



PROGRAMMING FUNDAMENTALS

Assignment no 2

Course Code: CSC-311

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Built-in-Functions

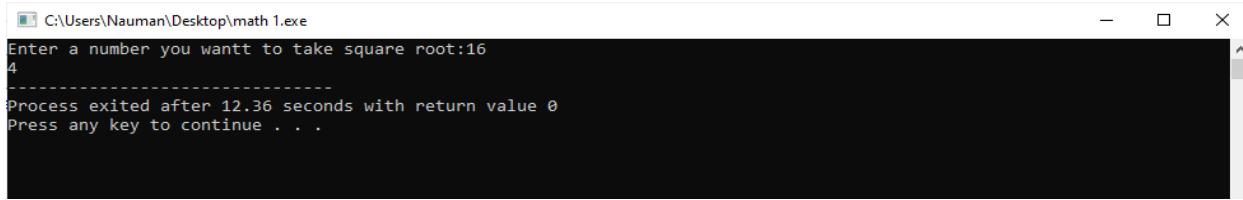
1) Mathematical Built-in Functions (<cmath>)

➤ **sqrt(x) – square root**

Code:

```
#include<iostream>
#include<cmath>
using namespace std;
void scroot(int a)
{
    int r;
    r=sqrt(a);
    cout<<r;
}
int main()
{
    int y;
    cout<<"Enter a number you wantt to take square root:";
    cin>>y;
    scroot(y);
    return 0;
}
```

Output:



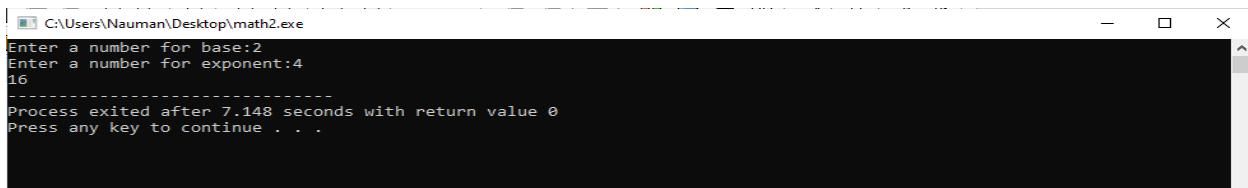
```
C:\Users\Nauman\Desktop\math 1.exe
Enter a number you wantt to take square root:16
4
-----
Process exited after 12.36 seconds with return value 0
Press any key to continue . . .
```

➤ **pow(x, y) – x raised to the power y**

Code:

```
#include<iostream>
#include<cmath>
using namespace std;
void po(int a,int b)
{
    int r;
    r=pow(a,b);
    cout<<r;
}
int main()
{
    int x,y;
    cout<<"Enter a number for base:";
    cin>>x;
    cout<<"Enter a number for exponent:";
    cin>>y;
    po(x,y);
    return 0;
}
```

Output:



```
C:\Users\Nauman\Desktop\math2.exe
Enter a number for base:2
Enter a number for exponent:4
16
Process exited after 7.148 seconds with return value 0
Press any key to continue . . .
```

➤ **abs(x) – absolute value**

Code:

```
#include<iostream>
#include<cmath>
using namespace std;
void abusol(int a)
{
    int r;
    r=abs(a);
    cout<<r;
}
int main()
{
    int x;
    cout<<"Enter a number for absolute value:";
    cin>>x;
    abusol(x);
    return 0;
}
```

Output:

```
C:\Users\Nauman\Desktop\math3.exe
Enter a number for absolute value:-5
5
-----
Process exited after 9.37 seconds with return value 0
Press any key to continue . . .
```

➤ ceil(x) – round up

Code:

```
#include<iostream>
#include<cmath>
using namespace std;
void roundup(float a)
{
    float r;
    r=ceil(a);
    cout<<r;
}
int main()
{
    float x;
    cout<<"Enter a number for round up:";
    cin>>x;
    roundup(x);
    return 0;
}
```

Output:

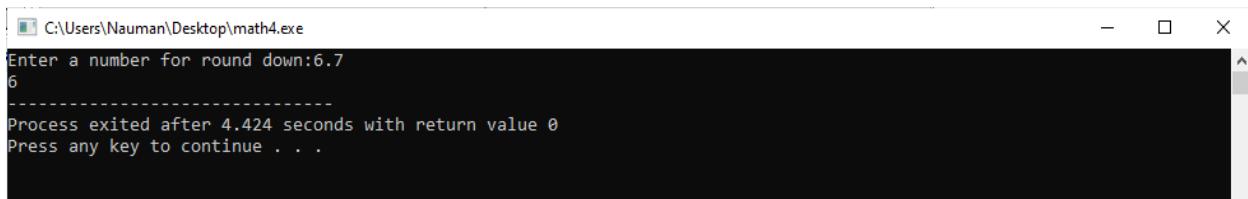
```
C:\Users\Nauman\Desktop\math3.exe
Enter a number for round up:6.7
7
-----
Process exited after 7.789 seconds with return value 0
Press any key to continue . . .
```

➤ **floor(x) – round down**

Code:

```
#include<iostream>
#include<cmath>
using namespace std;
void rounddo(float a)
{
    float r;
    r=floor(a);
    cout<<r;
}
int main()
{
    float x;
    cout<<"Enter a number for round down:";
    cin>>x;
    rounddo(x);
    return 0;
}
```

Output:

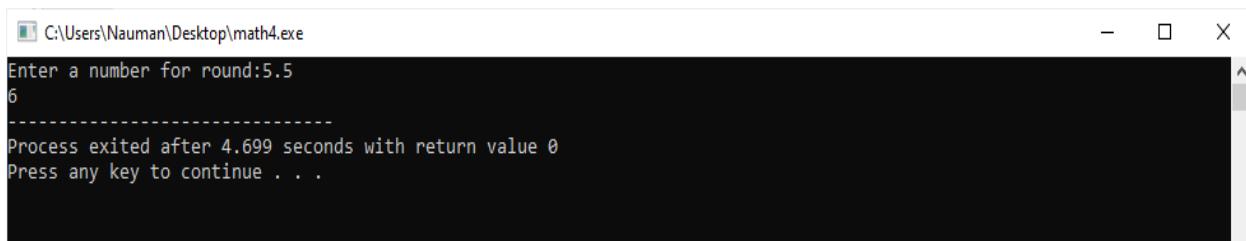


➤ **round(x) – nearest integer**

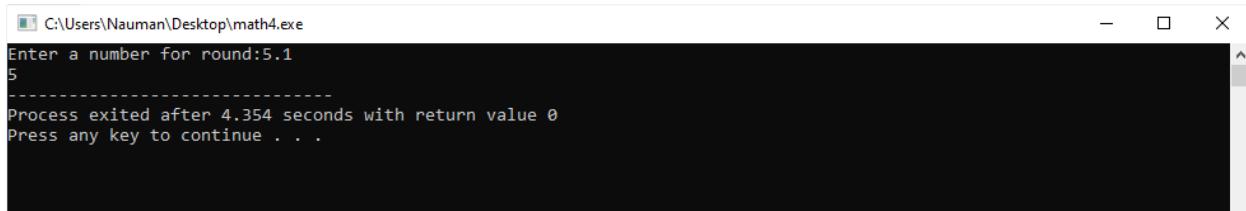
Code:

```
#include<iostream>
#include<cmath>
using namespace std;
void nint(float a)
{
    float r;
    r=round(a);
    cout<<r;
}
int main()
{
    float x;
    cout<<"Enter a number for round:";
    cin>>x;
    nint(x);
    return 0;
}
```

Output:



```
C:\Users\Nauman\Desktop\math4.exe
Enter a number for round:5.5
6
-----
Process exited after 4.699 seconds with return value 0
Press any key to continue . . .
```



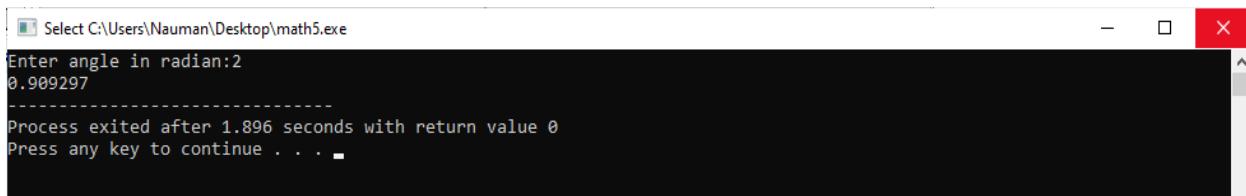
```
C:\Users\Nauman\Desktop\math4.exe
Enter a number for round:5.1
5
-----
Process exited after 4.354 seconds with return value 0
Press any key to continue . . .
```

➤ **sin(x) – sine**

Code:

```
#include<iostream>
#include<cmath>
using namespace std;
void sain(float a)
{
    float r;
    r=sin(a);
    cout<<r;
}
int main()
{
    float x;
    cout<<"Enter angle in radian:";
    cin>>x;
    sain(x);
    return 0;
}
```

Output:

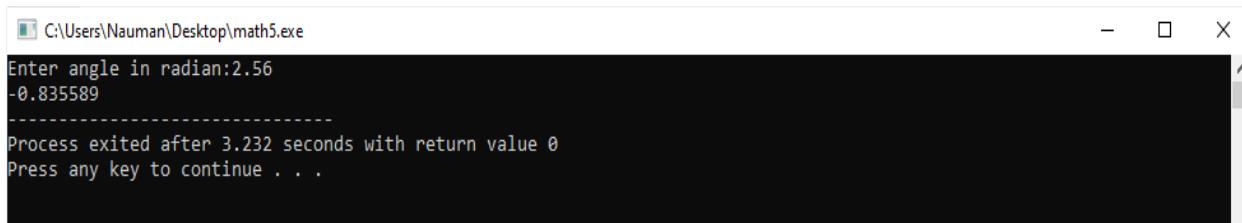


➤ $\cos(x)$ – cosine

Code:

```
#include<iostream>
#include<cmath>
using namespace std;
void co(float a)
{
    float r;
    r=cos(a);
    cout<<r;
}
int main()
{
    float x;
    cout<<"Enter angle in radian:";
    cin>>x;
    co(x);
    return 0;
}
```

Output:



The screenshot shows a terminal window titled 'C:\Users\Nauman\Desktop\math5.exe'. The window contains the following text:
Enter angle in radian:2.56
-0.835589

Process exited after 3.232 seconds with return value 0
Press any key to continue . . .

➤ $\tan(x)$ – tangent

Code:

```
#include<iostream>
```

```

#include<cmath>
using namespace std;
void ta(float a)
{
    float r;
    r=tan(a);
    cout<<r;
}
int main()
{
    float x;
    cout<<"Enter angle in radian:";
    cin>>x;
    ta(x);
    return 0;
}

```

Output:

```

C:\Users\Nauman\Desktop\math6.exe
Enter angle in radian:180
1.33869
-----
Process exited after 2.796 seconds with return value 0
Press any key to continue . . .

```

➤ log(x) – natural logarithm

Code:

```

#include<iostream>
#include<cmath>
using namespace std;
void lo(int a)

```

```

{
    int r;
    r=log(a);
    cout<<r;
}

int main()
{
    int x;
    cout<<"Enter number:";
    cin>>x;
    lo(x);
    return 0;
}

```

Output:

```

C:\Users\Nauman\Desktop\math7.exe
Enter number:8
2
-----
Process exited after 2.334 seconds with return value 0
Press any key to continue . .

```

➤ **log10(x) – base-10 logarithm**

Code:

```

#include<iostream>
#include<cmath>
using namespace std;
void lg(float a)
{
    float r;
    r=log10(a);
    cout<<r;
}

```

```

}

int main()
{
    float x;

    cout<<"Enter number:";

    cin>>x;

    lg(x);

    return 0;
}

```

Output:

```

C:\Users\Nauman\Desktop\math7.exe
Enter number:100
2
Process exited after 3.699 seconds with return value 0
Press any key to continue . . .

```

➤ exp(x) – exponential (e^x)

Code:

```

#include<iostream>

#include<cmath>

using namespace std;

void expo(float a)

{
    float r;

    r=exp(a);

    cout<<r;

}

int main()

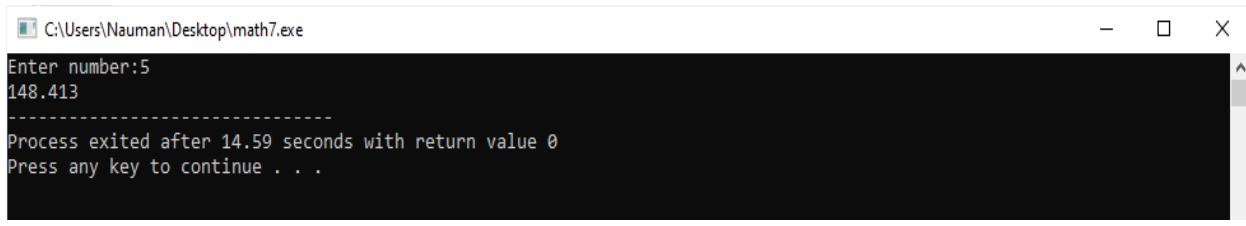
{
    float x;

    cout<<"Enter number:";


```

```
    cin>>x;
    expo(x);
    return 0;
}
```

Output:



```
C:\Users\Nauman\Desktop\math7.exe
Enter number:
148.413
-----
Process exited after 14.59 seconds with return value 0
Press any key to continue . . .
```

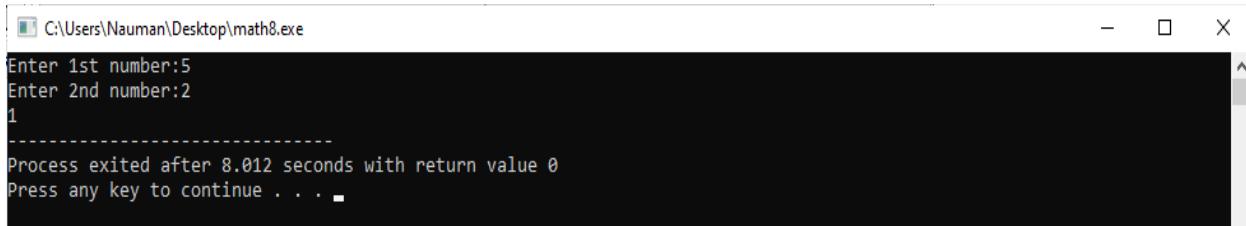
➤ **fmod(x, y) – remainder of division**

Code:

```
#include<iostream>
#include<cmath>
using namespace std;
void re(float a,float b)
{
    float r;
    r=fmod(a,b);
    cout<<r;
}
int main()
{
    float x,y;
    cout<<"Enter 1st number:";
    cin>>x;
    cout<<"Enter 2nd number:";
    cin>>y;
    re(x,y);
```

```
    return 0;  
}
```

Output:



```
C:\Users\Nauman\Desktop\math8.exe  
Enter 1st number:5  
Enter 2nd number:2  
1  
-----  
Process exited after 8.012 seconds with return value 0  
Press any key to continue . . .
```

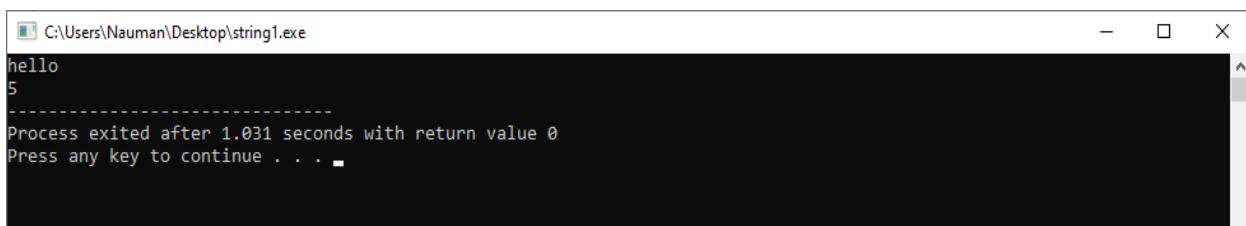
2) String Built-in Functions (<cstring>)

➤ **strlen(s) – find length of string**

Code:

```
#include<iostream>  
  
#include<cstring>  
  
using namespace std;  
  
int main()  
{  
    char a[]="hello";  
    cout<<a<<endl;  
    cout<<strlen(a);  
    return 0;  
}
```

Output:



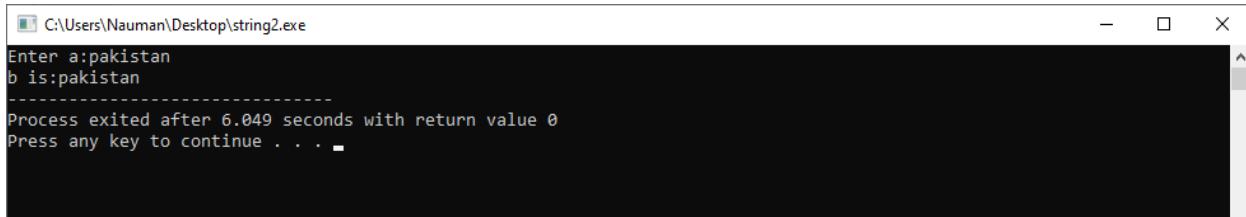
```
C:\Users\Nauman\Desktop\string1.exe  
hello  
5  
-----  
Process exited after 1.031 seconds with return value 0  
Press any key to continue . . .
```

➤ **strcpy(a, b) – copy string**

Code:

```
#include<iostream>
#include<cstring>
using namespace std;
int main()
{
    char a[10],b[10];
    cout<<"Enter a:";
    cin>>a;
    cout<<"b is:"<<strcpy(b,a);
    return 0;
}
```

Output:



➤ **strcat(a, b) – concatenate strings**

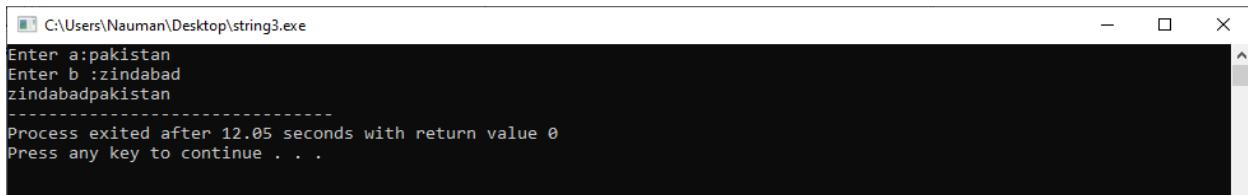
Code:

```
#include<iostream>
#include<cstring>
using namespace std;
int main()
{
```

```
char a[20],b[30];
cout<<"Enter a:";

cin>>a;
cout<<"Enter b :" ;
cin>>b;
cout<<strcat(b,a);
return 0;
}
```

Output:



```
C:\Users\Nauman\Desktop\string3.exe
Enter a:pakistan
Enter b :zindabad
zindabadpakistan
-----
Process exited after 12.05 seconds with return value 0
Press any key to continue . . .
```

➤ strcmp(a, b) – compare strings

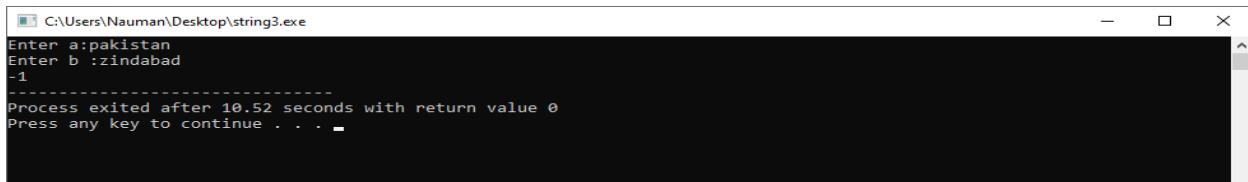
Code:

```
#include<iostream>
#include<cstring>
using namespace std;
int main()
{
    char a[20],b[30];
    cout<<"Enter a:";

    cin>>a;
    cout<<"Enter b :" ;
    cin>>b;
    cout<<strcmp(a, b);

    return 0;
}
```

Output:



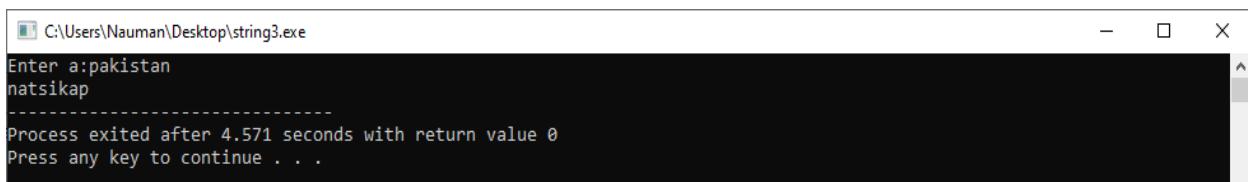
```
C:\Users\Nauman\Desktop\string3.exe
Enter a:akistan
Enter b :zindabad
-1
Process exited after 10.52 seconds with return value 0
Press any key to continue . . .
```

➤ `strrev(s)` – reverse string (compiler dependent)

Code:

```
#include<iostream>
#include<cstring>
using namespace std;
int main()
{
    char a[20];
    cout<<"Enter a:";
    cin>>a;
    cout<<strrev(a);
    return 0;
}
```

Output:



```
C:\Users\Nauman\Desktop\string3.exe
Enter a:akistan
natsikap
Process exited after 4.571 seconds with return value 0
Press any key to continue . . .
```

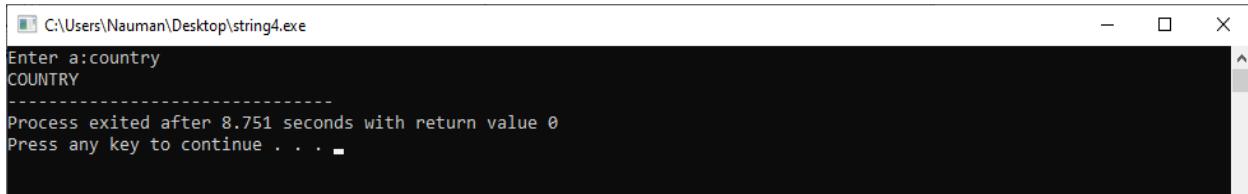
➤ `strupr(s)` – convert to uppercase (compiler dependent)

Code:

```
#include<iostream>
#include<cstring>
```

```
using namespace std;  
int main()  
{  
    char a[20];  
    cout<<"Enter a:";  
    cin>>a;  
    cout<<strupr(a) ;  
    return 0;  
}
```

Output:



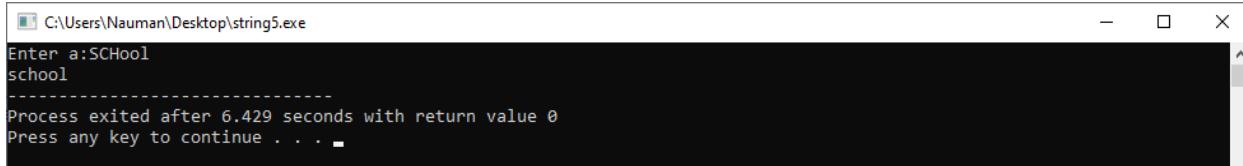
```
C:\Users\Nauman\Desktop\string4.exe  
Enter a:country  
COUNTRY  
-----  
Process exited after 8.751 seconds with return value 0  
Press any key to continue . . .
```

➤ **strlwr(s) – convert to lowercase (compiler dependent)**

Code:

```
#include<iostream>  
#include<cstring>  
using namespace std;  
int main()  
{  
    char a[20];  
    cout<<"Enter a:";  
    cin>>a;  
    cout<<strlwr(a) ;  
    return 0;  
}
```

Output:



```
C:\Users\Nauman\Desktop\string5.exe
Enter a:SCHOOL
school
Process exited after 6.429 seconds with return value 0
Press any key to continue . . .
```

3) Character Handling Functions (<cctype>)

- **toupper(c) – change to upper case**

Code:

```
#include<iostream>
#include<cctype>
using namespace std;
int main()
{
    char a;
    cout<<"Enter a:";

    cin>>a;
    cout<<(char)toupper(a) ;

    return 0;
}
```

Output:



```
C:\Users\Nauman\Desktop\char 2.exe
Enter a:D
D
Process exited after 2.6 seconds with return value 0
Press any key to continue . . .
```

-
- **tolower(c) – change to lower case**

Code:

```
#include<iostream>
```

```
#include<cctype>
using namespace std;
int main()
{
    char a;
    cout<<"Enter a:" ;
    cin>>a;
    cout<<(char)tolower(a) ;
    return 0;
}
```

Output:

```
C:\Users\Nauman\Desktop\char 2.exe
Enter a:T
t
-----
Process exited after 2.927 seconds with return value 0
Press any key to continue . . .
```

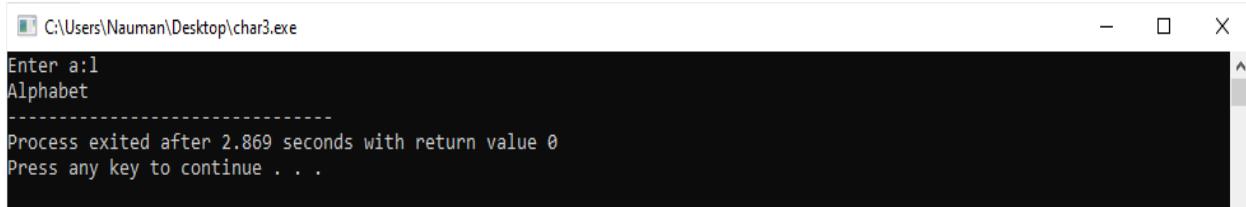
➤ **isalpha(c) – check if alphabet**

Code:

```
#include<iostream>
#include<cctype>
using namespace std;
int main()
{
    char a;
    cout<<"Enter a:" ;
    cin>>a;
    if((char)isalpha(a))
        cout<<"Alphabet";
    else
        cout<<"Not an alphabet";
```

```
    return 0;  
}
```

Output:



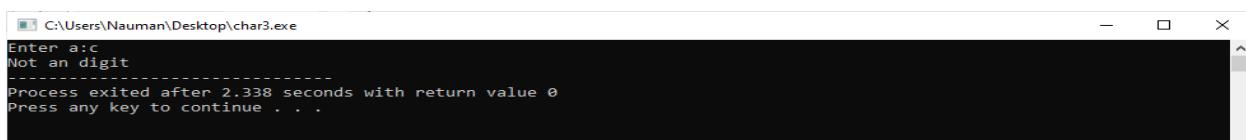
```
C:\Users\Nauman\Desktop\char3.exe  
Enter a:1  
Alphabet  
-----  
Process exited after 2.869 seconds with return value 0  
Press any key to continue . . .
```

➤ **isdigit(c) – check if digit**

Code:

```
#include<iostream>  
  
#include<cctype>  
  
using namespace std;  
  
int main()  
{  
    int a;  
  
    cout<<"Enter a:";  
  
    cin>>a;  
  
    if(isdigit(a))  
        cout<<"Digit";  
    else  
        cout<<"Not an digit";  
  
    return 0;  
}
```

Output:



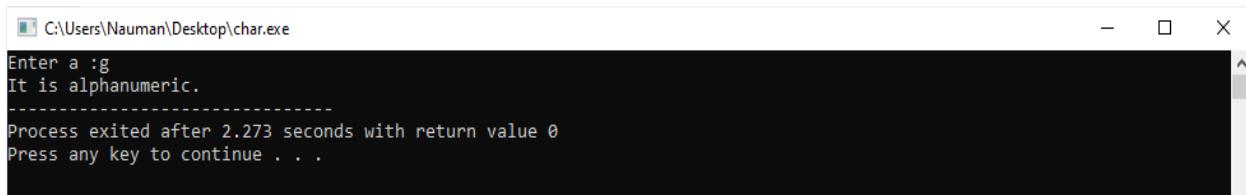
```
C:\Users\Nauman\Desktop\char3.exe  
Enter a:c  
Not an digit  
-----  
Process exited after 2.338 seconds with return value 0  
Press any key to continue . . .
```

➤ **isalnum(c) – check if alphanumeric**

Code:

```
#include<iostream>
#include<cctype>
using namespace std;
int main()
{
    char a;
    cout<<"Enter a :";
    cin>>a;
    if(isalnum(a))
        cout<<"It is alphanumeric.";
    else
        cout<<"It is not alphanumeric.";
    return 0;
}
```

Output:



```
C:\Users\Nauman\Desktop\char.exe
Enter a :g
It is alphanumeric.
-----
Process exited after 2.273 seconds with return value 0
Press any key to continue . . .
```

➤ **isspace(c) – check if space**

Code:

```
#include<iostream>
#include<cctype>
using namespace std;
int main()
{
```

```

char a;
cout<<"Enter a :";
cin>>a;
if(isspace(a))
cout<<"Yes their is a space.";
else
cout<<"Yes their is a space.";
return 0;
}

```

Output:

```

C:\Users\Nauman\Desktop\char4.exe
Enter a :g
Yes their is a space.
Process exited after 4.102 seconds with return value 0
Press any key to continue . . .

```

➤ **isupper(c) – check upper case**

Code:

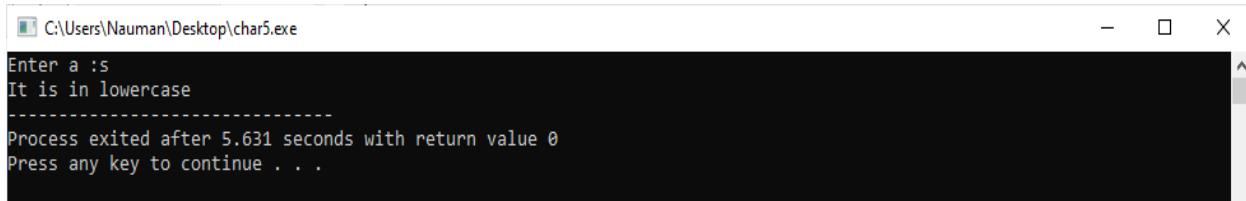
```

#include<iostream>
#include<cctype>
using namespace std;
int main()
{
    char a;
    cout<<"Enter a :";
    cin>>a;
    if(isupper(a) )
        cout<<"It is in UPPERCASE.";
    else
        cout<<"It is in lowercase";
}

```

```
    return 0;  
}
```

Output:



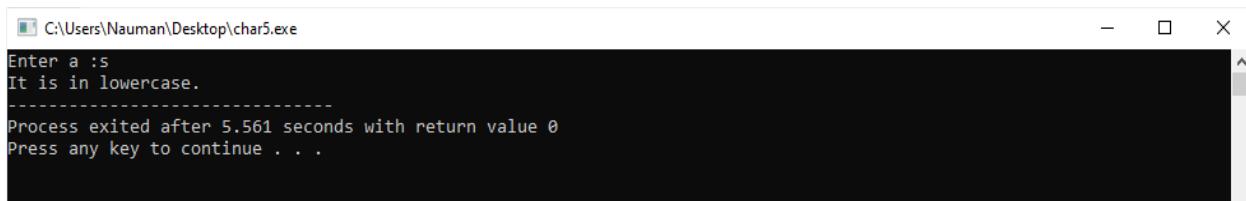
```
C:\Users\Nauman\Desktop\char5.exe  
Enter a :s  
It is in lowercase  
-----  
Process exited after 5.631 seconds with return value 0  
Press any key to continue . . .
```

➤ **islower(c) – check lower case**

Code:

```
#include<iostream>  
  
#include<cctype>  
  
using namespace std;  
  
int main()  
{  
    char a;  
    cout<<"Enter a :";  
    cin>>a;  
    if(islower(a))  
        cout<<"It is in lowercase.";  
    else  
        cout<<"It is in UPPERCASE";  
    return 0;  
}
```

Output:



```
C:\Users\Nauman\Desktop\char5.exe  
Enter a :s  
It is in lowercase.  
-----  
Process exited after 5.561 seconds with return value 0  
Press any key to continue . . .
```

4) Input / Output Functions (<iostream>)

➤ cin – input

Code:

```
#include<iostream>

using namespace std;

int main()

{

    int a,b;

    cout<<"Enter 1st number: ";

    cin>>a;

    cout<<"Enter 2nd number: ";

    cin>>b;

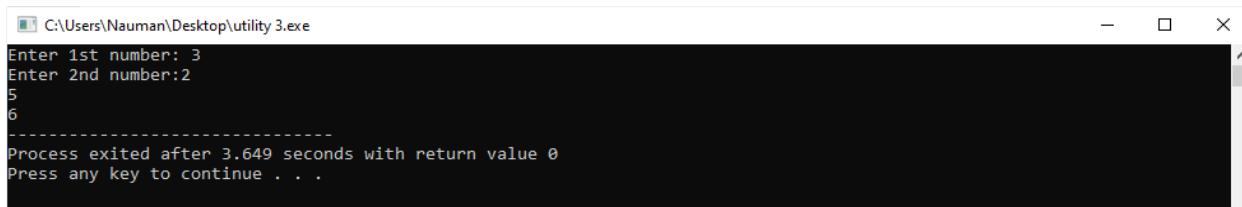
    cout<<a+b<<endl;

    cout<<a*b;

    return 0;

}
```

Output:



➤ cout – output

Code:

```
#include<iostream>
```

```
using namespace std;
```

```
int main()
{
    int a=4,b=2,sum,mul;
    sum=a+b;
    mul=a*b;
    cout<<sum<<endl;
    cout<<mul;
    return 0;
}
```

Output:



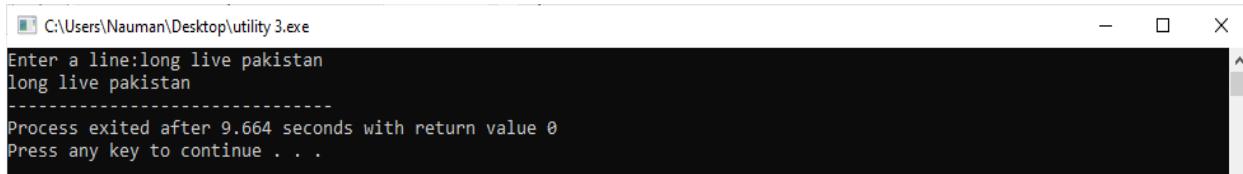
```
C:\Users\Nauman\Desktop\utility 3.exe
6
8
-----
Process exited after 1.01 seconds with return value 0
Press any key to continue . . .
```

➤ **getline(cin, s) – input a complete line**

Code:

```
#include<iostream>
using namespace std;
int main()
{
    string a,b;
    cout<<"Enter a line:";
    getline(cin,a);
    cout<<a;
    return 0;
}
```

Output:



```
C:\Users\Nauman\Desktop\utility 3.exe
Enter a line:long live pakistan
long live pakistan
-----
Process exited after 9.664 seconds with return value 0
Press any key to continue . . .
```

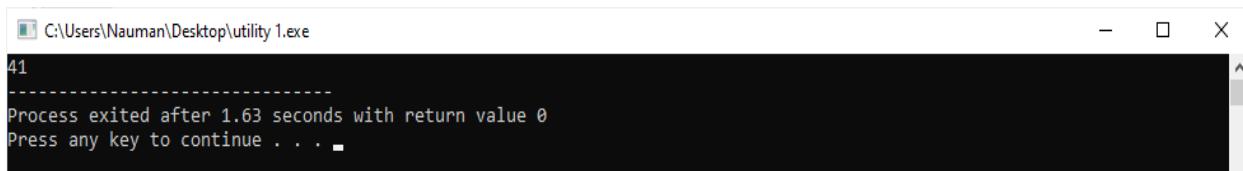
5) General Utility Functions (<cstdlib>)

➤ rand() – generate random number

Code:

```
#include<iostream>
#include<cstdlib>
using namespace std;
int main()
{
    int r;
    r=rand();
    cout<<r;
    return 0;
}
```

Output:



```
C:\Users\Nauman\Desktop\utility 1.exe
41
-----
Process exited after 1.63 seconds with return value 0
Press any key to continue . . .
```

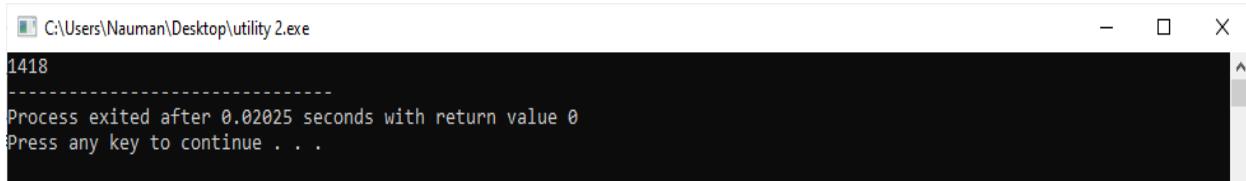
➤ srand() – set seed for random number

Code:

```
#include<iostream>
#include<cstdlib>
```

```
#include<ctime>
using namespace std;
int main()
{
    int r;
    srand(time(0));
    r=rand();
    cout<<r;
    return 0;
}
```

Output:



```
C:\Users\Nauman\Desktop\utility 2.exe
1418
-----
Process exited after 0.02025 seconds with return value 0
Press any key to continue . . .
```

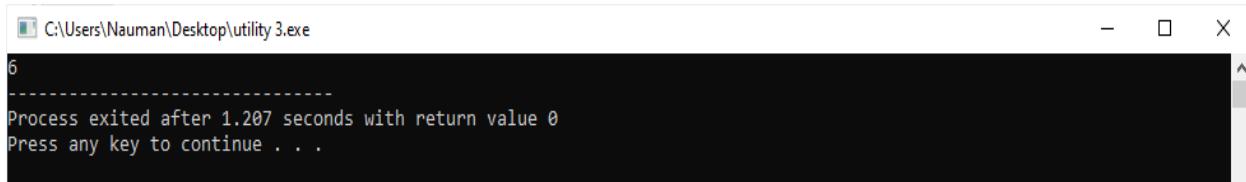
➤ **exit() – terminate program**

Code:

```
#include<iostream>
#include<cstdlib>
using namespace std;
int main()
{
    int a=4,b=2,sum,mul;
    sum=a+b;
    mul=a*b;
    cout<<sum;
    exit(0);
    cout<<mul;
```

```
    return 0;  
}
```

Output:



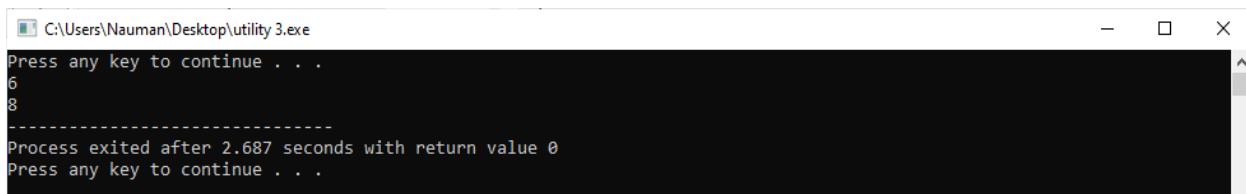
```
6  
-----  
Process exited after 1.207 seconds with return value 0  
Press any key to continue . . .
```

➤ system() – run system command

Code:

```
#include<iostream>  
  
#include<cstdlib>  
  
using namespace std;  
  
int main()  
{  
    int a=4,b=2,sum,mul;  
    sum=a+b;  
    mul=a*b;  
    system("pause");  
    cout<<sum<<endl;  
    cout<<mul;  
    return 0;  
}
```

Output:



```
Press any key to continue . . .  
6  
8  
-----  
Process exited after 2.687 seconds with return value 0  
Press any key to continue . . .
```