1. Write a function which calculates & returns area of the circle. Radius should be your function parameter. Take appropriate data types.
   Code:

```cpp
#include <iostream>
using namespace std;

#define PI 3.142

double cal_radius(float r)
{
	double area;
	area = PI * r * r;
	return area;
}
int main()
{
	float rad;
	cout << "Enter the radius of circle: ";
	cin >> rad;
	cout << "Area of circle is: " << cal_radius(rad);
	cout << endl;
	return 0;
}
```

   Output:

```
Enter the radius of circle: 12
Area of circle is: 452.448
```

2. Write a function that accepts an integer argument and tests it to be even or odd. The function returns true if the argument is even and false if the argument is odd; and displays the corresponding output. The return value should be of type bool. In main take an integer input from user and pass it to the function.
   Code:

```cpp
#include <iostream>
using namespace std;

bool even_odd(int);

int main()
{
	int num;
	cout << "Enter any number: ";
	cin >> num;
	cout << "Return 0 if number is even else 1: " << even_odd(num);
	cout << endl;
	return 0;
}

bool even_odd(int n)
{
	if (n % 2)
	{
		return false;
	}
	else
	{
		return true;
```

```
	}
	}
```

Output:

```
Enter any number: 64
Return 0 if number is even else 1: 1
```

3. Write a function that receives integer base and exponent as function arguments and calculates the result of the expression and return results to main function and display on console. result=Base ^ exponent For Example: Base=5 Exponent=3, output = 125

Code:

```
#include <iostream>
using namespace std;

int cal_result(int, int);

int main()
{
	int base, exp;
	cout << "Enter the base: ";
	cin >> base;
	cout << "Enter the exponent: ";
	cin >> exp;
	cout << "Result: " << cal_result(base, exp);
	cout << endl;
	return 0;
}

int cal_result(int b, int e)
{
	int res;
	res = pow(b, e);
	return res;
}
```

Output:

```
Enter the base: 5
Enter the exponent: 3
Result: 125
```

4. Write a function which swaps two integers variables Pass two variables as function arguments. Display results after swapping with in function body so return type of your function should be void.

Code:

```
#include <iostream>
using namespace std;

void swap(int& num1,int& num2)
{
	int temp;
	cout << "\nNumbers before swapping!";
	cout << "\nFirst number: " << num1;
	cout << "\nSecond number: " << num2;
	temp = num1;
	num1 = num2;
	num2 = temp;
	cout << "\nNumbers after swapping!";
	cout << "\nFirst number: " << num1;
```

```
        cout << "\nSecond number: " << num2;

}
int main()
{
        int a, b;
        cout << "Enter the first number: ";
        cin >> a;
        cout << "Enter the second number: ";
        cin >> b;
        swap(a, b);
        cout << endl;
        return 0;
}
```

Output:

```
Enter the first number: 13
Enter the second number: 23

Numbers before swapping!
First number: 13
Second number: 23
Numbers after swapping!
First number: 23
Second number: 13
```

5. Write a program to pass a string to a function and then to find out its length.
   Code:

```
#include <iostream>
using namespace std;
void find_string_length(string);

int main()
{
        string str;
        cout << "Enter the string! ";
        cin >> str;
        find_string_length(str);
        cout << endl;
        return 0;
}
void find_string_length(string s)
{
        int len;
        len = s.size();
        cout << "Length of the string: " << len;
}
```

Output:

```
Enter the string! ahsanali
Length of the string: 8
```

6. Write a function named times Ten. The function should have an integer parameter named number. When times Ten is called, it should display the product of number times ten. (Note: just write the function. Do not write a complete program.)
   Code:

```
#include <iostream>
using namespace std;
```

```
int ten_times(int);

int main()
{
	int num;
	cout << "Enter any number! ";
	cin >> num;
	cout << ten_times(num);
	cout << endl;
	return 0;
}
int ten_times(int n)
{
	int prod = 1;
	for (int i = 1; i <= 10; i++)
	{
		prod = prod * n;
	}
	return prod;
}
```

Output:

```
Enter any number! 2
1024
```

7. Write a program with a function that takes two int parameters, adds them together, then returns the sum. The program should ask the user for two numbers, then call the function with the numbers as arguments, and tell the user the sum.
Code:

```
#include <iostream>
using namespace std;
int addition(int, int);

int main()
{
	int num1, num2;
	cout << "Enter the first number! ";
	cin >> num1;
	cout << "Enter the second number! ";
	cin >> num2;
	cout << "Sum of two numbers is: " << addition(num1, num2);
	return 0;
}
int addition(int n1, int n2)
{
	int sum = 0;
	sum = n1 + n2;
	return sum;
}
```

Output:

```
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Enter the first number! 45
Enter the second number! 78
Sum of two numbers is: 123
```

8. Write a function which converts an uppercase letter 'A'{'Z' to the corresponding lowercase letter. If the parameter is not a letter it must be returned unchanged. Write a main program which calls the function.
   Code:

```
#include <iostream>
using namespace std;
char upper_to_lower(char);

int main()
{
	char ch;
	cout << "Enter the uppercase letter! ";
	cin >> ch;

	cout << "The correspondance lower case letter of " << ch << " is: "
<< upper_to_lower(ch);
	cout << endl;
	return 0;
}
char upper_to_lower(char c)
{
	char lc;

	if (c >= 65 && c <= 90)
	{
		lc = c + 32;
		return lc;
	}
	else
	{
		return c;
	}

}
```

   Output:

```
Enter the uppercase letter! M
The correspondance lower case letter of M is: m
```

```
Enter the uppercase letter! k
The correspondance lower case letter of k is: k
```