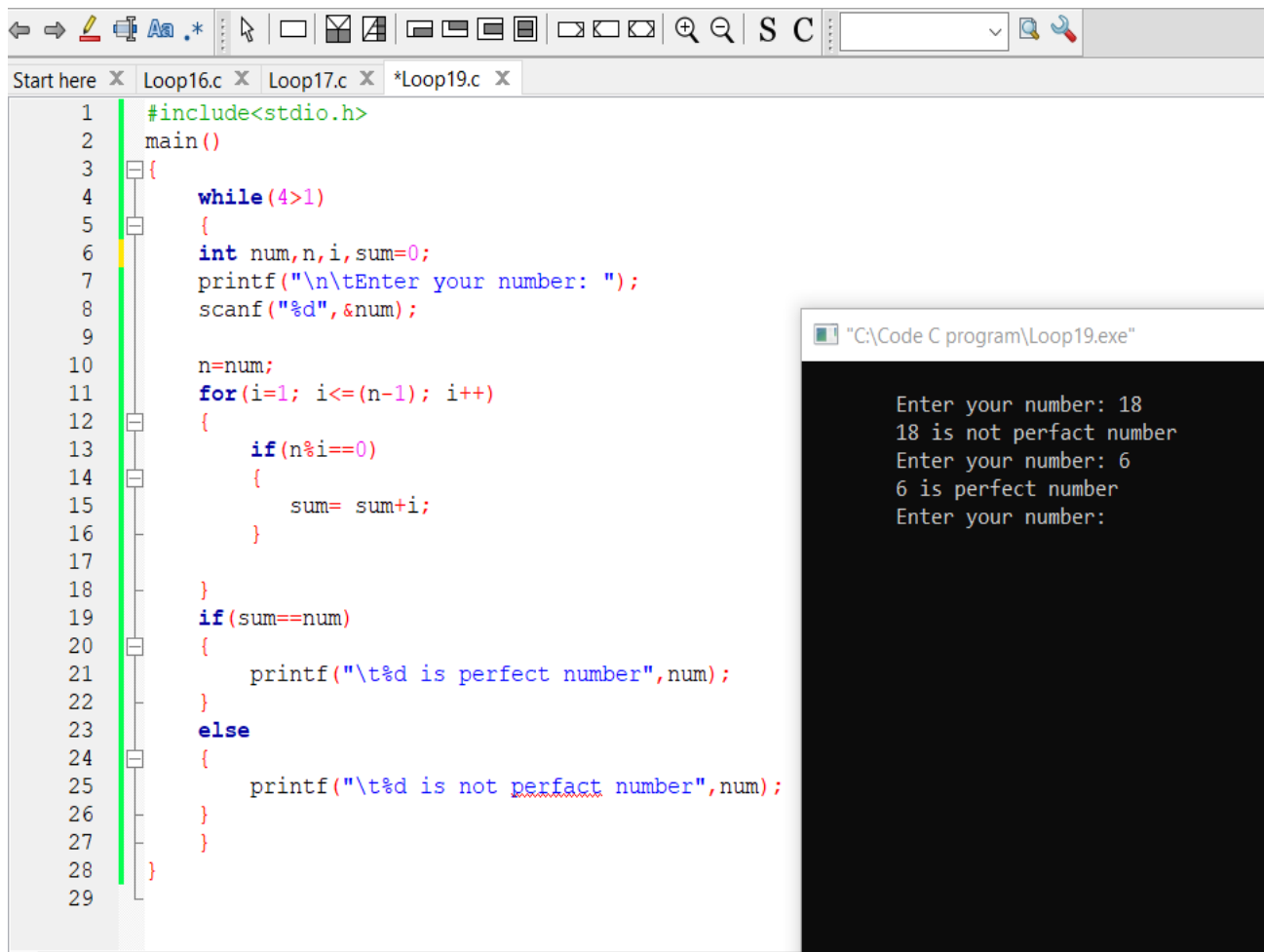
Problem17: write c program to check a number is Armstrong or nit.

```
1 #include<stdio.h>
2 main()
3 {
4     while(3>2)
5     {
6
7
8     int num, rem, c, tem, sum=0;
9     printf("Enter of number: ");
10    scanf("%d", &num);
11    tem=num;
12    while(num>0)
13    {
14        rem=num%10;
15        c=rem*rem*rem;
16        sum=sum+c;
17        num=num/10;
18    }
19    num=tem;
20    if(sum==num)
21    {
22        printf("\t it is a armstong number\n");
23    }
24    else
25    {
26        printf("\t it is not armstong number\n");
27    }
28    }
29 }
30
```

"C:\Code C program\Loop17.exe"

Enter of number: 153
it is a armstong number
Enter of number: 176
it is not armstong number
Enter of number:

Problem19: Write a c program to check a number is perfect number or not.



The image shows a C program in a code editor and its execution output. The code is as follows:

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

The execution output is shown in a separate window titled "C:\Code C program\Loop19.exe":

```
Enter your number: 18
18 is not perfect number
Enter your number: 6
6 is perfect number
Enter your number:
```