[2CEIT5PE5: MOBILE APPLICATION DEVELOPMENT]

Practical: 1

AIM- Kotlin Programs

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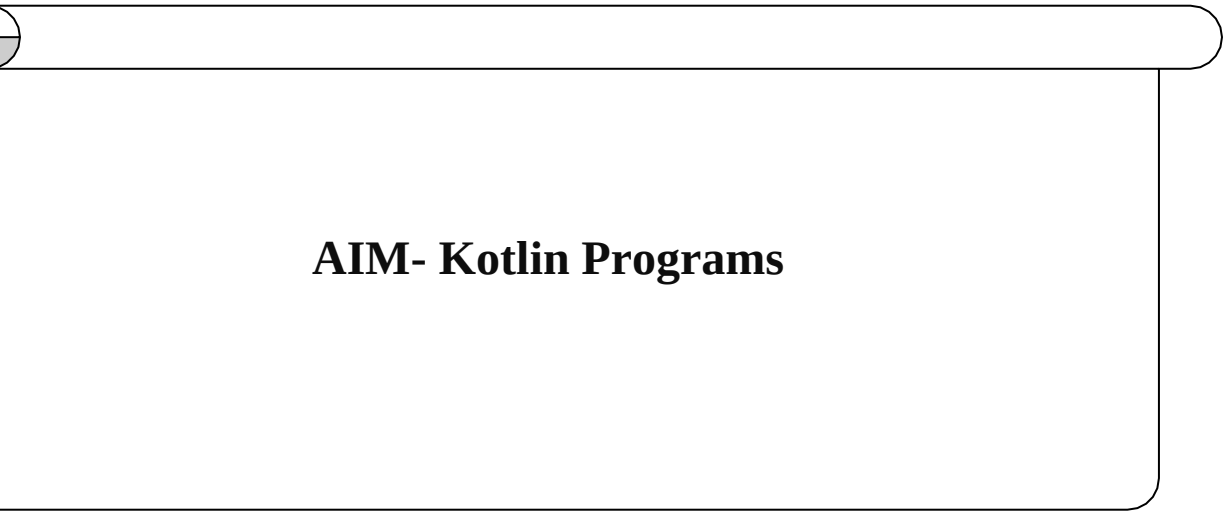


Department of Information Technology

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

Answer:

```
fun main()
{
    val a : Int=20
    println("Integer Value :" +a)
    val b : Float=1.5f
    println("Float Value :" +b)
    val c : Char='k'
    println("Character Value :" +c)
    val d : String="Krish"
    println("String Value :" +d)
    val e : Boolean= false
    println("Boolean Value :" +e)
    val f : Double=20.15
    println("Double Value :" +f)
    val g : Long=2020202020
    println("Long Value :" +g)
    val h : Short=-5
    println("Short Value :" +h)
    val i : Byte=127
    println("Byte Value :" +i)
}
```

Output:

```
Integer Value :20
Float Value :1.5
Character Value :k
String Value :Krish
Boolean Value :false
Double Value :20.15
Long Value :2020202020
Short Value :-5
Byte Value :127
```

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

Answer:

```
fun main(){
    var int_val : Int = 10
    var new_value : Double = int_val.toDouble()
    println("Integerr Value: $int_val \nDouble From Integer:
$new_value")

    var string : String = "10"
    var new_string : Int = string.toInt()
    var dou_string : Double = string.toDouble()
    var new = dou_string+1.12
    println("String Value: $string \nInteger Value1: $new_string
\nInteger Value2: $new_string")
    println("Double Value: $new")
}
```

Output:

```
Integerr Value: 10
Double From Integer: 10.0
String Value: 10
Integer Value1: 10
Integer Value2: 10
Double Value: 11.120000000000001
```

3. Scan student's information and display all the data.

Answer:

```
fun main()
{
    var a="Student Name : "
    print("$a")
    var b=readLine()
    var c="Age : "
    print("$c")
    var d=readLine()
    var e="Student Enrollment Number : "
    print("$e")
```

```
    var f=readLine()
    var g="Branch : "
    print("$g")
    var h=readLine()
    var i="Student Class : "
    print("$i")
    var j=readLine()
    var k="Student College Name : "
    print("$k")
    var l=readLine()
    var m="Student University Name : "
    print("$m")
    var n=readLine()
    println()
    println()
    println("****************************")
    println()
    println()
    println("Students Data : ")
    println()
    print("Name : ")
    println("$b")
    print("Age : ")
    println("$d")
    print("Enrollment No. : ")
    println("$f")
    print("Branch : ")
    println("$h")
    print("Class : ")
    println("$j")
    print("College Name : ")
    println("$l")
    print("University Name : ")
    println("$n")
}
```

Output:

```
Student Name : Krish
Age : 19
Student Enrollment Number : 21012021050
Branch : 5A-3
Student Class : CEIT-A
Student College Name : U.V.P.C.E
Student University Name : Ganpat University

**********************************************************************
```

```
 Students Data :

 Name : Krish
 Age : 19
 Enrollment No. : 21012021050
 Branch : 5A-3
 Class : CEIT-A
 College Name : U.V.P.C.E
 University Name : Ganpat University
```

4. Find the number is odd or even by using Control Flow inside println() method.

Answer:

```
fun main() {
    print("enter number: ")
    var num = readLine()!!.toInt()
    if(num%2==0)
    {
        println("Even!")
    }
    else
    {
        println("Odd!")
    }
}
```

Output:

```
cd /home/cg/root/64d3cdb08c56e
Enter a number : 15
15 is odd
```

```
cd /home/cg/root/64d3cdb08c56e
Enter a number : 30
30 is even
```

5. Display month name using When

Answer:

```
fun main() {
    print("Enter Month Number: ")
    var num = readLine()
    when(num)
    {
        "1" -> println("January")
        "2" -> println("February")
        "3" -> println("March")
        "4" -> println("April")
        "5" -> println("May")
        "6" -> println("June")
        "7" -> println("July")
        "8" -> println("August")
        "9" -> println("September")
        "10" -> println("October")
        "11" -> println("November")
        "12" -> println("December")
        else -> println("Enter Valid Number!")
    }}
```

Output:

```
cd /home/cg/root/64d3cdb08c56e
Enter Month Number :
7
July
```

6. By using a user defined function perform all arithmetic operations

Answer:

```
fun main() {
    var a= 111
    var b= 2222
    var c= -222
    var ans = a+b+c
    var ans1 = a-b-c
    var ans2 = a*b*c
    var ans3 = b/a
    println("Addition of $a $b $c is $ans")
    println("Subtraction of $a $b $c is $ans1")
    println("Multiplication of $a $b $c is $ans2")
    println("Division of $b $a is $ans3")
}
```

Output:

```
cd /home/cg/root/64d3cdb08c56e

Addition of 111 2222 -222 is 2111
Subtraction of 111 2222 -222 is -1889
Multiplication of 111 2222 -222 is -54754524
Division of 2222 111 is 20
```

7. **Find the factorial of number by recursion. Explain "tailrec" keyword.**

Answer:

```
fun main() {
    print("Enter Number: ")
    var number = readLine()!!.toInt()
    val factorial = fact(number)
    println("Factorial of $number = $factorial")
}

tailrec fun fact(n: Int, temp: Int = 1): Int {
    return if (n == 1){
        temp
    } else {
        fact(n-1, temp*n)
    }
}
```

Output:

```
cd /home/cg/root/64d3cdb08c56e
Enter Number: 15
Factorial of 15 = 2004310016
```

8. Create different types of Array as shown in image. Explore Arrays.deepToString(), contentDeepToString() methods, IntArray variable .joinToString() and use in program to print Array. Explore range, downTo, until etc. for loop and use in this program. Sort Array of Integer data type without using inbuilt function & with using inbuilt function

Answer:

```
import java.util.*
fun sortarray(arr:IntArray,n:Int):IntArray
{
    for (i in 0 until n - 1) {
        for (j in 0 until n - i - 1) {
            if (arr[j] > arr[j + 1]) {
                // Swap the elements
                val temp = arr[j]
                arr[j] = arr[j + 1]
                arr[j + 1] = temp
            }
        }
    }
    return arr
}
val arr = { size:Int-> Array<Int>(size){index->index}}
fun main()
{
    var a= arrayOf<Int>(10,90,60,80,100)
    println(Arrays.deepToString(a))
    var a1=Array<Int>(5){0}
    println(Arrays.deepToString(a1))
    val a2=arr(5)
    println(Arrays.deepToString(a2))
    var a3=IntArray(5){0}
    println(a3.joinToString())
    var a4= intArrayOf(1,2,3,4,5)
    println(a4.joinToString())
    var a5= arrayOf(intArrayOf(1,3), intArrayOf(4,5), intArrayOf(6,7))
    println(a5.contentDeepToString())
    var a6=IntArray(5)
```

```
    for(i in a6.indices)
    {
        print("a[$i]=")
        a6[i]=readLine()!!.toInt()
    }
    println("Elements you have Entered.")
    println(a6.contentToString())
    a6.sort()
    println("After sorting in Built-in function.")
    println(a6.contentToString())
    println("After sorting without using Built-in function.")
    var a7=sortarray(a6,5)
    println(a7.contentToString())
}
```

Output:

```
"C:\Program Files\Java\jdk-20\bin\java.exe" "-javaagent:
[10, 90, 60, 80, 100]
[0, 0, 0, 0, 0]
[0, 1, 2, 3, 4]
0, 0, 0, 0, 0
1, 2, 3, 4, 5
[[1, 3], [4, 5], [6, 7]]
a[0]=45
a[1]=2
a[2]=4
a[3]=99
a[4]=3
Elements you have Entered.
[45, 2, 4, 99, 3]
After sorting in Built-in function.
[2, 3, 4, 45, 99]
After sorting without using Built-in function.
[2, 3, 4, 45, 99]

Process finished with exit code 0
```

9. Find the max number from ArrayList

Answer:

```
fun main() {
    var array = Array<Int>(5){0}
    var x:Int = 0
    val abc:Int = array.size
    while( x < abc)
    {
        print("a[$x]=")
        array[x] = readLine()!!.toInt()
        x++
    }
    var largest = array[0]
    for (num in array) {
        if (largest < num)
            largest = num
    }
    println("Largest element = $largest")
}
```

Output:

```
"C:\Program Files\Java\jdk-20\bin\java.exe"
a[0]=78
a[1]=12
a[2]=55
a[3]=3
a[4]=1
Largest element = 78

Process finished with exit code 0
```

10. Write Different types of Class & Constructor. Create a class Car and set various members like type, model, price, owner. add the function getCarPrice in it. Create an object of Car class and access property of it. (getCarInformation(), getOriginalCarPrice(), getCurrentCarPrice(), displayCarInfo() etc.)

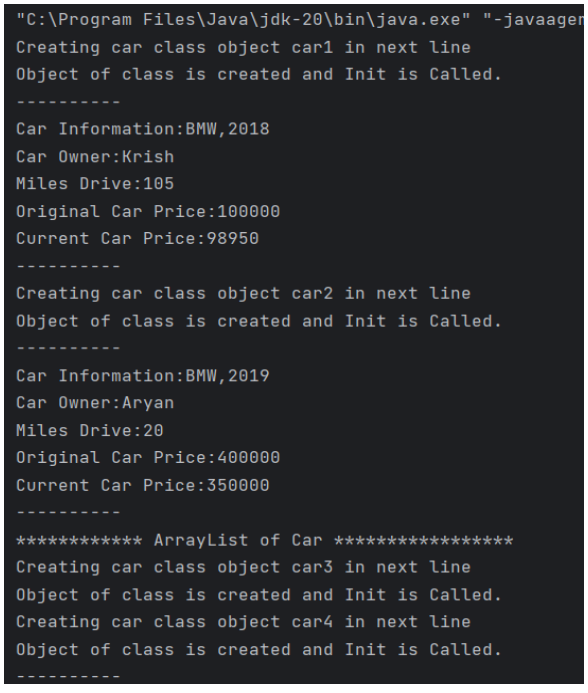
Answer:

```
class car(var carobjn:Int,var type:String,var model:String,var
originalprice:Long,var currentprice:Long,var owner:String,var
milesdrive:Long){
    init {
        println("Creating car class object car$carobjn in next
```

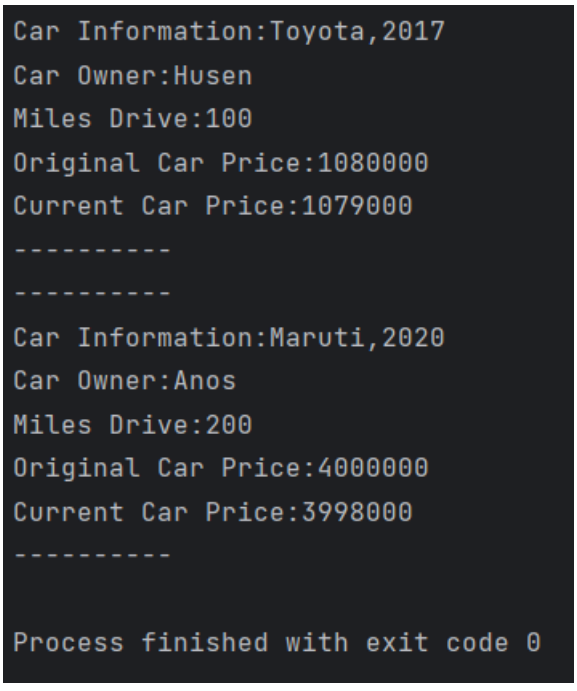
```
line")
        println("Object of class is created and Init is Called.")
    }
    fun getcarprice():Long{
        return originalprice
    }
    fun getcarinformation():Array<String>
    {
        var a1= arrayOf<String>(type,model,owner)
        return a1
    }
    fun getoriginalprice():Long
    {
        return originalprice
    }
    fun getcurrentprice():Long
    {
        return currentprice
    }
    fun displaycarinfo(){
        println("----------")
        var a=getcarinformation()
        println("Car Information:${a[0]},${a[1]}")
        println("Car Owner:${a[2]}")
        println("Miles Drive:$milesdrive")
        println("Original Car Price:$originalprice")
        println("Current Car Price:$currentprice")
        println("----------")
    }
}

fun main()
{
    var no:Int=0;
    no=no+1
    var obj1=car(no,"BMW","2018",100000,98950,"ansh",105)
```

```
    obj1.displaycarinfo()
    no=no+1
    var obj2=car(no,"BMW","2019",400000,350000,"Raj",20)
    obj2.displaycarinfo()

    println("************ ArrayList of Car *****************")
    no=no+1
    var
obj3=car(no,"Toyota","2017",1080000,1079000,"Mahavir",100)
    no=no+1
    var obj4=car(no,"Maruti","2020",4000000,3998000,"Nisarg",200)

    var person=arrayOf<car>(obj3,obj4)
    for(i in person)
    {
       i.displaycarinfo()}}
```

Output:



```
"C:\Program Files\Java\jdk-20\bin\java.exe" "-javaager
Creating car class object car1 in next line
Object of class is created and Init is Called.
----------
Car Information:BMW,2018
Car Owner:Krish
Miles Drive:105
Original Car Price:100000
Current Car Price:98950
----------
Creating car class object car2 in next line
Object of class is created and Init is Called.
----------
Car Information:BMW,2019
Car Owner:Aryan
Miles Drive:20
Original Car Price:400000
Current Car Price:350000
----------
************ ArrayList of Car *****************
Creating car class object car3 in next line
Object of class is created and Init is Called.
Creating car class object car4 in next line
Object of class is created and Init is Called.
----------
```



```
Car Information:Toyota,2017
Car Owner:Husen
Miles Drive:100
Original Car Price:1080000
Current Car Price:1079000
----------
----------
Car Information:Maruti,2020
Car Owner:Anos
Miles Drive:200
Original Car Price:4000000
Current Car Price:3998000
----------

Process finished with exit code 0
```

11. Write about Operator Overloading. Perform Matrix Addition, Subtraction & Multiplication using Class & operator overloading. Overload toString() function in Matrix class.

Answer:

```
import kotlin.math.min
class Matrix(var data:Array<IntArray>, var rows:Int, var
cols:Int)
{
    operator fun plus(other: Matrix): Array<IntArray> {
        val resultData = Array(rows) {IntArray(cols) }
        for (i in 0 until rows) {
            for (j in 0 until cols) {
                resultData[i][j] = this.data[i][j] +
other.data[i][j]
            }
        }
        return resultData
    }
    operator fun minus(other: Matrix): Array<IntArray> {
        val resultData = Array(rows) {IntArray(cols) }
        for (i in 0 until rows) {
            for (j in 0 until cols) {
                resultData[i][j] = this.data[i][j] -
other.data[i][j]
            }
        }
        return resultData
    }
    operator fun times(other: Matrix): Array<IntArray> {

        val resultData = Array(rows) {IntArray(cols) }
        for (i in 0 until rows) {
            for (j in 0 until other.cols) {
                for (k in 0 until cols) {
                    resultData[i][j] += this.data[i][k] *
other.data[k][j]
                }
            }
```

```
            }
            return resultData
        }
    }
    fun print1(array:Array<IntArray>,row: Int,col: Int) {
        println(" ( $row x $col Matrix):")
        for (i in 0 until row)
        {
            for(j in 0 until col)
            {
                print("${array[i][j]}\t")
            }
            println()
        }
    }
    fun main()
    {
        val a1=arrayOf(intArrayOf(3,-2,5), intArrayOf(3,0,4))
        var a2=arrayOf(intArrayOf(2,3), intArrayOf(-9,0),
    intArrayOf(0,4))
        var a3=arrayOf(intArrayOf(6,3), intArrayOf(9,0),
    intArrayOf(5,4))
        var firstmatrix=Matrix(a1,2,3)
        var secondmatrix=Matrix(a2,3,2)
        var secondmatrix1=Matrix(a3,3,2)
        println("*****************Addition*****************")
        print("Matirx:1")
        print1(a2,3,2)
        print("Matrix:2")
        print1(a3,3,2)
        print("Addition:")
        var plusmatrix=secondmatrix+secondmatrix1
        print1(plusmatrix,3,2)
        println("*****************Subtraction*****************")
        print("Matirx:1")
        print1(a3,3,2)
        print("Matrix:2")
```

```
        print1(a2,3,2)
        print("Subtraction:")
        var minusmatrix=secondmatrix1-secondmatrix
        print1(minusmatrix,3,2)
        println("******************Subtraction*****************")
        print("Matirx:1")
        print1(a1,2,3)
        print("Matrix:2")
        print1(a2,3,2)
        print("Multiplication:")
        var multimatrix=firstmatrix*secondmatrix
        print1(multimatrix,2,2)
}
```

Output:

```
"C:\Program Files\Java\jdk-20\bin\java.exe" "
******************Addition*****************
Matirx:1 ( 3 x 2 Matrix):
2   3
-9  0
0   4
Matrix:2 ( 3 x 2 Matrix):
6   3
9   0
5   4
Addition: ( 3 x 2 Matrix):
8   6
0   0
5   8
******************Subtraction***************
Matirx:1 ( 3 x 2 Matrix):
6   3
9   0
5   4
Matrix:2 ( 3 x 2 Matrix):
2   3
-9  0
0   4
```

```
"C:\Program Files\Java\jdk-20\bin\java.exe" "
******************Addition*****************
Matirx:1 ( 3 x 2 Matrix):
2   3
-9  0
0   4
Matrix:2 ( 3 x 2 Matrix):
6   3
9   0
5   4
Addition: ( 3 x 2 Matrix):
8   6
0   0
5   8
******************Subtraction***************
Matirx:1 ( 3 x 2 Matrix):
6   3
9   0
5   4
Matrix:2 ( 3 x 2 Matrix):
2   3
-9  0
0   4
```