CB.EN.U4CYS21014

DEEPTHI J

20CYS181 –Computer Programming Lab

Lab –1

TASK 1:

Write a program that will take 2 integer numbers as input from the user and it will print output after performing addition, subtraction, multiplication, division, and modulus operations. Print each output in a different line and give a tab between operation name and value calculated.

SYNTAX:

```
#include <stdio.h>
int main()
{
  //Declaring the variables
  int a, b, add, sub, mul, divi, mod;

  //Getting inputs from the user
  printf("Enter the value of a: ");
  scanf("%d",&a);
  printf("Enter the value of b: ");
  scanf("%d",&b);

  //Arithmetic operations
  add=a+b;
  sub=a-b;
  mul=a*b;
  divi=a/b;
  mod=a%b;

  //To display the output
  printf("Sum of '%d' and '%d':\t      %d\n",a,b,add);
  printf("Difference of '%d' and '%d':\t%d\n",a,b,sub);
  printf("Product of '%d' and '%d':\t%d\n",a,b,mul);
  printf("Division of '%d' and '%d':\t%d\n",a,b,divi);
  printf("Remainder of '%d' and '%d':\t%d\n",a,b,mod);
```

```
  return 0;
}
```

```c
#include <stdio.h>
int main()
{
  //Declaring the variables
  int a,b,add,sub,mul,divi,mod;
  //Getting inputs from the user
  printf("Enter the value of a: ");
  scanf("%d",&a);

  printf("Enter the value of b: ");
  scanf("%d",&b);
  //Arithmetic operations
  add=a+b;
  sub=a-b;
  mul=a*b;
  divi=a/b;
  mod=a%b;
  //To display the output
  printf("Sum of '%d' and '%d':\t       %d\n",a,b,add);
  printf("Difference of '%d' and '%d':\t%d\n",a,b,sub);
  printf("Product of '%d' and '%d':\t%d\n",a,b,mul);
  printf("Division of '%d' and '%d':\t%d\n",a,b,divi);
  printf("Remainder of '%d' and '%d':\t%d\n",a,b,mod);
  return 0;
}
```

OUTPUT:

Using the given test case: a=10, b=2

```
Enter the value of a: 10
Enter the value of b: 2
Sum of '10' and '2':           12
Difference of '10' and '2':     8
Product of '10' and '2':        20
Division of '10' and '2':       5
Remainder of '10' and '2':      0
```

TASK 2:

Repeat the above program with float numbers.

SYNTAX:

```
#include <stdio.h>
int main()
{
 //Declaring the variables
 float a,b,add,sub,mul,divi,mod;

 //Getting inputs from the user
 printf("Enter the value of a: ");
 scanf("%f",&a);
 printf("Enter the value of b: ");
 scanf("%f",&b);

 //Arithmetic operations
 add=a+b;
 sub=a-b;
 mul=a*b;
 divi=a/b;

 //To display the output
 printf("Sum of '%.2f' and '%.2f':\t      %.2f\n",a,b,add);
 printf("Difference of '%.2f' and '%.2f':\t%.2f\n",a,b,sub);
 printf("Product of '%.2f' and '%.2f':\t%.2f\n",a,b,mul);
 printf("Division of '%.2f' and '%.2f':\t%.2f\n",a,b,divi);

 return 0;
}
```

```c
#include <stdio.h>
int main()
{
  //Declaring the variables
  float a,b,add,sub,mul,divi,mod;
  //Getting inputs from the user
  printf("Enter the value of a: ");
  scanf("%f",&a);

  printf("Enter the value of b: ");
  scanf("%f",&b);
  //Arithmetic operations
  add=a+b;
  sub=a-b;
  mul=a*b;
  divi=a/b;

  //To display the output
  printf("Sum of '%.2f' and '%.2f':\t       %.2f\n",a,b,add);
  printf("Difference of '%.2f' and '%.2f':\t%.2f\n",a,b,sub);
  printf("Product of '%.2f' and '%.2f':\t%.2f\n",a,b,mul);
  printf("Division of '%.2f' and '%.2f':\t%.2f\n",a,b,divi);

  return 0;
}
```

OUTPUT:

```
Enter the value of a: 2
Enter the value of b: 3
Sum of 2.00 and '3.00':         5.00
Difference of '2.00' and '3.00':        -1.00
Product of '2.00' and '3.00':   6.00
Division of '2.00' and '3.00':  0.67
```

- Operations like addition, subtraction, multiplication, and division work using usual arithmetical operators as shown above.
- If we use the modulo operator (%) in a similar way for float values, it displays an error as shown below.

```c
mod=a%b;
```

```
main.c:25:8: error: invalid operands to binary % (have ‘float’ and ‘float’)
   25 |   mod=a%b;
      |       ^
```

So, to use the modulo operator for float type inputs, we have to use a different header like #include<math.h> and function like fmod() as shown below.

SYNTAX:

```
#include <stdio.h>
#include<math.h>
int main()
{
 //Declaring the variables
 float a,b,mod;

 //Getting inputs from the user
 printf("Enter the value of a: ");
 scanf("%f",&a);

 printf("Enter the value of b: ");
 scanf("%f",&b);

 //Arithmetic operation
 mod=fmod(a,b);

 //To display the output
 printf("Remainder of '%.2f' and '%.2f':\t%.2f\n",a,b,mod);


 return 0;
}
```

```c
#include <stdio.h>
#include<math.h>
int main()
{
  //Declaring the variables
  float a,b,mod;
  //Getting inputs from the user
  printf("Enter the value of a: ");
  scanf("%f",&a);

  printf("Enter the value of b: ");
  scanf("%f",&b);
  //Arithmetic operation
  mod=fmod(a,b);
  //To display the output
  printf("Remainder of '%.2f' and '%.2f':\t%.2f\n",a,b,mod);


  return 0;
}
```

OUTPUT:

```
Enter the value of a: 56.9
Enter the value of b: 23.4
Remainder of '56.90' and '23.40':       10.10
```

TASK 3:

Write a program to take principle, rate, and time from the user and print the simple interest as output.

SYNTAX:

```
#include <stdio.h>
int main()
{
 //Declaring the variables
 float amount,rate,SI;
 float year;

 //Getting inputs from the user
 printf("Enter the Principle amount: ₹");
 scanf("%f",&amount);

 printf("Enter the Rate of interest: ");
 scanf("%f",&rate);

 printf("Enter the no. of years: ");
 scanf("%f",&year);

 //Simple interest calculation
 SI = (amount * year * rate) / 100;

 //To print Simple interest calculated
 printf("Simple Interest for %.2f years = ₹%.2f\n",year, SI);
 printf("The amount after %.2f years = ₹%.2f",year, amount+SI);

 return 0;
}
```

```c
#include <stdio.h>

int main()
{
  //Declaring the variables
  float amount,rate,SI;
  float year;
  //Getting inputs from the user
  printf("Enter the Principle amount: ₹");
  scanf("%f",&amount);

  printf("Enter the Rate of interest: ");
  scanf("%f",&rate);

  printf("Enter the no. of years: ");
  scanf("%f",&year);
  //Simple interest calculation
  SI = (amount * year * rate) / 100;

  //To print Simple interest calculated
  printf("Simple Interest for %.2f years = ₹%.2f\n",year, SI);
  printf("The amount after %.2f years = ₹%.2f",year, amount+SI);
  return 0;
}
```

OUTPUT:

```
Enter the Principle amount: ₹20500
Enter the Rate of interest: 4.5
Enter the no. of years: 5
Simple Interest for 5.00 years = ₹4612.50
The amount after 5.00 years = ₹25112.50
```

TASK 4:

Take an integer from the user and print the square of it.

SYNTAX:

```
#include <stdio.h>

int main()
{
 //Declaring the variables
 int a,square;

 //Getting the input
 printf("Enter the number: ");
 scanf("%d",&a);

 //Equation to receive the square value
 square=a*a;

 //Printing the output
 printf("The square value of %d is: %d",a,square);
 return 0;
}
```

```c
#include <stdio.h>

int main()
{
  //Declaring the variables
  int a,square;

  //Getting the input
  printf("Enter the number: ");
  scanf("%d",&a);

  //Equation to receive the square value
  square=a*a;

  //Printing the output
  printf("The square value of %d is: %d",a,square);
  return 0;
}
```

OUTPUT:

```
Enter the number: 4
The square value of 4 is: 16
```

TASK 5:

Take one float number and one integer from the user and multiply and divide the integer with float. Write down your observation. Try it vice-versa also.

SYNTAX: (for dividing an integer by float)

```
#include <stdio.h>

int main()
{
  int a;
  float b,mul,divi;

  printf("Enter the value of a (integer value): ");
  scanf("%d",&a);
  printf("Enter the value of b (float value): ");
  scanf("%f",&b);

  mul=a*b;
  divi=a/b;

  printf("Product of %d and %.2f is: %.2f\n",a,b,mul);
  printf("Division of %d and %.2f is: %.2f",a,b,divi);

  return 0;
}
```

```c
#include <stdio.h>

int main()
{
  int a;
  float b,mul,divi;
  printf("Enter the value of a (integer value): ");
  scanf("%d",&a);
  printf("Enter the value of b (float value): ");
  scanf("%f",&b);
  mul=a*b;
  divi=a/b;
  printf("Product of %d and %.2f is: %.2f\n",a,b,mul);
  printf("Division of %d and %.2f is: %.2f",a,b,divi);

  return 0;
}
```

OUTPUT:

```
Enter the value of a (integer value): 3
Enter the value of b (float value): 6.8
Product of 3 and 6.80 is: 20.40
Division of 3 and 6.80 is: 0.44
```

Suppose, if try to get the remainder using this arithmetic assignment statement, we will get an error as shown below:

```c
mod=a%b;
```

```
main.c:21:8: error: invalid operands to binary % (have 'int' and 'float')
   21 |   mod=a%b;
```

Note: mod is declared as either int or float, we get the same error. This can be rectified using headers like #include<math.h> and fmod() function.

SYNTAX: (for diving float by an integer)

```
#include <stdio.h>

int main()
{
 int b;
 float a,mul,divi;

 printf("Enter the value of a (float value): ");
 scanf("%f",&a);
 printf("Enter the value of b (integer value): ");
 scanf("%d",&b);

 mul=a*b;
 divi=a/b;

 printf("Product of %.2f and %d is: %.2f\n",a,b,mul);
 printf("Division of %.2f and %d is: %.2f",a,b,divi);

 return 0;
}
```

```c
#include <stdio.h>

int main()
{
  int b;
  float a,mul,divi;
  printf("Enter the value of a (float value): ");
  scanf("%f",&a);
  printf("Enter the value of b (integer value): ");
  scanf("%d",&b);
  mul=a*b;
  divi=a/b;
  printf("Product of %.2f and %d is: %.2f\n",a,b,mul);
  printf("Division of %.2f and %d is: %.2f",a,b,divi);

  return 0;
}
```

OUTPUT:

```
Enter the value of a (float value): 78.876
Enter the value of b (integer value): 34
Product of 78.88 and 34 is: 2681.78
Division of 78.88 and 34 is: 2.32
```

Suppose, if try to get the remainder using this arithmetic assignment statement, we will get an error as shown below:

```
mod=a%b;
```

```
main.c:21:8: error: invalid operands to binary % (have ‘int’ and ‘float’)
   21 |    mod=a%b;
```

Note: mod is declared as either int or float, we get the same error. This can be rectified using headers like #include<math.h> and fmod() function as shown below.

```c
#include <stdio.h>
#include <math.h>

int main()
{
  int b;
  float a,mul,divi,mod;
  printf("Enter the value of a (float value): ");
  scanf("%f",&a);
  printf("Enter the value of b (integer value): ");
  scanf("%d",&b);
  mul=a*b;
  divi=a/b;
  mod=fmod(a,b);
  printf("Product of %.2f and %d is: %.2f\n",a,b,mul);
  printf("Division of %.2f and %d is: %.2f\n",a,b,divi);
   printf("Remainder of %.2f and %d is: %.2f\n",a,b,mod);


  return 0;
}
```

```
Enter the value of a (float value): 45.897
Enter the value of b (integer value): 3
Product of 45.90 and 3 is: 137.69
Division of 45.90 and 3 is: 15.30
Remainder of 45.90 and 3 is: 0.90
```