Ganpat University
॥ विद्यया समाजोत्कर्षः ॥

U.V. Patel College of Engineering

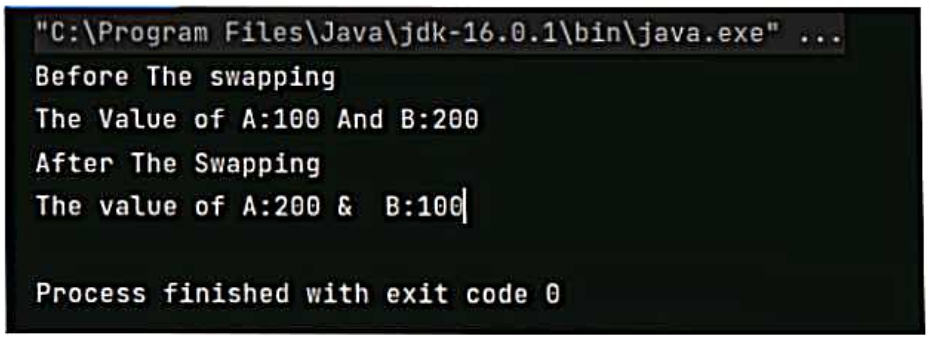
Department of Computer Engineering/Information Technology

Practical:

1. Swapping of Two number in Kotlin.

```
fun main(){
    var a=10
    var b=20
   var temp:Int
   println("Before Swapping:")
   println("The value of a is:$a and Value of B is:$b")
   temp=a
   a=b
   b=temp
   println("After swapping")
   println("The value of a is:$a and Value of B is:$b")
   change()
}
```

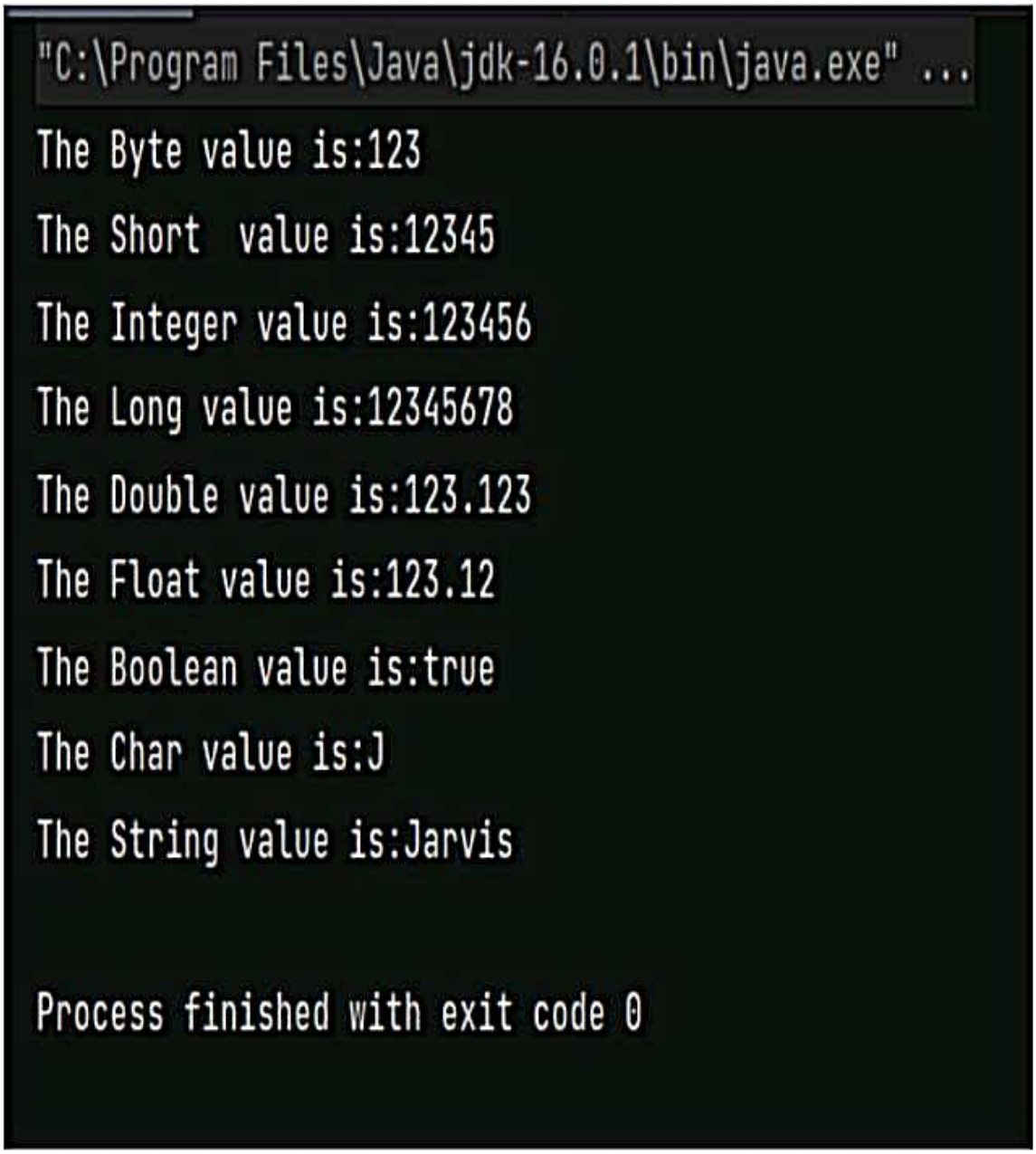
Output:



2. Store & Display values in different variable of different type (Int, Double, Float, Long, Short, Byte, Char, Boolean, String)

```
fun main()
{
var num: Byte =123
println("The Byte value is:$num")
var num1: Short= 12345
println("The Short  value is:$num1")
var num2: Int= 123456
println("The Integer value is:$num2")
var num3: Long= 12345678
println("The Long value is:$num3")
var num4: Double= 123.123
println("The Double value is:$num4")
var num5: Float= 123.12F
println("The Float value is:$num5")
var num6: Boolean= true
println("The Boolean value is:$num6")
var flatter: Char='J'
println("The Char value is:$flatter")
var name: String="Jarvis"
println("The String value is:$name")
}
```

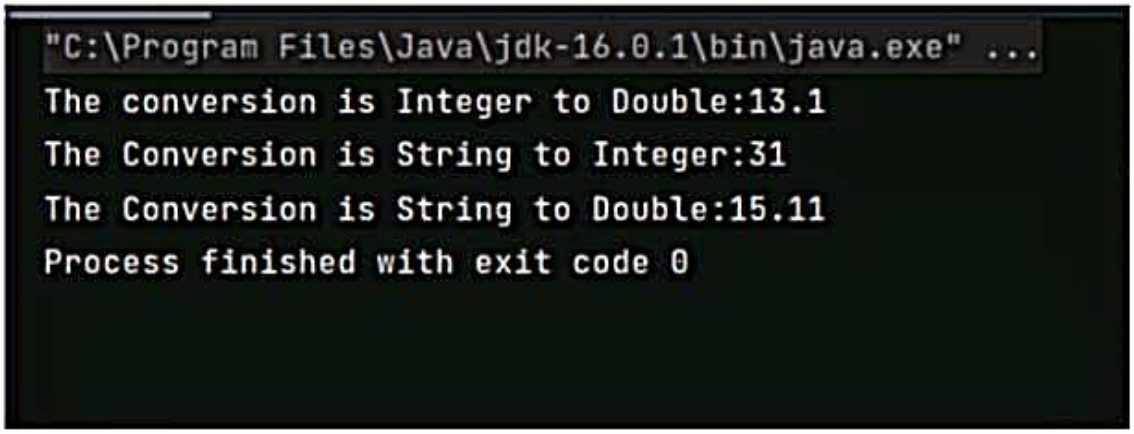
Output:


"C:\Program Files\Java\jdk-16.0.1\bin\java.exe" ...
The Byte value is:123
The Short value is:12345
The Integer value is:123456
The Long value is:12345678
The Double value is:123.123
The Float value is:123.12
The Boolean value is:true
The Char value is:J
The String value is:Jarvis
Process finished with exit code 0

3. Type conversion:
   Integer to Double, String to Integer, String to Double.

```
fun main()
{
   var num:Int=12
   var num1:Double=num.toDouble()

   print("The conversion is Integer to Double:")
   print(num1+1.1)

   var value:String="16"
   var value1:Int=value.toInt()
   println()
   print("The Conversion is String to Integer:")


   print(+value1+15)
   var element:String="15.00"
   var element1:Double=element.toDouble()
   println()

   print("The Conversion is String to Double:")
   print(element1+0.11)
}
```

Output:



4. Swapping of Two number by with third Variable & without third variable

```
fun main()
{
   var a=10
   var b=5
   var a2:Int

   println("Using Three variable")
   println("\nBefore Swap")
   println("The value of A:$a & B:$b")

   a2=a
   a=b
   b=a2

   println("After Swap")
   println("The value of A:$a & B:$b")

   var c=10
   var d=5
```

```
    println("\nUsing Two variable")
    println("\nBefore Swap")
    println("The value of C:$c & D:$d")

    c=c+d
    d=c-d
    c=c-d

    println("After Swap")
    println("The value of C:$c & D:$d")
}
```

Output:

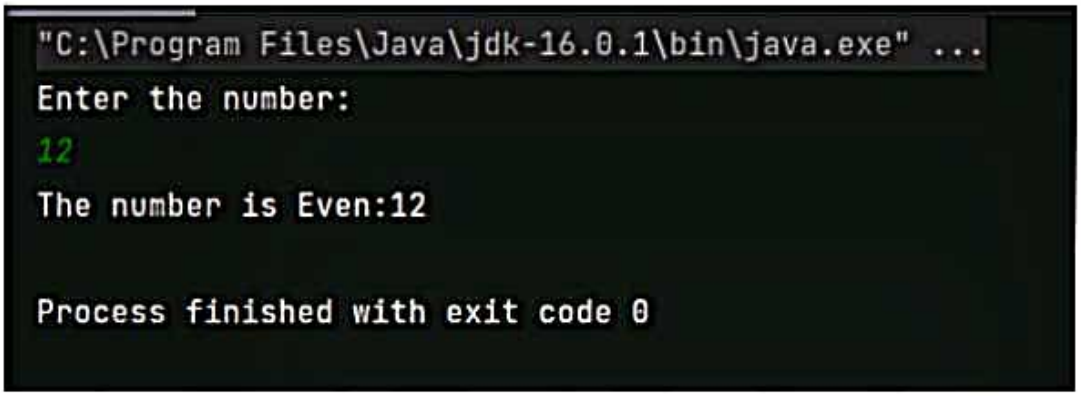
```
"C:\Program Files\Java\jdk-16.0.1\bin\java.exe" ...
Using Three variable

Before Swap
The value of A:10 & B:5
After Swap
The value of A:5 & B:10

Using Two variable

Before Swap
The value of C:10 & D:5
After Swap
The value of C:5 & D:10

Process finished with exit code 0
```

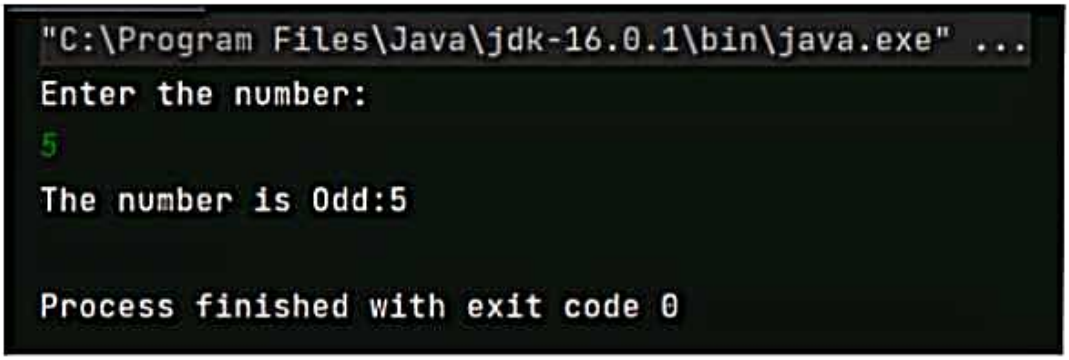
5. Find the number is odd or even by using Control Flow

```
fun main() {

    val read=   Scanner(System.`in`)

    println("Enter the number:");
    val a=read.nextInt();

    if(a%2==0)
    {
       println("The number is Even:$a")
    }
    else
    {
       println("The number is Odd:$a")
```

```
    }
}
```

Output:



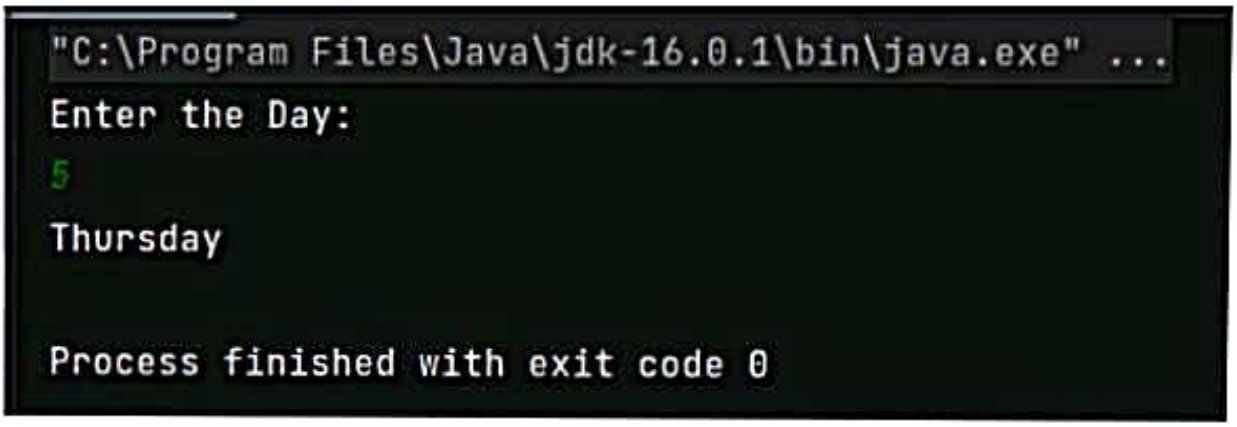


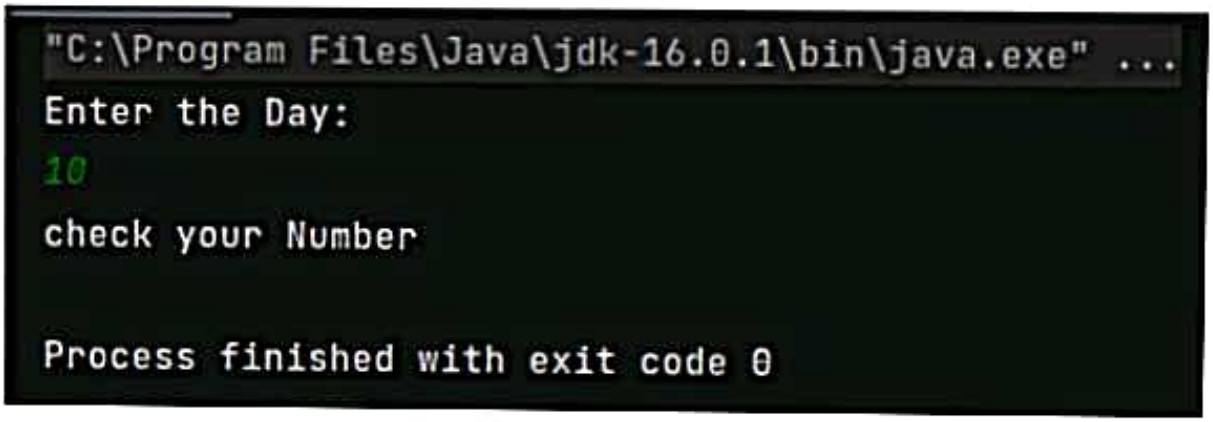
6. Display month name using When

```
import java.util.*
import kotlin.math.ln

fun main() {

    var day=Scanner(System.`in`)

    println("Enter the Day:")
    var name=day.nextInt()
```

```
when(name)
{
    1 -> println("Sunday")
    2 -> println("Monday")
    3 -> println("Tuesday")
    4 -> println("Wednesday")
    5 -> println("Thursday")
    6 -> println("Friday")
    7 -> println("Saturday")
    else ->
    {
        println("check your Number")
    }
}

}
```

Output:


"C:\Program Files\Java\jdk-16.0.1\bin\java.exe" ...
Enter the Day:
5
Thursday
Process finished with exit code 0


"C:\Program Files\Java\jdk-16.0.1\bin\java.exe" ...
Enter the Day:
10
check your Number
Process finished with exit code 0

```
import java.util.*
fun main()
{
    var read=Scanner(System.`in`)

    println("Enter Number1:");
    var numb1:Double=read.nextDouble()

    println("Enter Number2:")
    var numb2:Double=read.nextDouble()

    var a:Double
    a=sum(numb1, numb2)
    println("The Addition of $numb1 & $numb2 is:$a")

    var b:Double
    b=sub(numb1,numb2)
 println("The Subtraction of $numb1 & $numb2 is:$b")

    var c:Double
    c=mul(numb1,numb2)
println("The Multiplication of $numb1 & $numb2 is:$c")

    var d:Double
    d=div(numb1,numb2)
    println("The Division of $numb1 & $numb2 is:$d")

    var e:Double
    e=mud(numb1,numb2)
    println("The Modulus of $numb1 & $numb2 is:$e")
```

```
fun sum(num1: Double, num2:Double):Double {
    var sum:Double=(num1+num2)
    return sum
}

fun sub(num1: Double,num2: Double):Double
{
    var sub:Double=(num1-num2)
    return sub
}
fun mul(num1: Double,num2: Double):Double{
    var mul:Double=(num1*num2)
    return mul
}
fun div(num1: Double,num2: Double):Double{
    var div:Double=(num1/num2)
    return div
}
fun mud(num1: Double,num2: Double):Double{
    var mud:Double=(num1%num2)
    return mud
     }
```

Output:

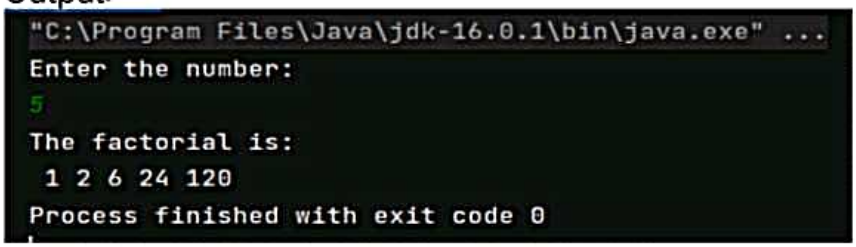
```
"C:\Program Files\Java\jdk-16.0.1\bin\java.exe" ...
Enter Number1:
10
Enter Number2:
5
The Addition of 10.0 & 5.0 is:15.0
The Subtraction of 10.0 & 5.0 is:5.0
The Multiplication of 10.0 & 5.0 is:50.0
The Division of 10.0 & 5.0 is:2.0
The Modulus of 10.0 & 5.0 is:0.0

Process finished with exit code 0
```

8. Find the factorial of number by using "tailrec" keyword

```
import java.util.*

fun main()
{
   var read=Scanner(System.`in`)

   println("Enter the number:")
   var num=read.nextInt()
   println("The factorial is:")
  for (i in 1..num) {
      var r: Long = fact(i)
      print(" "+r)

   }

}
tailrec fun fact(numb:Int,run:Int=1): Long {

   if(numb>=1)
```

```
    {
        return fact(numb-1,run*numb)
    }
    else
    {
        return run.toLong()
    }
}
```

Output:



9. Sort Array of Integer data type without using inbuilt function & with using inbuilt function.

```
import java.security.spec.MGF1ParameterSpec
import java.util.*
import javax.swing.SortOrder

fun main() {

    var read=Scanner(System.`in`)
    println("Enter the size of Array:")
    var arrayint=IntArray(read.nextInt())
    println("Enter the Element")
    for (i in 0..arrayint.size-1)
    {
        arrayint[i]=readLine()!!.toInt()
```

```
    }

    withOutfun(num1 = *arrayint)
    println()
    withusingfun(num1 = *arrayint)
}

fun withOutfun(vararg num1:Int)
{
    println("Without function")
    print("Before Sorting Element")
    println()
    for (i in 0..num1.size-1)
    {
        print(" "+num1[i])
    }

    var temp:Int

    for (i in 0..num1.size-1)
    {
        for (j in 1..num1.size-1)
        {
            if(num1[j-1]>num1[j])//5 4 3 2 1
            {
                temp=num1[j-1]
                num1[j-1]=num1[j]
                num1[j]=temp
            }
        }
    }
```

```
    println()
    println("After Sorting")
    for (i in 0..num1.size-1)
    {
        print(" "+num1[i])
    }
}
fun withusingfun(vararg num1: Int){


    println("The using sort function")

    num1.sort()
    for (i in 0..num1.size-1)
    {
        print(" "+num1[i])
    }

}
```

Output:

```
"C:\Program Files\Java\jdk-16.0.1\bin\java.exe" ...
Enter the size of Array:
5
Enter the Element
6
5
4
2
3
Without function
Before Sorting Element
 6 5 4 2 3
After Sorting
 2 3 4 5 6
The using sort function
 2 3 4 5 6
```

10. Find the max number from ArrayList.

```
fun main() {

    var max=maxnum()
    println()
    println("The maximum Number is: "+max)

}
fun maxnum(): Int {
    var list=ArrayList<Int>()
    list.add(10)
    list.add(20)
    list.add(30)
    list.add(50)
    list.add(70)
    list.add(5)
    list.add(80)
    for(a in list)
    {
        print(" "+a)
    }

    var largest=list[0]
    for (num in list)
    {
        if(largest < num)
            largest=num
    }
    return largest;
}
```

```
"C:\Program Files\Java\jdk-16.0.1\bin\java.exe" ...
 10 20 30 50 70 5 80
The maximum Number is: 80
```

11. Perform Two 3 X 3 Matrix Addition & Subtraction (2D Array)

```
import com.matrix.printmatrix
import java.util.*

fun main() {

   var row=3
   var column=3

   var firstmatrix= arrayOf(intArrayOf(1,2,3), intArrayOf(4,5,6),
intArrayOf(7,8,9))
   var secondmatrix= arrayOf(intArrayOf(1,2,3),intArrayOf(4,5,6),
intArrayOf(7,8,9))

   var sum=Array(row){IntArray(column)}
   var sub=Array(row){IntArray(column)}
   print("The 1st array of sum is:")
   println()
   for(f in 0 until row)
   {
      for (k in 0 until column)
      {

         print( " "+firstmatrix[f][k]+" " )
      }
      println()
```

```
    }
    print("The 2sd array of sum is:")
    println()
    for(s in 0 until row)
    {
        for (r in 0 until column)
        {

            print( " "+secondmatrix[s][r]+" " )
        }
        println()
    }
    for (i in 0..row - 1)
    {
        for (j in 0..column -1)
        {
            sum[i][j]=firstmatrix[i][j]+secondmatrix[i][j]
        }
    }
    println("the Sum of 2d array")
    for (row in sum)
    {
        for (column in row)
        {
            print(" $column ")
        }
        println()
    }
    var fmatrix= arrayOf(intArrayOf(10,22,35), intArrayOf(14,25,66)
intArrayOf(27,18,39) )
    var smatrix= arrayOf(intArrayOf(1,2,3),intArrayOf(4,5,6),
```

```
intArrayOf(7,8,9))
    print("The 1st array of subtraction is:")
    println()
    for(f in 0 until row)
    {
        for (k in 0 until column)
        {

            print( " "+fmatrix[f][k]+" " )
        }
        println()
    }
    print("The 2sd array of subtraction is:")
    println()
    for(s in 0 until row)
    {
        for (r in 0 until column)
        {

            print( " "+smatrix[s][r]+" " )
        }
        println()
    }
    println("the sub of 2d array")
    for (i in 0..row - 1)
    {
        for (j in 0..column -1)
        {
            sub[i][j]=fmatrix[i][j]-smatrix[i][j]
        }
    }
```

```
    for (row in sub)
    {
        for (column in row)
        {
            print(" $column ")
        }
        println()
    }
}
```

```
"C:\Program Files\Java\jdk-16.0.1\bin\java.exe" ...
The 1st array of sum is:
 1  2  3
 4  5  6
 7  8  9
The 2sd array of sum is:
 1  2  3
 4  5  6
 7  8  9
the Sum of 2d array
 2  4  6
 8  10  12
 14  16  18
The 1st array of subtraction is:
 10  22  35
 14  25  66
 27  18  39
The 2sd array of subtraction is:
 1  2  3
 4  5  6
 7  8  9
the sub of 2d array
 9  20  32
 10  20  60
 20  10  30
```

of all object.

```
package com.MAD6.car

class car(var type:String,var model:Int,var Colour:String,var price:
Int,var Owner:String) {

    fun getcarPrice(): Double {
        var totalprice:Double=price-(model.toDouble())
        return totalprice;
    }
}

fun main() {
    var listofobj= arrayListOf<car>()
    listofobj.add(car("Mustang",2020,"Red",75000,"Jarvis"));
    listofobj.add(car("Camaro",2016,"Yellow",60000,"Lucifer"));
    listofobj.add(car("Scorpio",2011,"White",55000,"Tonny"));
    for (i in listofobj)
    {
        println("-----------------");
        println("Type:"+i.type)
        println("Mode:"+i.model)
        println("Colour:"+i.Colour)
        println("Price:"+i.price)
        println("Owner:"+i.Owner)
        println("Average Price of year 2021:"+i.getcarPrice())
    }
}
```

Output:

```
"C:\Program Files\Java\jdk-16.0.1\bin\java.exe" ...
------------------
Type:Mustang
Mode:2020
Colour:Red
Price:75000
Owner:Jarvis
Average Price of year 2021:72980.0
------------------
Type:Camaro
Mode:2016
Colour:Yellow
Price:60000
Owner:Lucifer
Average Price of year 2021:57984.0
------------------
Type:Scorpio
Mode:2011
Colour:White
Price:55000
Owner:Tonny
Average Price of year 2021:52989.0
```

```
package com.MAD6.person

import com.MAD6.car.car

open class person(){
    open var name:String?=null
    var age:Int?=null
    var city:String?=null
    var number:Long?=null
    var bloodgroup:String?=null
    constructor(name:
String,age:Int,city:String,number:Long,bloodgroup:String):this(){
        this.name=name
        this.age=age
        this.city=city
        this.number=number
        this.bloodgroup=bloodgroup
    }

}
class student: person{
    open var enrollmentno:Int?=null
    var sem:String?=null
    var collegename:String?=null
    var branch:String?=null
    constructor(name:String,age:Int,city: String,number:
Long,bloodgroup:
String,enrollmentno:Int,sem:String,collegename:String,branch:Strin
g):super(name,age,city,number,bloodgroup){
```

```
        this.sem=sem
        this.collegename=collegename
        this.branch=branch
    }

}
fun main() {
  // var
s1=student("salman",22,"jnd",1234,"b+",21,"5th","UVPCE","CE");
    var listofstd= arrayListOf<student>()

        listofstd.add(student("Salman", 22, "JND", 9875542586, "B+"
21, "5th", "UVPCE", "CE"));
        listofstd.add(student("Arman", 18, "VD", 997548622, "A+", 10,
"1th", "LPU", "B.COM"));
        listofstd.add(student("Adnan", 20, "AMD", 695874632, "A+",
20, "3th", "NU", "BBA"));
        listofstd.add(student("Fesal", 23, "RJK", 8501244444, "B-",
1,"5th", "AT","ME"));
        listofstd.add(student("Sahil", 24, "JND", 7854861235, "A-", 33
"3th", "NP", "PH"));
        for(i in listofstd)
        {
            println("------------");
            println("Name:"+i.name);
            println("Age:"+i.age);
            println("City:"+i.city);
            println("Contact-NO:"+i.number);
            println("Blood-Group:"+i.bloodgroup);
            println("Enrollment-NO:"+i.enrollmentno);
            println("Semester:"+i.sem);
```

```
        println("College-Name:"+i.collegename);
        println("Branch-Name:"+i.branch);

    }

}
```

Output:

```
"C:\Program Files\Java\jdk-16.0.1\bin\java.exe" ...
------------
Name:Salman
Age:22
City:JND
Contact-NO:9875542586
Blood-Group:B+
Enrollment-NO:21
Semester:5th
College-Name:UVPCE
Branch-Name:CE
------------
Name:Arman
Age:18
City:VD
Contact-NO:997548622
Blood-Group:A+
Enrollment-NO:10
Semester:1th
College-Name:LPU
Branch-Name:B.COM
------------
```

```
------------
Name:Adnan
Age:20
City:AMD
Contact-NO:695874632
Blood-Group:A+
Enrollment-NO:20
Semester:3th
College-Name:NU
Branch-Name:BBA
------------
Name:Fesal
Age:23
City:RJK
Contact-NO:8501244444
Blood-Group:B-
Enrollment-NO:1
Semester:5th
College-Name:AT
Branch-Name:ME
------------
Name:Sahil
Age:24
City:JND
Contact-NO:7854861235
Blood-Group:A-
Enrollment-NO:33
Semester:3th
College-Name:NP
Branch-Name:PH
```

14. Create Class of 3 X 3 Matrix and Perform various operation on matrix like addition, subtraction, multiplication by using operator overriding.

```
package com.matrix

class matrix {
    private var mat = arrayOf(IntArray(3), IntArray(3), IntArray(3))

    constructor(mat: Array<IntArray>) {
        this.mat = mat
    }

    fun getmatrix(): Array<IntArray> {
        return mat
    }

    operator fun plus(ob1: matrix): Array<IntArray> {
        var add: Array<IntArray> = arrayOf(IntArray(ob1.mat.size),
IntArray(ob1.mat.size), IntArray(ob1.mat.size))

        for (i in 0 until 3) {
            for (j in 0 until 3) {
                add[i][j] = ob1.mat[i][j] + this.mat[i][j]
            }
        }


        return add
    }

     operator fun minus(ob1: matrix):Array<IntArray> {
        var subt: Array<IntArray> = arrayOf(IntArray(ob1.mat.size),
```

```
IntArray(ob1.mat.size),IntArray(ob1.mat.size))
        for (i in 0 until 3)
        {
            for (j in 0 until 3)
            {
                subt[i][j]= ob1.mat[i][j] - this.mat[i][j]
            }
        }
        return subt
    }
    operator fun times(ob1:matrix):Array<IntArray>{
        var mul: Array<IntArray> = arrayOf(IntArray(ob1.mat.size),
IntArray(ob1.mat.size),IntArray(ob1.mat.size))
        for (i in 0 until 3)
        {
            for (j in 0 until 3)
            {
                mul[i][j]=ob1.mat[i][j] * this.mat[i][j]
            }
        }
        return mul
    }
}
fun printmatrix(mat:Array<IntArray>){
    for(i in 0 until 3){
        for (j in 0 until 3){
            print("${mat[i][j]} ")

        }
        println()
    }
```

```
    println()
}

fun main() {
    var mat1 : Array<IntArray> = arrayOf(intArrayOf(2,3,4),
intArrayOf(1,90,3), intArrayOf(54,12,34))
    var mat2 : Array<IntArray> = arrayOf(intArrayOf(26,30,14),
intArrayOf(11,90,43), intArrayOf(5,2,55))

    var matAdd: Array<IntArray>
    var matSub: Array<IntArray>
    var matMulti: Array<IntArray>

    var Matrix1: matrix = matrix(mat1)
    var Matrix2: matrix = matrix(mat2)

    matAdd = Matrix1 + Matrix2
    matSub = Matrix1 - Matrix2
    matMulti = Matrix1 * Matrix2

    println("Matrix-1")
    printmatrix(Matrix1.getmatrix())

    println("Matrix-2")
    printmatrix(Matrix2.getmatrix())

    println("Addition Matrix:")
    printmatrix(matAdd)

    println("Subtraction Matrix:")
    printmatrix(matSub)
```

```
    println("Multiplication Matrix:")
    printmatrix(matMulti)

}
```

Output:

```
"C:\Program Files\Java\jdk-16.0.1\bin\java.exe" ...
Matrix-1
2 3 4
1 90 3
54 12 34

Matrix-2
26 30 14
11 90 43
5 2 55

Addition Matrix:
28 33 18
12 180 46
59 14 89

Subtraction Matrix:
24 27 10
10 0 40
-49 -10 21

Multiplication Matrix:
52 90 56
11 8100 129
270 24 1870
```