



Govt.College Women University
Faisalabad

PROGRAMMING FUNDAMENTALS

Assignment no 2

Course Code: CSC-311

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Built-in-Functions

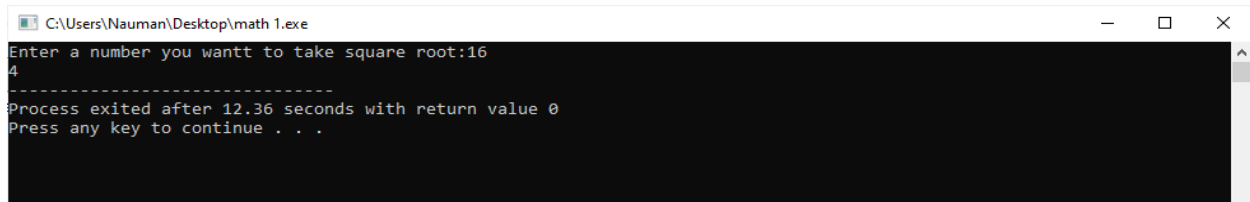
1) Mathematical Built-in Functions (<cmath>)

➤ 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 want 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:

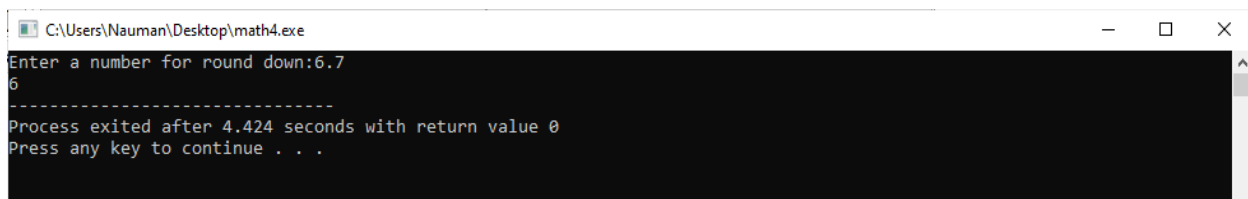
```
C:\Users\Nauman\Desktop\math3.exe
Enter a number for round up:6.7
7
-----
Process exited after 7.789 seconds with return value 0
Press any key to continue . . .
```

➤ 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:

A screenshot of a Windows command prompt window titled "C:\Users\Nauman\Desktop\math4.exe". The window has standard Windows window controls (minimize, maximize, close) in the top right corner. The command prompt shows the following text: "Enter a number for round down:6.7", followed by "6" on the next line. A dashed line separates the input from the output. Below the dashed line, it says "Process exited after 4.424 seconds with return value 0" and "Press any key to continue . . .".

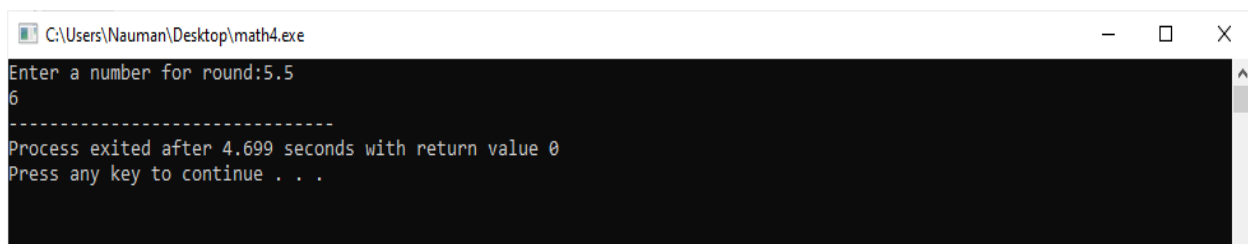
```
C:\Users\Nauman\Desktop\math4.exe
Enter a number for round down:6.7
6
-----
Process exited after 4.424 seconds with return value 0
Press any key to continue . . .
```

➤ round(x) – nearest integer

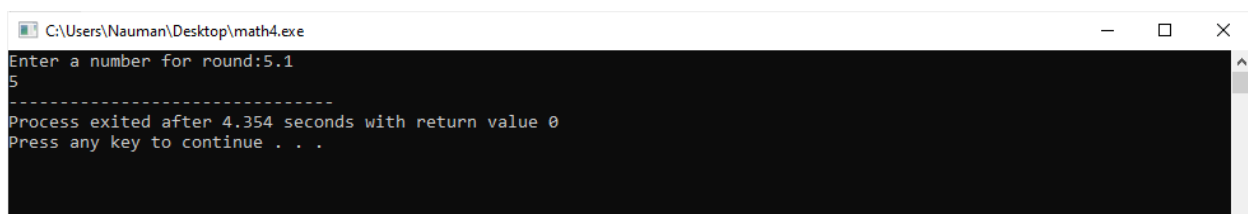
Code:

```
#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 . . .
```



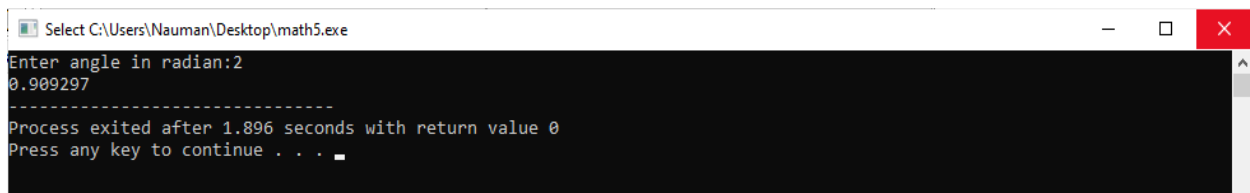
```
C:\Users\Nauman\Desktop\math4.exe
Enter a number for round:5.1
5
-----
Process exited after 4.354 seconds with return value 0
Press any key to continue . . .
```

➤ $\sin(x)$ – 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:



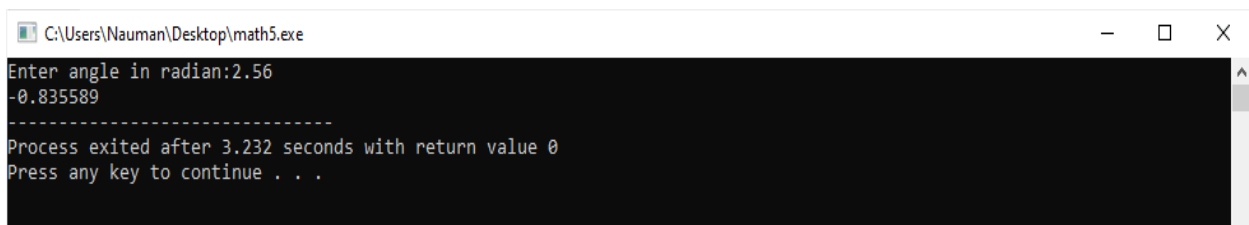
```
Select C:\Users\Nauman\Desktop\math5.exe
Enter angle in radian:2
0.909297
-----
Process exited after 1.896 seconds with return value 0
Press any key to continue . . .
```


➤ **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:



```
C:\Users\Nauman\Desktop\math5.exe
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:

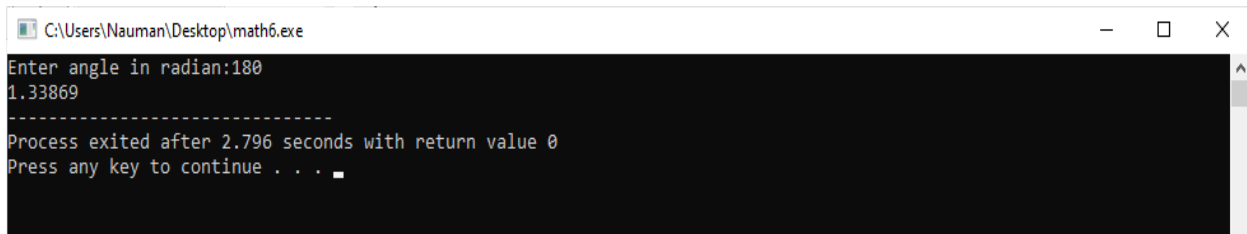
```
#include<iostream>
```

```

#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)

```

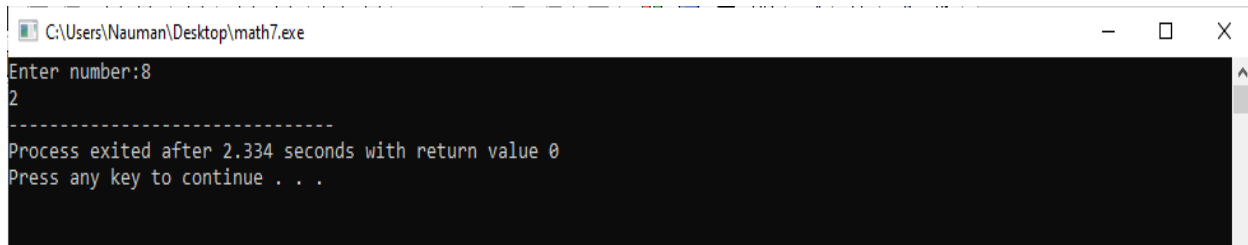
```

{
    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;
}

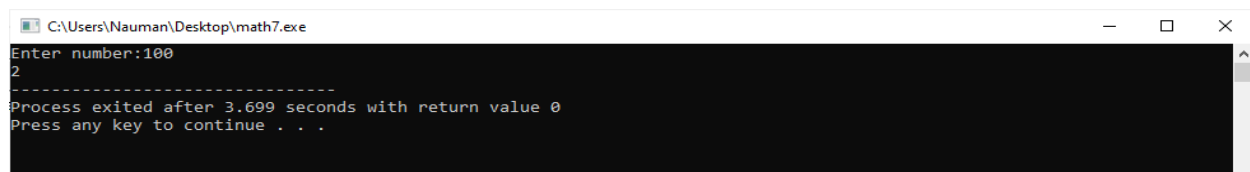
```

```

}
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;

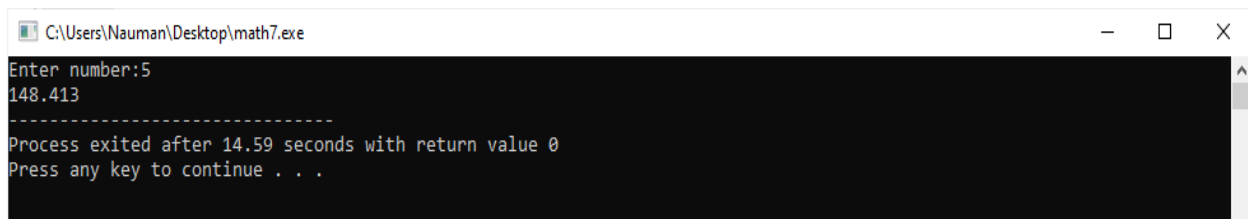
        expo(x);

        return 0;

}

```

Output:



```

C:\Users\Nauman\Desktop\math7.exe
Enter number:5
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:";

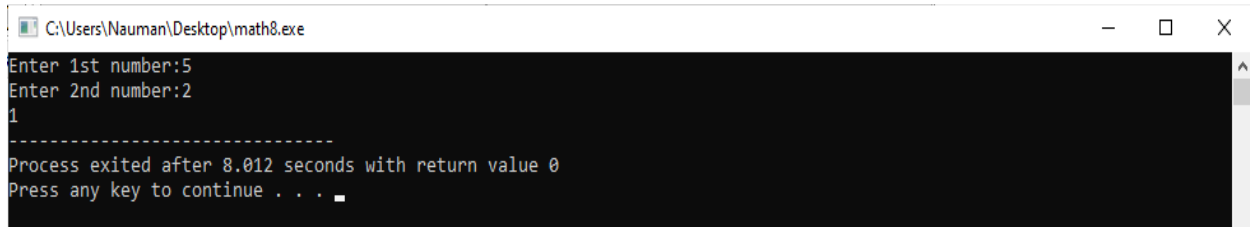
    cin>>y;

    re(x,y);
}

```

```
    return 0;
}
```

Output:



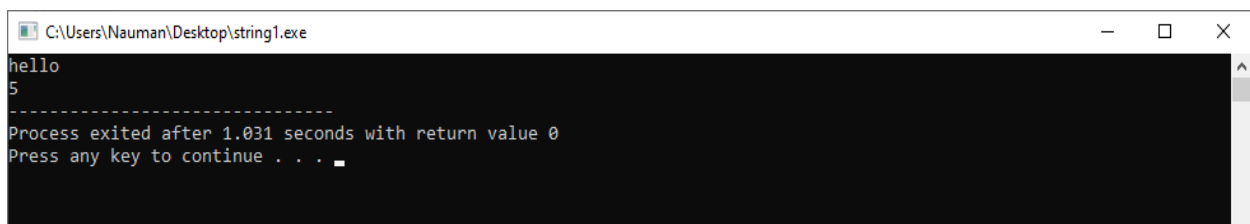
2) String Built-in Functions (<cstring>)

➤ 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:

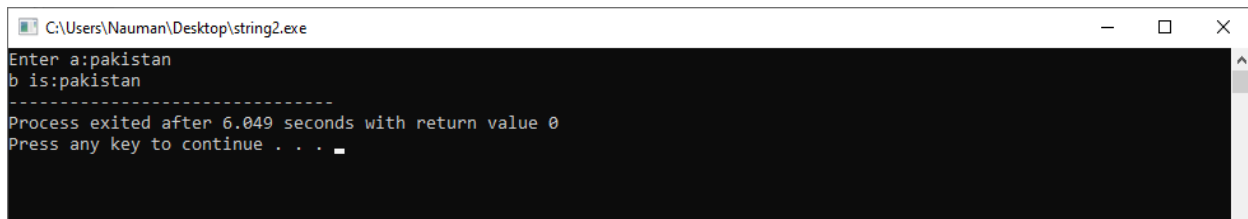


➤ strcpy(a, b) – copy string

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:

A screenshot of a Windows command prompt window titled "C:\Users\Nauman\Desktop\string2.exe". The window has standard Windows window controls (minimize, maximize, close) in the top right corner. The command prompt shows the following text: "Enter a:pakistan", "b is:pakistan", a separator line of dashes, "Process exited after 6.049 seconds with return value 0", and "Press any key to continue . . .". A cursor is visible at the end of the last line.

```
C:\Users\Nauman\Desktop\string2.exe
Enter a:pakistan
b is:pakistan
-----
Process exited after 6.049 seconds with return value 0
Press any key to continue . . .
```

➤ 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;

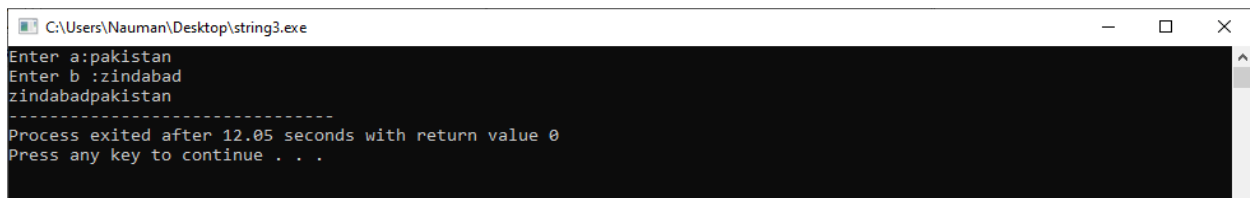
    cout<<strcat(b,a);

    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;

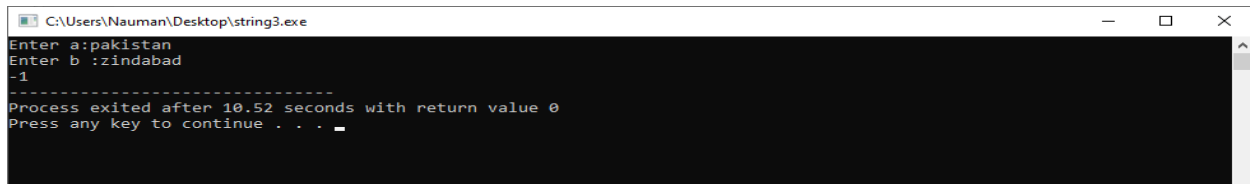
    cout<<strcmp(a, b);

    return 0;

}

```


Output:

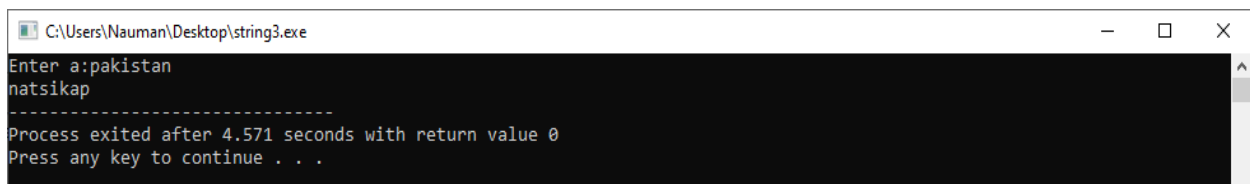


➤ **strrev(s) – reverse string (compiler dependent)**

Code:

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

Output:



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

Code:

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

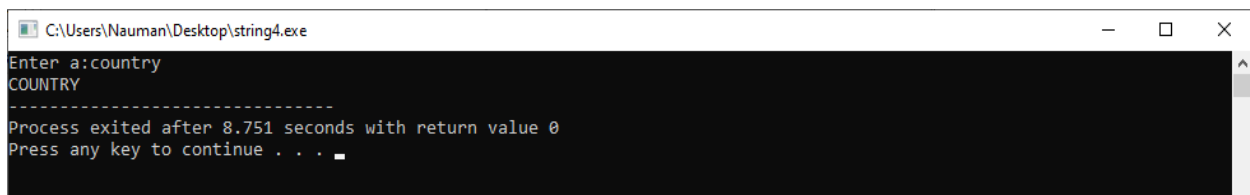
```

using namespace std;

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

```

Output:



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

Code:

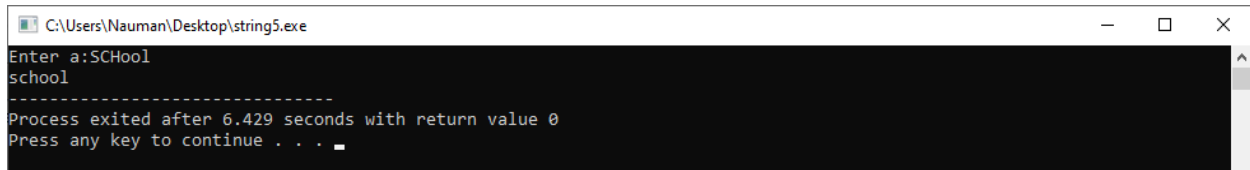
```

#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 . . . _
```

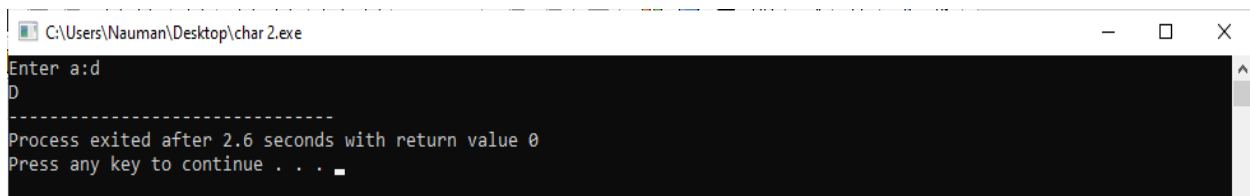
3) Character Handling Functions (<cctype>)

➤ 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:

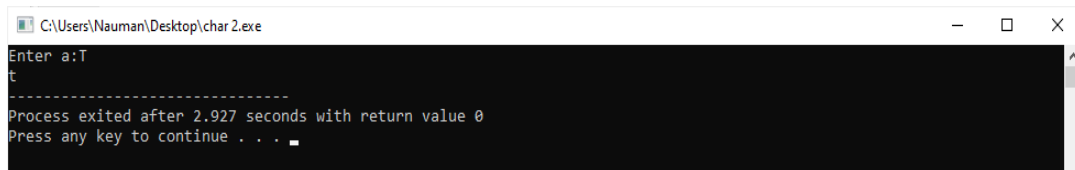
```
#include<iostream>
```

```

#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:

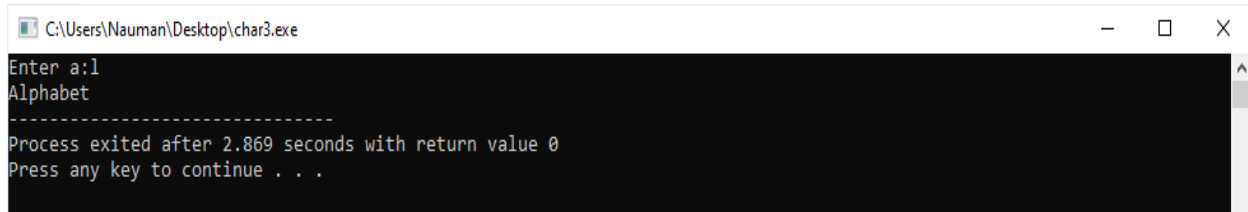
```

#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:



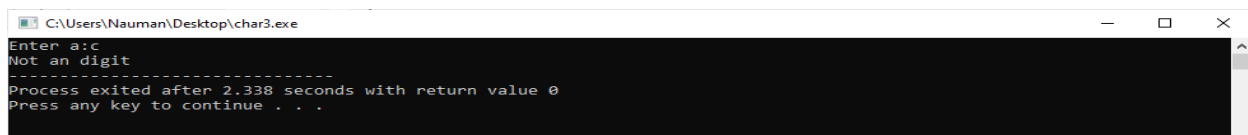
```
C:\Users\Nauman\Desktop\char3.exe
Enter a:l
Alphabet
-----
Process exited after 2.869 seconds with return value 0
Press any key to continue . . .
```

➤ 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:



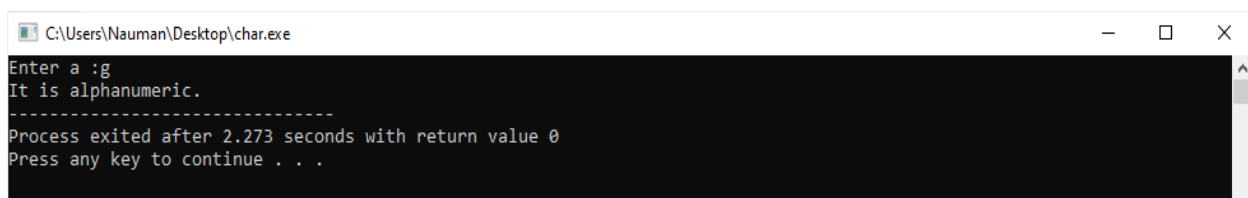
```
C:\Users\Nauman\Desktop\char3.exe
Enter a:c
Not an digit
-----
Process exited after 2.338 seconds with return value 0
Press any key to continue . . .
```

➤ 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

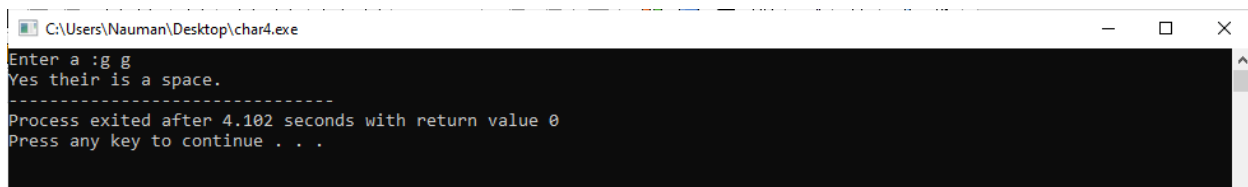
cout<<"Yes their is a space.";

return 0;

}

```

Output:



```

C:\Users\Nauman\Desktop\char4.exe
Enter a :g 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.";

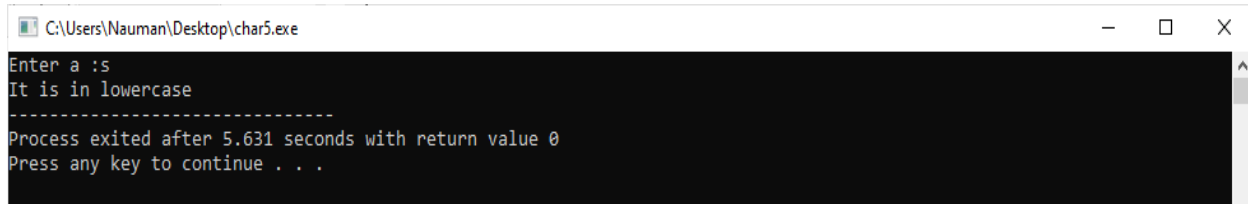
else

cout<<"It is in lowercase";

```

```
        return 0;
    }
}
```

Output:



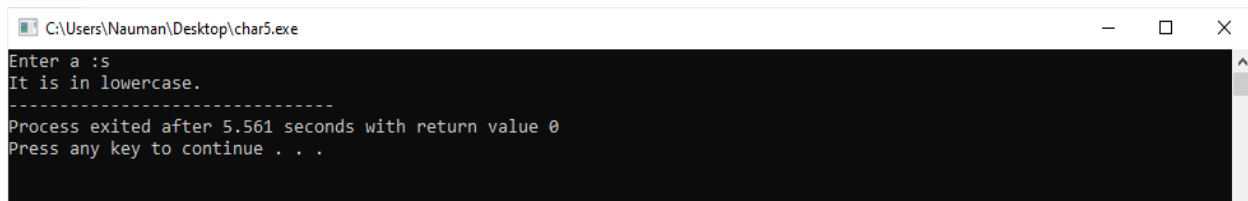
```
C:\Users\Nauman\Desktop\char5.exe
Enter a :s
It is in lowercase
-----
Process exited after 5.631 seconds with return value 0
Press any key to continue . . .
```

➤ 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

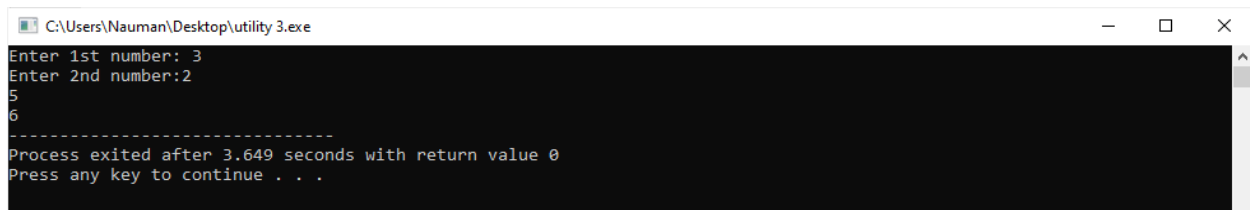
Code:

```
#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:



```
C:\Users\Nauman\Desktop\utility 3.exe
Enter 1st number: 3
Enter 2nd number:2
5
6
-----
Process exited after 3.649 seconds with return value 0
Press any key to continue . . .
```

➤ cout – output

Code:

```
#include<iostream>

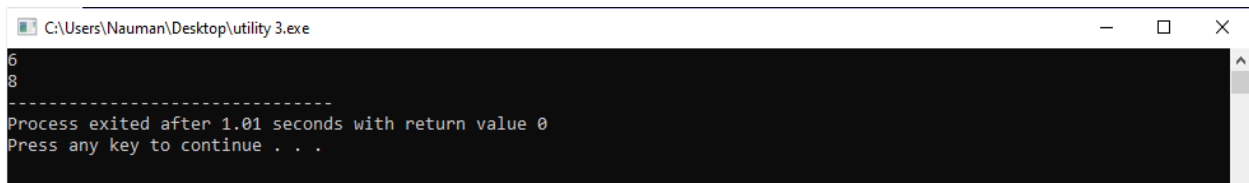
using namespace std;
```

```

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

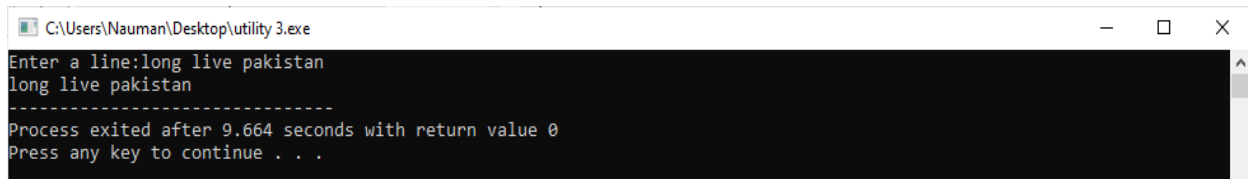
Code:

```

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

```

Output:



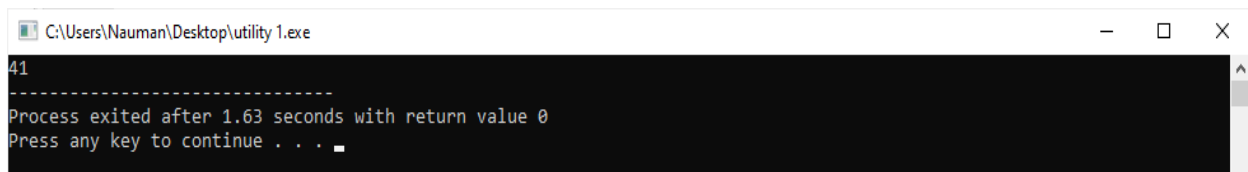
5) General Utility Functions (<cstdlib>)

➤ rand() – generate random number

Code:

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

Output:



➤ srand() – set seed for random number

Code:

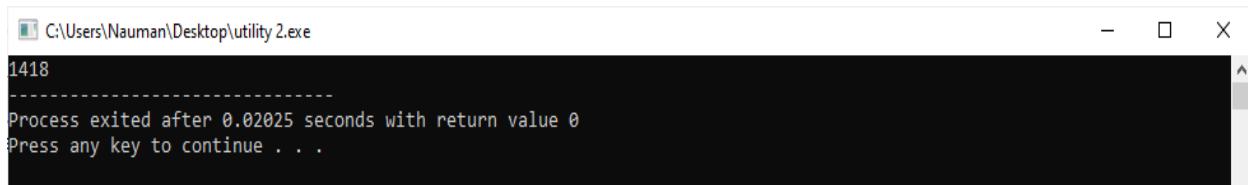
```
#include<iostream>
#include<cstdlib>
```

```

#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:

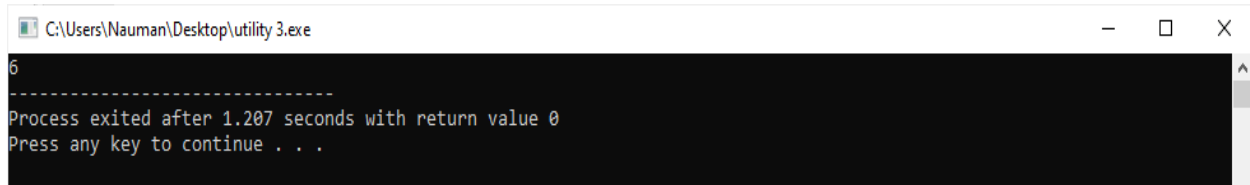
```

#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:



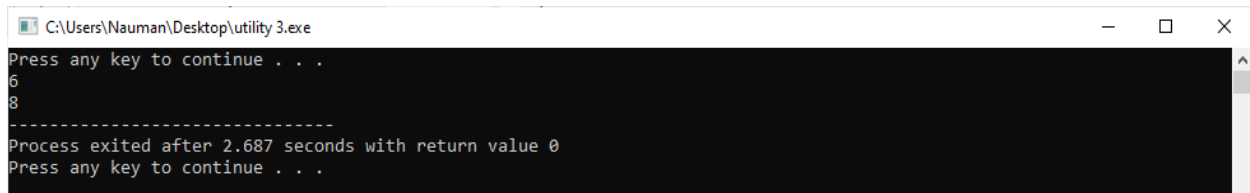
```
C:\Users\Nauman\Desktop\utility 3.exe
6
-----
Process exited after 1.207 seconds with return value 0
Press any key to continue . . .
```

➤ 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:



```
C:\Users\Nauman\Desktop\utility 3.exe
Press any key to continue . . .
6
8
-----
Process exited after 2.687 seconds with return value 0
Press any key to continue . . .
```