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Part-I
Introduction of JAVA

Practical No: 01

AIM: Write a program to display two messages in two separate lines

Solution

Practical1.java

```
package com.jayshil.javaapp;  
public class Practical1 {  
    public static void main(String[] args) {  
        System.out.println("I am Jayshil\nI Love to learn");  
    }  
}
```

Output

```
Run: Practical1 x  
D:\softwares\Java\bin\java.exe "-javaagent:D:\softwares\Java int  
I am Jayshil  
I Love to learn  
Process finished with exit code 0  
Run TODO Problems Terminal Build
```



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Practical No: 02

AIM: Write a program to display a string with an embedded quote. For example:
Shastri said:” Sachin has played a game of his life”.

Solution

Practical2.java

```
package com.jayshil.javaapp;  
  
public class Practical2 {  
    public static void main(String[] args) {  
        System.out.println("\"When the snows fall and  
the white winds blow,\nthe lone wolf dies, but the  
pack survives\"");  
    }  
}
```

Output

```
Run: Practical2 x  
D:\softwares\Java\bin\java.exe "-javaagent:D:\softwares\Java\intelli  
"When the snows fall and the white winds blow,  
the lone wolf dies, but the pack survives"  
  
Process finished with exit code 0  
  
Run | TODO | Problems | Terminal | Build  
Build completed successfully in 1 sec, 497 ms (moments ago)
```



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Practical No: 03

AIM: Write a program for calculating the Fibonacci series.

Solution

Practical3.java

```
package com.jayshil.javaapp;

public class Practical3 {
    public static void main(String[] args) {

        int first=0;                // to start Fibonacci series we
        int second=1;               // should have initial 2 values
        int temp1;
        System.out.print(first+" ");
        System.out.print(second+" ");

        for(int i=0;i<25;i++)        // Loop iterates 25 times
        {
            temp1=first+second;
            System.out.print(temp1+" ");
            first=second;             // exchanging the values to continue the loop
            second=temp1;
        }
    }
}
```

Output

```
Run: Practical3 x
D:\softwares\Java\bin\java.exe "-javaagent:D:\softwares\Java\intellij\IntelliJ IDEA Community Edition 2020.3.2\lib\idea
0 1 1 2 3 5 8 13 21 34 55 89 144 233 377 610 987 1597 2584 4181 6765 10946 17711 28657 46368 75025 121393
Process finished with exit code 0
```



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Practical No: 04

AIM: Write a program to add two numbers without command-line arguments

Solution

Practical4.java

```
package com.jayshil.javaapp;  
  
public class Practical4 {  
    public static void main(String[] args) {  
        int a=5,b=8;  
        System.out.println("The sum is: "+(a+b));  
    }  
}
```

Output

```
Run: Practical4 x  
D:\softwares\Java\bin\java.exe "-javaagent:D:\softwares\Java\intelliJ\IntelliJ IDEA Co  
The sum is: 13  
Process finished with exit code 0  
Build completed successfully in 1 sec, 425 ms (moments ago)
```



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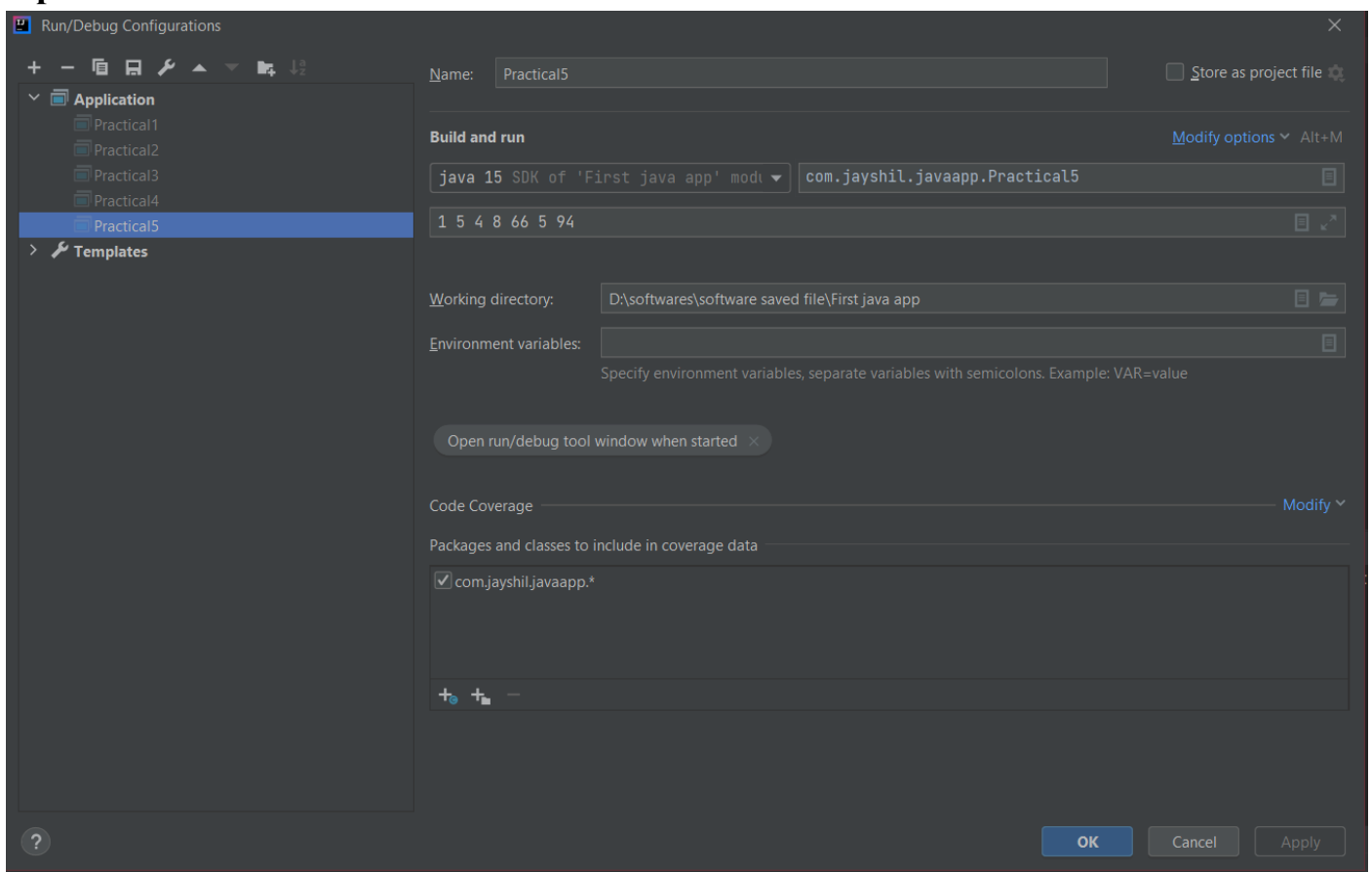


Part-II
Command line arguments and loops concept

Practical No: 05

AIM: Write a program to print the second element of command line argument.

Input:-





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Solution

Practical5.java

```
package com.jayshil.javaapp;  
  
public class Practical5 {  
    public static void main(String[] args) {  
        System.out.println(args[1]);  
    }  
}
```

Output

```
Run: Practical5 x  
D:\softwares\Java\bin\java.exe "-javaagent:D:\softwares\Java intelliJ\IntelliJ  
5  
Process finished with exit code 0  
Run TODO Problems Terminal Build  
All files are up-to-date (a minute ago)
```



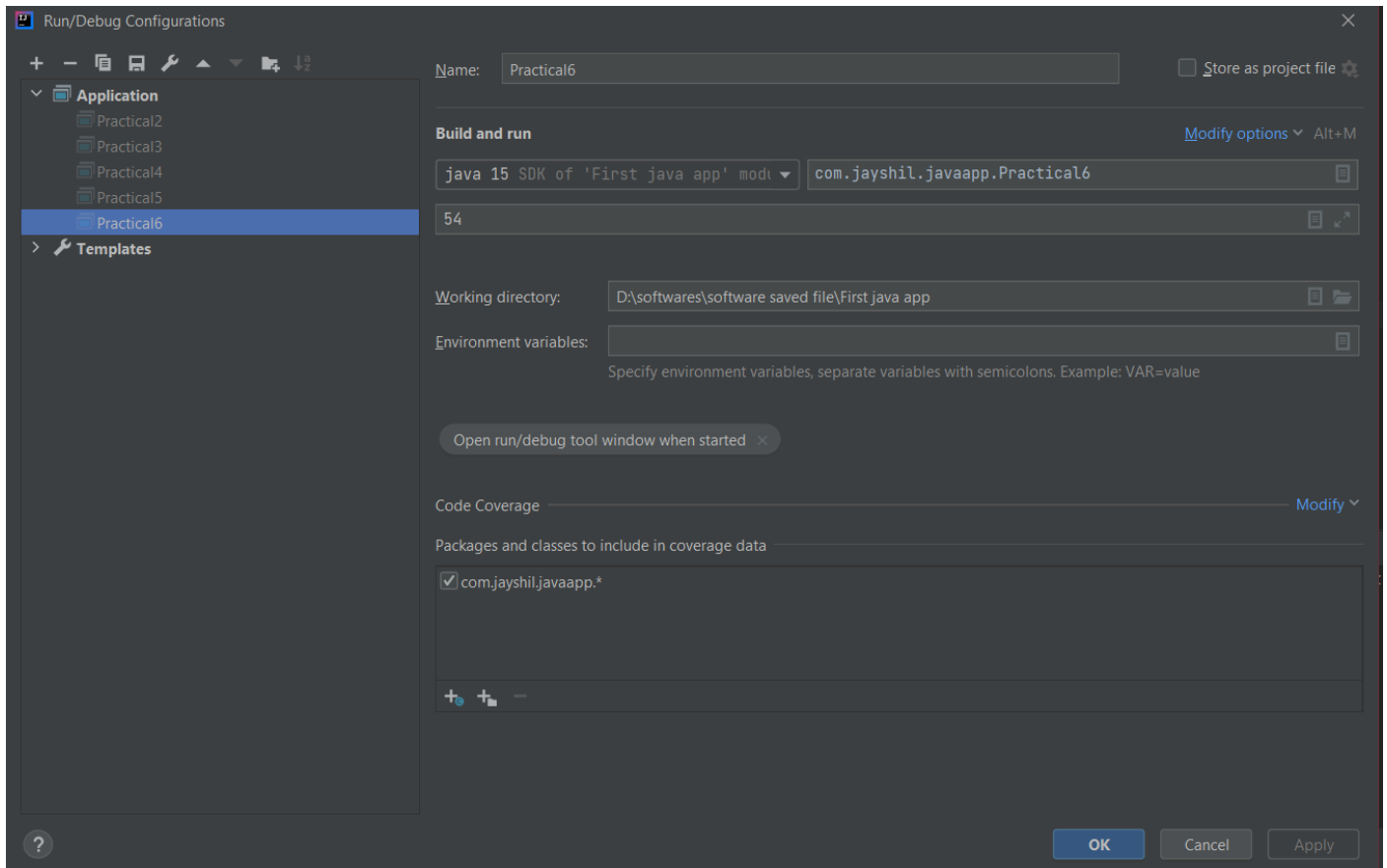
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Practical No: 06

AIM: Write a program to find out that the given no number is odd or even (pass argument in command line argument).

Input:-





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Solution

Practical6.java

```
package com.jayshil.javaapp;

public class Practical6 {

    public static void main(String[] args) {
        int number = Integer.parseInt(args[0]);
        if ((number%2) == 0) {
            System.out.println("The number is even");
        } else {
            System.out.println("The number is odd");
        }
    }
}
```

Output

```
Run: Practical6 x
D:\softwares\Java\bin\java.exe "-javaagent:D:\softwares\Java\int
The number is even
Process finished with exit code 0
Build completed successfully in 1 sec, 604 ms (2 minutes ago)
```




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Practical No: 07

AIM: Write a program in java to find the factorial of a given number (While loop).

Solution

Practical7.java

```
package com.jayshil.javaapp;

public class Practical7 {
    public static void main(String[] args) {
        int given_number = 7;
        long factorial_ans = 1;
        int temp = 1;
        while (temp<=given_number)
        {
            factorial_ans=factorial_ans*temp;
            temp++;
        }
        System.out.println("The factorial is :
        "+factorial_ans);
    }
}
```

Output

```
Run: Practical7 x
D:\softwares\Java\bin\java.exe "-javaagent:D:\softwares\Java\intelliJ\IntelliJ IDEA
The factorial is : 5040
Process finished with exit code 0
```

Build completed successfully in 1 sec, 537 ms (moments ago)



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Practical No: 08

AIM: Write a program in java to find the largest among three numbers (if else statement).

Solution

Practical8.java

```
package com.jayshil.javaapp;

public class Practical8 {
    public static void main(String[] args) {
        int first_num=41,second_num=54,third_num=884;
        if(first_num>second_num)
        {
            if(first_num>third_num)
            {
                System.out.println("The largest number is :"+first_num);
            }
            else {
                System.out.println("The largest number is :"+third_num);
            }
        }
        else if(second_num>third_num)
        {
            System.out.println("The largest number is :"+second_num);
        }
        else
        {
            System.out.println("The largest number is :"+third_num);
        }
    }
}
```



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Output

```
Run: Practical8 x
D:\softwares\Java\bin\java.exe "-javaagent:D:\softwares\Java\intelliJ\IntelliJ IDEA Commu
The largest number is :884
Process finished with exit code 0
```

Build completed successfully in 1 sec, 480 ms (moments ago)



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Practical No: 09

AIM: Write a program in java to swap two numbers without using auxiliary memory location (Using Bitwise XOR operation).

Solution

Practical9.java

```
package com.jayshil.javaapp;

public class Practical9 {
    public static void main(String[] args) {
        int first_num = 7, second_num=15;
        System.out.println("Before swap the first number was :"+first_num);
        System.out.println("Before swap the second number was :"+second_num);
        first_num = first_num^second_num;
        second_num = first_num^second_num;
        first_num = first_num^second_num;
        System.out.println("After swap the first number is :"+first_num);
        System.out.println("After swap the second number is :"+second_num);
    }
}
```

Output

```
Run: Practical9 x
D:\softwares\Java\bin\java.exe "-javaagent:D:\softwares\Java
Before swap the first number was :7
Before swap the second number was :15
After swap the first number is :15
After swap the second number is :7
Process finished with exit code 0
```

Build completed successfully in 1 sec, 625 ms (2 minutes ago)



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Practical No: 10

AIM: Generate the following output, using the control statements learnt in the class:

1111
111
11
1

Solution

Practical10.java

```
package com.jayshil.javaapp;

public class Practical10 {
    public static void main(String[] args) {
        for (int i=0;i<4;i++)
        {
            for(int j=i; j<4 ; j++)
            {
                System.out.print("1");
            }
            System.out.println("");
        }
    }
}
```

Output

```
D:\softwares\Java\bin\java.exe "-javaagent:D:\softwares\Java\intelliJ\IntelliJ IDEA Community Edition 2020.3.1\lib\idea_rt.jar" com.jayshil.javaapp.Practical10
1111
111
11
1
Process finished with exit code 0
```



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Practical No: 11

AIM: Try a program to display in which season the month of April lies. Use the 'switch' statement.

Hint: We have four seasons: Summer, Winter, Autumn and Spring.

Months: 12, 1, 2 come in Winter.

Months: 3, 4, 5 come in Spring.

Months: 6, 7, 8 come in Summer.

Months: 9, 10, 11 come in Autumn.

Solution

Practical11.java

```
package com.jayshil.javaapp;

public class Practical11 {
    public static void main(String[] args) {
        int month=4;
        switch (month)
        {
            case 12,1,2:
                System.out.println("April lies in Winter");
                break;
            case 3,4,5:
                System.out.println("April lies in Spring");
                break;
            case 6,7,8:
                System.out.println("April lies in Summer");
                break;
            case 9,10,11:
                System.out.println("April lies in Autumn");
                break;
        }
    }
}
```



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Output

```
Run: Practical11 x
D:\softwares\Java\bin\java.exe "-javaagent:D:\softwares\Java int
April lies in Spring
Process finished with exit code 0
Build completed successfully in 1 sec, 368 ms (a minute ago)
```



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Part-III
Operators & Typecasting

Practical No: 12

AIM: Write a program to demonstrate the concept of the operators. (Arithmetic, logical, bitwise, ternary, relational).

Solution

Practical13.java

```
package com.jayshil.javaapp;

public class Practical12 {
    public static void main(String[] args) {

        // declare variables
        int a = 12, b = 5;
        System.out.println("*****Arithmetic Operators*****");

        // addition operator
        System.out.println("a + b = " + (a + b));

        // subtraction operator
        System.out.println("a - b = " + (a - b));

        // multiplication operator
        System.out.println("a * b = " + (a * b));

        // division operator
        System.out.println("a / b = " + (a / b));

        // modulo operator
        System.out.println("a % b = " + (a % b));

        System.out.println("*****Logical Operators*****");
        // && operator
        System.out.println("(5 > 3) && (8 > 5) : "+((5 > 3) && (8 > 5))); // true
        System.out.println("(5 > 3) && (8 < 5) : "+((5 > 3) && (8 < 5))); // false

        // || operator
        System.out.println("(5 < 3) || (8 > 5) : "+((5 < 3) || (8 > 5))); // true
        System.out.println("(5 > 3) || (8 < 5) : "+((5 > 3) || (8 < 5))); // true
        System.out.println("(5 < 3) || (8 < 5) : "+((5 < 3) || (8 < 5))); // false

        // ! operator
        System.out.println("!(5 == 3) : "+(!(5 == 3))); // true
        System.out.println("!(5 > 3) : "+(!(5 > 3))); // false

        System.out.println("*****Bitwise Operators*****");
        int c = 0b111, d = -7;
        // bitwise complement
        System.out.println("~7 : "+~c);

        // left shift operator
        int temp = c<<1;
```




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```
System.out.println("7<<1 : "+temp);

// right shift operator
temp = c >> 1;
System.out.println("7>>1 : "+temp);

// Unsigned right shift
temp = d>>>1;
System.out.println("-7>>>1 : "+temp);

// bitwise and
System.out.println("0b010 & 0b011 : "+(0b010 & 0b011));

// bitwise exclusive or
System.out.println("0b010 ^ 0b011 : "+(0b010 ^ 0b011));

System.out.println("/*****Ternary Operators*****/");

int februaryDays = 29;
String result;

// ternary operator
result = (februaryDays == 28) ? "Not a leap year" : "Leap year";
System.out.println(result);

int e = 7, f = 11;

System.out.println("/*****Relational Operators*****/");
// value of a and b
System.out.println("e is " + e + " and f is " + f);

// == operator
System.out.println("e == f : "+(e == f)); // false

// != operator
System.out.println("e != f : "+(e != f)); // true

// > operator
System.out.println("e > f : "+(e > f)); // false

// < operator
System.out.println("e < f : "+(e < f)); // true

// >= operator
System.out.println("e >= f : "+(e >= f)); // false

// <= operator
System.out.println("e <= f : "+(e <= f)); // true
}
```

Output



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```
Run: Practical12 x
D:\softwares\Java\bin\java.exe "-javaagent:D:\softwares\Java\intelliJ\IntelliJ IDEA Community
/*****Arithmetic Operators*****/
a + b = 17
a - b = 7
a * b = 60
a / b = 2
a % b = 2
/*****Logical Operators*****/
(5 > 3) && (8 > 5) : true
(5 > 3) && (8 < 5) : false
(5 < 3) || (8 > 5) : true
(5 > 3) || (8 < 5) : true
(5 < 3) || (8 < 5) : false
!(5 == 3) : true
!(5 > 3) : false
/*****Bitwise Operators*****/
~7 : -8
7<<1 : 14
7>>1 : 3
-7>>>1 : 2147483644
0b010 & 0b011 : 2
0b010 ^ 0b011 : 1
/*****Ternary Operators*****/
Leap year

/*****Ternary Operators*****/
Leap year
/*****Relational Operators*****/
e is 7 and f is 11
e == f : false
e != f : true
e > f : false
e < f : true
e >= f : false
e <= f : true

Process finished with exit code 0
|
```



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Practical No: 13

AIM: Write a program to display a string with an embedded quote. For example:
Shastri said:” Sachin has played a game of his life”.

Solution

Practical13.java

```
package com.jayshil.javaapp;

public class Practical13 {
    public static void main(String[] args) {
        int a = 27;
        double converted=(double) a;
        System.out.println("original Int value : "+a);
        System.out.println("Int to double : "+converted);

        double newDouble = 9.78;
        int newInt = (int) newDouble;
        System.out.println("");
        System.out.println("original double value: "+newDouble);
        System.out.println("Double to Int: "+newInt);

        int num = 10;
        System.out.println("");
        System.out.println("The integer value is: " + num);
        // converts int to string type
        String data = String.valueOf(num);
        System.out.println("The string value is: " + data);

        System.out.println("");
        String str = "15";
        System.out.println("The string value is: " + str);
        // convert string variable to int
        int number = Integer.parseInt(str);
        System.out.println("The integer value is: " + number);
    }
}
```

Output



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```
Run: Practical13 x
D:\softwares\Java\bin\java.exe "-javaagent:D:\softwares\Java\intelliJ\IntelliJ IDEA Community
original Int value : 27
Int to double : 27.0

original double value: 9.78
Double to Int: 9

The integer value is: 10
The string value is: 10

The string value is: 15
The integer value is: 15

Process finished with exit code 0
```

Run | TODO | Problems | Terminal | Build

Build completed successfully in 1 sec, 18 ms (a minute ago)



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Part-IV Array

Practical No: 14

AIM: Demonstrate how to create and initialize different types of arrays like 1D, 2D and multidimensional.

Solution

Practical14.java

```
package com.jayshil.javaapp;

public class Practical14 {
    public static void main(String[] args) {
        // one dimensional array
        System.out.print("One dimensional array");
        int month_days[] = {1,2,3,4,5};
        System.out.println("");
        for(int a=0;a<5;a++)
        {
            System.out.println(month_days[a]);
        }

        // two dimensional array
        System.out.println("");
        System.out.println("Two dimensional array");
        int twoD[][]=new int[4][5];
        int i,j,k=0;

        for (i=0;i<4;i++){
            for (j=0;j<5;j++){
                twoD[i][j]=k;
                k++;
            }
        }
        for (i=0;i<4;i++){
            for (j=0;j<5;j++){
                System.out.print(twoD[i][j]+" ");
            }
            System.out.println();
        }

        // Multidimensional array
        System.out.println("");
        System.out.println("Multidimensional array");
        int mulD[][]=new int[4][];
        mulD[0]=new int[1];
        mulD[1]=new int[2];
    }
}
```



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```
mulD[2]=new int[3];
mulD[3]=new int[4];

int l,m,n =0;

for (l=0;l<4;l++)
    for (m=0;m<l+1;m++)
    {
        mulD[l][m]=n;
        n++;
    }
for(l=0;l<4;l++){
    for (m=0;m<l+1;m++)
        System.out.print(mulD[l][m]+" ");
    System.out.println();
}
}
```

Output

```
Run: Practical14 x
D:\softwares\Java\bin\java.exe "-javaagent:D:\softwares\Java\intelliJ\IntelliJ IDEA Community Edition 2020.3\lib\idea_rt.jar=2020.3:D:\softwares\Java\intelliJ\IntelliJ IDEA Community Edition 2020.3"
One dimensional array
1
2
3
4
5

Two dimensional array
0 1 2 3 4
5 6 7 8 9
10 11 12 13 14
15 16 17 18 19

Multidimensional array
0
1 2
3 4 5
6 7 8 9

Process finished with exit code 0

Build completed successfully in 1 sec, 503 ms (moments ago)
```



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Practical No: 15

AIM: Write a program for sorting of integer numbers.

Solution

Practical15.java

```
package com.jayshil.javaapp;

public class Practical15 {
    public static void main(String[] args) {

        //Initialize array
        int [] arr = new int [] {5, 2, 8, 7, 1};
        int temp = 0;

        //Displaying elements of original array
        System.out.println("Elements of original array: ");
        for (int i = 0; i < arr.length; i++) {
            System.out.print(arr[i] + " ");
        }

        //Sort the array in ascending order
        for (int i = 0; i < arr.length; i++) {
            for (int j = i+1; j < arr.length; j++) {
                if(arr[i] > arr[j]) {
                    temp = arr[i];
                    arr[i] = arr[j];
                    arr[j] = temp;
                }
            }
        }

        System.out.println();

        //Displaying elements of array after sorting
        System.out.println("Elements of array sorted in ascending order: ");
        for (int i = 0; i < arr.length; i++) {
            System.out.print(arr[i] + " ");
        }
    }
}
```



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Output

```
Run: Practical15 x
D:\softwares\Java\bin\java.exe "-javaagent:D:\softwares\Java\intelliJ\IntelliJ IDEA Community Edition 2020.3.2\
Elements of original array:
5 2 8 7 1
Elements of array sorted in ascending order:
1 2 5 7 8
Process finished with exit code 0
```




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Practical No: 16

AIM: Write a program that creates a 2-D array with float values the first element should be an array containing - 50.5, the second element should be an array containing 500.1 & 70.70, and the third element should be an array containing 100.9, 0.5 & 20.20. Declare, allocate & initialize the array. Also Display its length & elements.

Solution

Practical16.java

```
package com.jayshil.javaapp;

public class Practical16 {
    public static void main(String[] args) {
        double m[][]={
            {50.5},
            {500.1,70.70},
            {100.9,0.5,20.20}
        };
        for (int i=0;i<3;i++)
        {
            for (int j=0;j<=i;j++)
            {
                System.out.print(m[i][j]+" ");
            }
            System.out.println("");
        }
        int row_num = m.length;
        int column_num_0= m[0].length;
        int column_num_1 = m[1].length;
        int column_num_2 = m[2].length;
        System.out.println("In jagged array number of rows :"+row_num);
        System.out.print("In jagged array number of columns :"+column_num_0);
        System.out.print(", "+column_num_1+", "+column_num_2);

    }
}
```



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Output

```
Run: Practical16 x
D:\softwares\Java\bin\java.exe "-javaagent:D:\softwares\Java\intell
50.5
500.1 70.7
100.9 0.5 20.2
In jagged array number of rows :3
In jagged array number of columns :1, 2, 3|
Process finished with exit code 0

Run TODO Problems Terminal Build
Build completed successfully in 971 ms (a minute ago)
```



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Practical No: 17

AIM: Write a program to multiply two matrices.(3 X 3).

Solution

Practical17.java

```
package com.jayshil.javaapp;

public class Practical17 {
    public static void main(String args[]){

        int a[][]={{1,1,1},{2,2,2},{3,3,3}};
        int b[][]={{1,1,1},{2,2,2},{3,3,3}};

        int c[][]=new int[3][3];

        for(int i=0;i<3;i++){
            for(int j=0;j<3;j++){
                c[i][j]=0;
                for(int k=0;k<3;k++){
                    {
                        c[i][j]+=a[i][k]*b[k][j];
                    }
                }
                System.out.print(c[i][j]+" ");
            }
            System.out.println();
        }
    }
}
```



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Output

```
Run: Practical17 x
D:\softwares\Java\bin\java.exe "-javaagent:D:\softwares\Java\intellij\I
6 6 6
12 12 12
18 18 18 |
Process finished with exit code 0
```

Build completed successfully in 981 ms (a minute ago)



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Practical No: 18

AIM: Write a program to demonstrate StringBuffer and StringTokenizer class with different methods.

Solution

Practical18.java

```
package com.jayshil.javaapp;
import java.util.StringTokenizer;
public class Practical18 {
    public static void main(String[] args) {
        StringTokenizer str=new StringTokenizer("I am Jayshil Patel"," ");
        while(str.hasMoreTokens())
        {
            System.out.println(str.nextToken());
        }
    }
}
// this program uses class string tokenizer
// we have used hasMoreTokens
// StringTokenizer to separate string on basis of whitespace
// and nextToken
```

Output



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Part-V Class

Practical No: 19

AIM: Write an application that declares a class named person. It should have instance variables to record name, age & salary. This should be of type's string, integer & float. Use the new operator to create a person object. Set & display its instance variable.

Solution

Practical19.java

```
package com.jayshil.javaapp;

class Person{
    String Name = "Jayshil Patel";
    int Age = 20;
    float Salary = 10000.0f;
    void display()
    {
        System.out.println("Name is :"+Name);
        System.out.println("Age is :"+Age);
        System.out.println("Salary is :"+Salary);
    }
}

public class Practical19 {
    public static void main(String[] args) {
        Person person = new Person();
        person.display();
    }
}

package com.jayshil.javaapp;

class Person{
    String Name = "Jayshil Patel";
    int Age = 20;
    float Salary = 10000.0f;
    void display()
    {
        System.out.println("Name is :"+Name);
```



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```
        System.out.println("Age is :"+Age);  
        System.out.println("Salary is :"+Salary);  
    }  
}  
  
public class Practical19 {  
    public static void main(String[] args) {  
        Person person = new Person();  
        person.display();  
    }  
}
```



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Output

```
Run: Practical19 x
D:\softwares\Java\bin\java.exe "-javaagent:D:\softwares\Java\
Name is :Jayshil Patel
Age is :20
Salary is :10000.0

Process finished with exit code 0
```

Run | TODO | Problems | Terminal | Build

All files are up-to-date (moments ago)

```
Run: Practical19 x
D:\softwares\Java\bin\java.exe "-javaagent:D:\softwares\Java inte
Name is :Jayshil Patel
Age is :20
Salary is :10000.0

Process finished with exit code 0
```

Run | TODO | Problems | Terminal | Build

Build completed successfully in 1 sec, 561 ms (3 minutes ago)



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Practical No: 20

AIM: Implement the prog.1 using constructor.

Solution

Practical20.java

```
package com.jayshil.javaapp;  
  
class program1{  
    program1(){  
        System.out.println("My name is Jayshil");  
        System.out.println("I love to learn");  
    }  
}  
  
public class Practical20 {  
    public static void main(String[] args) {  
        program1 obj = new program1();  
    }  
}
```

Output

```
Run: Practical20 x  
D:\softwares\Java\bin\java.exe "-javaagent:D:\softwares\  
My name is Jayshil  
I love to learn  
Process finished with exit code 0  
Run TODO Problems Terminal Build  
Build completed successfully in 2 sec, 826 ms (moments ago)
```



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Practical No:21

AIM: Write an application that define a circle class with 2 constructors the first form expects a double value that represents the radius of a circle, this constructor assumes that circle is centered at the origin. The second form accepts 3 double values, the first 2 arguments define the coordinates of the center & third argument define the radius. Also declare one member function which calculates an area of a circle.

Solution

Practical21.java

```
package com.jayshil.javaapp;

class Circle{
    double Radius;
    double x_coord,y_coord;

    Circle(double Radius){
        this.Radius=Radius;
    }
    Circle(double x_coord,double y_coord, double Radius){
        this.Radius=Radius;
        this.x_coord=x_coord;
        this.y_coord=y_coord;
    }
    void Get_Area(){
        double Area = 3.141*Radius*Radius;
        System.out.println("The Area of the Circle is : "+Area);
    }
}

public class Practical21 {
    public static void main(String[] args) {
        Circle example = new Circle(5.0,7.0,55);
        example.Get_Area();
    }
}
```



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Output

```
Run: Practical21 x
D:\softwares\Java\bin\java.exe "-javaagent:D:\softwares\Java\intellij\IntelliJ
The Area of the Circle is :9501.525
Process finished with exit code 0
Build completed successfully in 1 sec, 653 ms (2 minutes ago)
```



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Practical No: 22

AIM: Create a stack class. Define two methods push and pop that insert elements in the stack and remove the elements from the stack respectively.

Solution

Practical22.java

```
package com.jayshil.javaapp;

class Stack_class{
    // Creating a Stack
    java.util.Stack<String> stackOfCards = new java.util.Stack<>();

    // Pushing new items to the Stack
    void Stack_Push() {
        stackOfCards.push("Jack");
        stackOfCards.push("Queen");
        stackOfCards.push("King");
        stackOfCards.push("Ace");

        System.out.println("Stack => " + stackOfCards);
        System.out.println();
    }

    // Popping items from the Stack
    void Stack_Pop(){
        String cardAtTop = stackOfCards.pop();
        System.out.println("Stack.pop() => " + cardAtTop);
        System.out.println("Current Stack => " + stackOfCards);
        System.out.println();
    }

}

public class Practical22 {
    public static void main(String[] args) {
        Stack_class eg = new Stack_class();
        eg.Stack_Push();
        eg.Stack_Pop();
    }
}
```



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Output

```
Run: Practical22 (1) x
D:\softwares\Java\bin\java.exe "-javaagent:D:\softwares\Java\intelliJ\IntelliJ
Stack => [Jack, Queen, King, Ace]
Stack.pop() => Ace
Current Stack => [Jack, Queen, King]
Process finished with exit code 0
Build completed successfully in 1 sec, 316 ms (3 minutes ago)
```



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Practical No: 23

AIM: Create a program that shows pass by value and pass by reference concept in class.

Solution

Practical23.java

```
package com.jayshil.javaapp;

class Pass_by_reference{
    public static void change(int x)
    {
        x=27;
        System.out.println("The value of x In change :"+x);
    }
}

public class Practical23 {
    //Pass by value

    public static void main(String[] args) {
        // Pass by reference
        Pass_by_reference obj = new Pass_by_reference();
        int x = 72;
        System.out.println("Pass by reference");
        System.out.println("The value before change :"+x);
        obj.change(x);
        System.out.println("The value after change :"+x);
        System.out.println("");
        System.out.println("Pass by Value");
        System.out.println("The value before change :"+x);
        pass_by_value(x);
        System.out.println("The value after change :"+x);
    }

    public static void pass_by_value(int x)
    {
        x=45;
        System.out.println("The value x in change :"+x);
    }
}
```



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Output

```
Run: Practical23 x
D:\softwares\Java\bin\java.exe "-javaagent:D:\softwares\Java\intelli
Pass by reference
The value before change :72
The value of x In change :27
The value after change :72

Pass by Value
The value before change :72
The value x in change :45
The value after change :72

Process finished with exit code 0

Run TODO Problems Terminal Build
Build completed successfully in 1 sec, 447 ms (a minute ago)
```



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Practical No: 24

AIM: Create a program that shows use of static, this keyword.

Solution

Practical24.java

```
package com.jayshil.javaapp;

class static_example{
    static int x = 60;
    static void fun()
    {
        System.out.println("Within Static");
    }
}

class this_example{
    int j;
    this_example(int j){
        this.j=j;
    }
}

public class Practical24 {
    public static void main(String[] args) {
        System.out.println("\nStatic Example");
        static_example.fun();
        System.out.println(static_example.x);
        static_example S1 = new static_example();
        static_example S2 = new static_example();
        System.out.println(S1.x);
        S1.fun();

        System.out.println("\nThis example");
        this_example new_obj = new this_example(5);
        System.out.println("Value of int by using this keyword : "+new_obj.j);
    }
}
```




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Output

```
Run: Practical24 x
D:\softwares\Java\bin\java.exe "-javaagent:D:\softwares\Java\intelliJ\IntelliJ IDEA Commun
Static Example
Within Static
60
60
Within Static

This example
Value of int by using this keyword : 5

Process finished with exit code 0
```

Build completed successfully in 1 sec, 187 ms (a minute ago)