(FUNCTIONS PROBLEM SOLUTIONS)

(MADE BY ALI AKBER)

(BSCS IST SS1)

Problem 9.1

Write a program that displays a message "Programming makes life interesting" on screen using function.

```
#include <iostream>

using namespace std;

void show(void);

int main ()

{

show();

return 0;

}

void show()

{

cout<<"Programming makes life interesting"<<endl;

}
```

Problem 9.2

Write a program that inputs two numbers in main() function.passes these numbers to a function.The function displays the maximum number.

```
#include <iostream>

using namespace std;

void max(int a,int b);

int main ()

{

int n1,n2;
```

```
cout<<"enter two numbers"<<endl;

cin>>n1>>n2;

max (n1,n2);

return 0;

}

void max(int a,int b)

{

if (a<b)

cout<<"Maximum number is "<<b<<endl;

else

cout<<"Maximum number is "<<a<<endl;

}
```

Problem 9.3

Write a program that inputs two numbers in main() function.passes these numbers to a function.The function displays the table of that number.

```
#include <iostream>

using namespace std;

void tab(int a);

int main ()

{

int n1;

cout<<"enter numbers"<<endl;

cin>>n1;

tab (n1);

return 0;

}
```

```
void tab(int a)

{

for (int i=1; i<=10; i++)

{

cout<<a<<"*"<<i<<"="<<a*i<<endl;

}

}
```

Problem 9.4

Write a program that inputs two numbers in main() function.passes these numbers to a function.The function displays the precedor and succesor of the number.

```
#include <iostream>

using namespace std;

void num(int);

int main ()

{

int n;

cout<<"enter number"<<endl;

cin>>n;

num (n);

return 0;

}

void num(int n)

{

int p,s;

p=n-1;

cout<<"preceding number is "<<p<<endl;
```

```
s=n+1;

cout<<"succeding number is "<<s<<endl;


}
```

Problem 9.5

Write a program that inputs two numbers in main() function.passes these numbers to a function.The function displays the factorial of the number.

```
#include <iostream>

using namespace std;

void num(int);

int main ()

{

int n;

cout<<"enter number"<<endl;

cin>>n;

num (n);

return 0;

}

void num(int n)

{

int fact=1;

for (int i=1; i<=n ; i++)

{

fact= fact*i;

}
```

```
cout<< "factorial of the number "<<n<<" is "<< fact<<endl;
}
```

Problem 9.6

Write a program to check whether the number is

prime even,

odd prime,

even number but not prime,

only an odd number not prime

or not.

```
#include <iostream>
using namespace std;
void chk_num(int);
int main ()
{
int n;
cout<<"enter a number"<<endl;
cin>>n;
cout<<"nature of number is"<<endl;
cout<<"--------------------"<<endl;
chk_num(n);
return 0;
}
        void chk_num(int n){
            int c=0,i;
                        for(i=2;i<n;i++){
if(n%i==0)
```

```
  c=1;
}
if(n%2==0 && c==0)
cout<<n<<" is a prime even number: ";
  else if(n%2!=0 && c==0)
cout<<n<<" is a odd prime number.";
else if(n%2==0 && c!=0)
cout<<n<<" is only an even number, not prime.";
else if(n%2!=0)
cout<<n<<" is only an odd number, not prime.";
else
cout<<" is not a prime number.";
            }
```

Problem 9.7

Write a program that inputs two numbers and one arithmetic operator in main function and passes them to a function. The function applies arithmetic operation on two numbers on the basis of the operator entered by user using switch statement.

```
#include <iostream>
using namespace std;
void operation(int,int,char);
int main ()
{
int n1,n2;
char ch;
cout<<"enter ist number"<<endl;
cin>>n1;
```

```
cout<<"enter 2nd number"<<endl;
cin>>n2;
cout<<"enter an operator"<<endl;
cin>>ch;
operation(n1,n2,ch);
return 0;
}
	void operation(int n1,int n2,char ch){
	switch(ch)
	    {
			case '+':
			cout<<n1<<"+"<<n2<<"="<<n1+n2;
			break;
				case '-':
			cout<<n1<<"-"<<n2<<"="<<n1-n2;
			break;
			case '/':
			cout<<n1<<"/"<<n2<<"="<<n1/n2;
			break;
			case '*':
			cout<<n1<<"*"<<n2<<"="<<n1*n2;
			break;
			case '%':
			cout<<n1<<"%"<<n2<<"="<<n1%n2;
			break;
```

```
        }
}
```

Problem 9.8

Write a program that displays a square of characters using function. The program inputs a number and a character in main function and passes them to function. For example, if the user enters 3 and @, the function displays the following 3 rows of the symbol @:

```
#include <iostream>

using namespace std;

void symbol(int,char);

int main ()

{

int n;

char ch;

cout<<"enter a number"<<endl;

cin>>n;

cout<<"enter a    character"<<endl;

cin>>ch;

symbol(n,ch);

return 0;

}

    void symbol(int n,char ch){

    for (int i=1;i<=n;i++)

    {

    cout<<endl;

    for(int k=1; k<=n; k++)

    {

    cout<<ch;
```

```
    }

    }
```

Problem 9.9

Write a program that accepts two integer numbers in main(). Define a function SWAP () which accept integer values as an arguments. Function swap the value of these numbers and print them after swapping in main(). Call this function from main().

```
#include <iostream>

using namespace std;

void num(int,int);

int main ()

{

    int n1,n2;

    cout<<"enter two number"<<endl;

    cin>>n1>>n2;

    cout<<"Value of n1 before swapping"<<" = "<<n1<<endl;

    cout<<"Value of n2 before swapping"<<" = "<<n2<<endl;

    cout<<endl;

    num (n1,n2);


    return 0;

}

void num(int n1,int n2)

{

    int temp=0;

    temp=n1;

    n1=n2;
```

```
    n2=temp;
    cout<<"Value of    n1 after swapping is "<<n1<<endl;
    cout<<"Value of    n2 after swapping is "<<n2<<endl;
}
```

Problem 9.10

Write a program that inputs mark in main function and pass the mark to a function. The function finds grade of student on the basis of the following criteria

Grade A 80 or above marks

Grade B 60 to 79 marks

Grade C 40 to 59 mark

Grade D Below 40 marks

```
#include <iostream>
using namespace std;
char grade(int n);
int main ()
{
int marks;
char g;
cout<<"enter number obtained by student"<<endl;
cin>>marks;
g=grade(marks);
cout<<"your grade is "<<g<<endl;
return 0;
}
char grade(int n)
```

```
{
if (n>=80)
return 'A';
else if (n>=60)
return 'B';
else if (n>=40)
return 'C';
else
return 'F';
}
```

Problem 9.11

Write a program that uses a function mulfint, int) to determine for a pair of integers whether the second integer is a multiple of the first. The function should take two integers arguments and return 1 (true) if second is a mulitple of the first and 0 (false) otherwise. The program should input a series of paris of integers.

```
#include<iostream>
using namespace std;
int mul(int,int);
int main()
{
        int a,b,r;
        cout<<"enter two integers"<<endl;
        cin>>a>>b;
      r= mul(a,b);
if (r==1)
cout<<b<<" is multiple of "<<a<<endl;
else
```

```
cout<<b<<" is not multiple of "<<a<<endl;
        return 0;
}
int mul(int a,int b){
if (b%a==0)
return 1;
else
return 0;
}
```

Problem 9.12

Write a program that inputs base and height of a triangle in main function and passes them to a function. The function finds the area of triangle and returns it to main function where it is displayed on the screen. Area=1/2(Base Height)

```
#include<iostream>
using namespace std;
float area(int,int);
int main()
{
        int h,b;
          float t;
        cout<<"enter two integers"<<endl;
        cin>>b>>h;
      t= area(b,h);
cout<<"area of triangle is "<<t<<endl;
        return 0;
}
float area(int b,int h){
```

```
float a;

a=0.5*b*h;

return a;

}
```

Problem 9.13

Write a progam that inputs two integers. It passes first integer to a function that calculates and returns its square. It passes second integer to another function that calculates and returns its cube. The main() functions adds both returned values and displays the sum on screen.

```
#include <iostream>

using namespace std;

int main(){

        int square(int);

        int cube (int);

        int x,y,r;

        cout<<"enter two integers"<<endl;

        cin>>x>>y;

        square(x);

        cube(y);

        r=square(x)+cube(y);

        cout<<"sum of square and cube of given integers is "<<r<<endl;

        return 0;


}

        int square(int x){

                return x*x;

        }

        int cube (int y){
```

```
        return y*y*y;
    }
```

Problem 9.13

Write a program that inputs two integers in main() function and passes the values to a function. The function finds and returns the greatest common divisor. The main() function then displays the returned value.

```
#include<iostream>
using namespace std;
int gcd (int,int);
int main()
{
   int x,y;
cout<<"enter two integers"<<endl;
cin>>x>>y;
gcd (x,y);
cout<<"greatest common divisor is "<<gcd(x,y)<<endl;
      return 0;
}
int gcd(int x,int y){
int g,n;
if (x<y)
n=x;
else
n=y;
for (int i=1; i<=n ; i++)
if (x%i==0 && y%i==0)
g=i;
```

```
return g;

}
```