Lab 3

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1. Wap in C++ to find HCF of two numbers using functions with different types
   a) Call by value
   b) Call by address
   c) Call by reference

```
#include <iostream>
using namespace std;
int gcd (int a, int b)
{
  while(a != b)
  {
    if (a>b)
    { a = a-b;
    }
    else
    { b = b-a;
    }
  } return a;
int gcd1 ( int *a, int *b)
 { while (*a != *b)
 { if (*a > *b)
    { *a = *a - *b;
    } else
    { *b = *b - *a;
    }
  }
}
int gcd2 (int &a, int &b)
 { while( a != b)
  { if (a>b)
    { a = a-b;
    }
    else
  { b = b-a; } } }
```

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```
int main ()
{
    int x, y, hcf1, hcf2, hcf3;
    printf ("Enter two integers \n");
    scanf ("%d %d", &x, &y);
    hcf1 = gcd (x, y);
    printf ("Greatest common divisor of %d and %d using
     call by value is = %d \n", x, y, hcf1);

    int a, b;
    Printf ("Enter two integers \n");
    scanf ("%d %d", &a, &b);
    hcf2 = gcd1 (&a, &b);
    Printf (" Greatest common divisor of %d and %d using
          call by address is = %d \n", a, b, hcf2);

    int c, d;
    printf ("Enter two integers \n");
    scanf ("%d %d", &c, &d);
    hcf3 = gcd2 ( c, d);
    Printf (" Greatest common divisor of %d and %d using call by
          reference is = %d \n", c, d, hcf3);

    return 0;
}
```

Output:- Enter two integers - 4 9

Greatest common divisor of 4 and 9 using call by value is = 1

Enter two integers 20 45

Greatest common divisor of 20 and 45 using call by address is = 5

Enter two integers 25 30

Greatest common divisor of 25 and 30 using call by reference is = 5

2. WAP in C++ using function overloading to find product of two numbers of integers, float and double data types.

⇒
```
#include<iostream>
using namespace std;
int p(int a, int b)
{
  return a * b;
}
float p(float a, float b)
{
  return a * b;
}
double p(double a, double b)
{
  return a * b;
}
int main()
{
  int a, b;
  cout << "Enter two integers : " << endl;
  cin >> a >> b;
  cout << "product of integers are : " << p(a,b) << endl;
  float c, d;
  cout << "Enter two float values : " << endl;
  cin >> c >> d;
  cout << "product of float values are : " << p(c,d) << endl;
  double e, f;
  cout << "Enter two double values:" << endl;
  cin >> e >> f;
  cout << "product of integers are : " << p(e,f) << endl;
  return 0;
}
```

Output -
```
Enter two integers : 3 5
product of integers are : 15
Enter two float values : 2.3 4.6
product of float values = 10.58
Enter two double values : 12.44567 15.87654
product of integers are : 197.594
```

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Q3. Write in C++ using function overloading to find volumes of sphere, cylinder, and cube.

```
#include <iostream>
using namespace std;
int vol( int a)
{ return a * a * a;
}
float vol( float r)
  { return ( 4*3.14 * r*r * r)/3;
  }
float vol ( float r, int h)
  { return (3.14 * r * r * h)/3;
  }
int main()
{ int a;
  cout << " Enter the side of cube : " << endl;
  cin >> a;
  cout << " Volume of cube is " << vol (a) << endl;
  float c;
  cout << " Enter the radius of sphere : " << endl;
  cin >> c;
  cout << " Volume of sphere is : " << vol (c) << endl;
  float e;
  int h;
  cout << " Enter the radius and height of cylinder " << endl;
  cin >> e >> h;
  cout << " Volume of cylinder is : " << vol ( e, h) << endl;
  return 0;
}
```

Output - Enter the side of cube : 5
Volume of cube is = 125
Enter the radius of sphere : 5
Volume of sphere is : 523.333
Enter the radius and height of cylinder = 3 4
Volume of cylinder is : 37.68

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4. Wap in C++ using function to find the product of two number, three number and four numbers using default arguments.

```
# include <iostream>
using namespace std;
int product (int a=1, int b=1, int c=1, int d=1)
{ return a*b*c*d;
}
int main()
{ int a,b,c,d;
Cout << "Enter four integers:";
cin >> a >> b >> c >> d;
Cout << " product of 2 integers are : " << product (a,b) << endl;
Cout << " product of 3 integers is : " << product (a,b,c) << endl;
Cout << " product of 4 integers is : " << product (a,b,c,d) << endl;
return 0;
}
```

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