

MCA sem-2

04\_Rajadip\_Chavda

JAVA

---

## Practical Assignment -1

---

```
import java.util.*;
import java.lang.*;
class p1
{
    /*Write a program to print the following pattern :
     ****
     ***
     **
     *
     */
    public static void main(String args[])
    {
        System.out.println("****\n***\n**\n*");
    }
}
```

The screenshot shows a Windows command prompt window titled "Select C:\Windows\System32\cmd.exe". The command history is as follows:

```
D:\VCA\java\assignment>javac 04_Rajadip_Assignment1.java
D:\VCA\java\assignment>java p1
***
```

The window has a dark background and light-colored text. The taskbar at the bottom shows various pinned icons and the system tray with the date and time.

---

```
class p2
```

```
{
```

```
//Write a program that reads a distance in kilometers from the
keyboard and output the distance as miles.
```

```
public static void main(String args[])
```

```
{
```

```
Scanner p2=new Scanner(System.in);
```

```
System.out.println("Enter Value in kilometers :");
```

```
double value=p2.nextDouble();
```

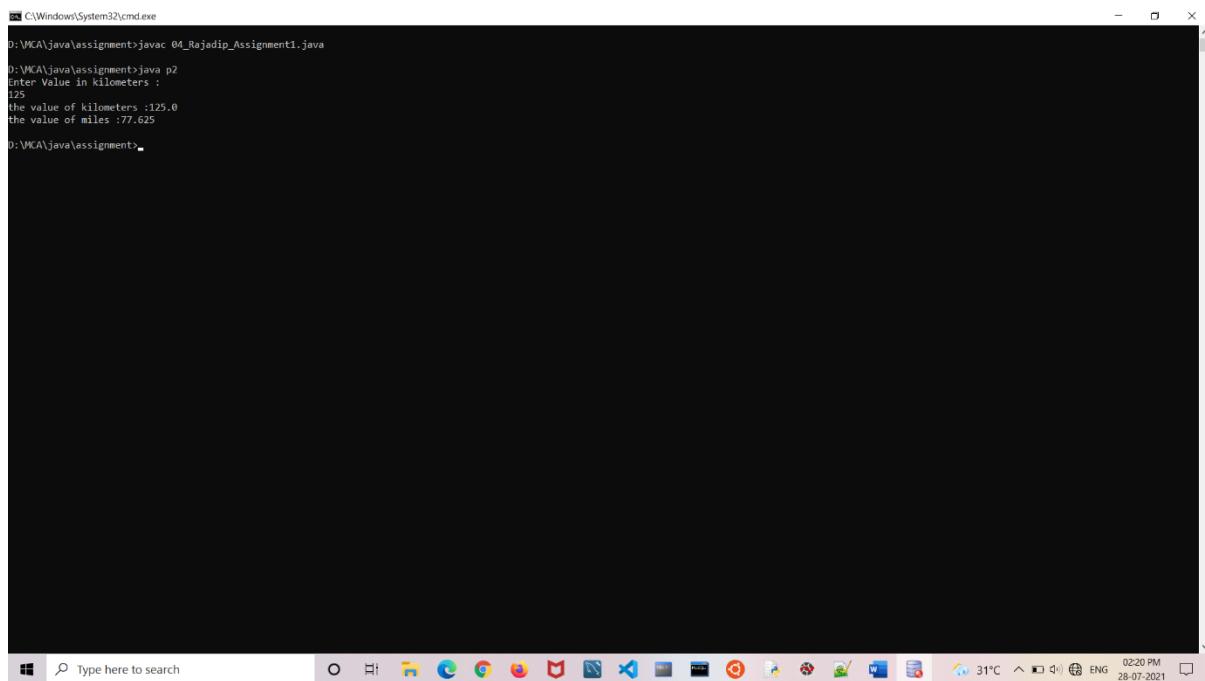
```
double miles=0.621;
```

```
System.out.println("the value of kilometers :" +value);
```

```
System.out.println("the value of miles :" +value*miles);
```

```
}
```

```
}
```



A screenshot of a Windows command prompt window titled 'C:\Windows\System32\cmd.exe'. The window contains the following text:

```
D:\VCA\java\assignment>javac 04_Rajadip_Assignment1.java
D:\VCA\java\assignment>java p2
Enter Value in kilometers :
125
the value of kilometers :125.0
the value of miles :77.625
D:\VCA\java\assignment>
```

The window has a dark background and light-colored text. The taskbar at the bottom shows various application icons and the system clock.

---

```
class p3
```

```
{
```

```
    //Write an application that generates the first 15 numbers in
    the Fibonacci series and first 15 prime numbers.
```

```
    public static void main(String args[])
    {
```

```
        Scanner p3=new Scanner(System.in);
```

```
        System.out.println("how many term of Fibonacci you
want to print: ");
```

```
        int value=p3.nextInt();
```

```
        int a,b;
```

```
        int nextvalue;
```

```
a=0;b=1;  
nextvalue=a+b;  
System.out.println("Fibonacci Series is :");  
System.out.print("0 1");  
for(int i=0;i<=value-3;i++)  
{  
    System.out.print(" "+nextvalue);  
    a=b;  
    b=nextvalue;  
    nextvalue=a+b;  
}
```

```
System.out.println("\n\n*****\n*****\n");
```

```
System.out.println("how many term of Prime number you  
want to print: ");  
  
int prime=p3.nextInt();  
int count=0,number=0,i=1,j=1;  
while(number<prime)  
{  
    j=1;  
    count=0;  
    while(j<=i)
```

```

{
    if(i%j==0)
        count++;

    j++;

}
if(count==2)
{
    System.out.printf("%d ",i);
    number++;

}
i++;

}
}

```

C:\Windows\System32\cmd.exe

D:\MCA\java\assignment>javac 04\_Rajadip\_Assignment1.java

D:\MCA\java\assignment>java p3

how many term of Fibonacci you want to print:

5

Fibonacci Series is :

0 1 1 2 3

\*\*\*\*\*

how many term of Prime number you want to print:

5

2 3 5 7 11

D:\MCA\java\assignment>

The screenshot shows a Windows Command Prompt window titled 'C:\Windows\System32\cmd.exe'. The command 'javac 04\_Rajadip\_Assignment1.java' is run, followed by 'java p3'. The program prompts for the number of terms for the Fibonacci series, which is entered as 5. It then prints the series: 0, 1, 1, 2, 3. A separator line follows, and then it prompts for the number of terms for prime numbers, also entered as 5. It prints the prime numbers: 2, 3, 5, 7, 11.

---

```
class p4
{
    //Write and run a Java program to calculate factorial and the
    cube of the given integer number. Also find the sum and
    multiplication of its digits. Also

    //check whether the no entered is palindrome or not

    static int getsum(int n)

    {
        int sum=0;

        while(n!=0)

        {
            sum=sum+n%10;

            n=n/10;
        }

        return sum;
    }

    public static void main(String args[])
    {
        Scanner p4=new Scanner(System.in);

        System.out.println("\nEnter Integer Number :");

        int number=p4.nextInt();

        int fact=1;

        for(int i=1;i<=number;i++)
    }
```

```
{  
    fact=fact*i;  
}  
System.out.println("factorial is : "+fact);  
  
int cube;  
cube=number*number*number;  
System.out.println("\nCube of Integer number  
"+number+" is : "+cube);
```

```
System.out.println("\nSum of all digits is  
:"+getsum(number));
```

```
int r,sum=0,temp; //It is the number variable to be  
checked for palindrome  
temp=number;  
while(number>0)  
{  
    r=number%10; //getting remainder  
    sum=(sum*10)+r;  
    number=number/10;  
}  
if(temp==sum)
```

```

        System.out.println("\n factorial number is
palindrome number ");

    else

        System.out.println("\n factorial number is not
palindrome");

}

}

```

```

C:\Windows\System32\cmd.exe
D:\MCA\java\assignment>javac 04_Rajadip_Assignment1.java
D:\MCA\java\assignment>java p4
Enter Integer Number :
45
factorial is : 0
Cube of Integer number 45 is : 91125
Sum of all digits is : 9
factorial number is not palindrome
D:\MCA\java\assignment>

```

```

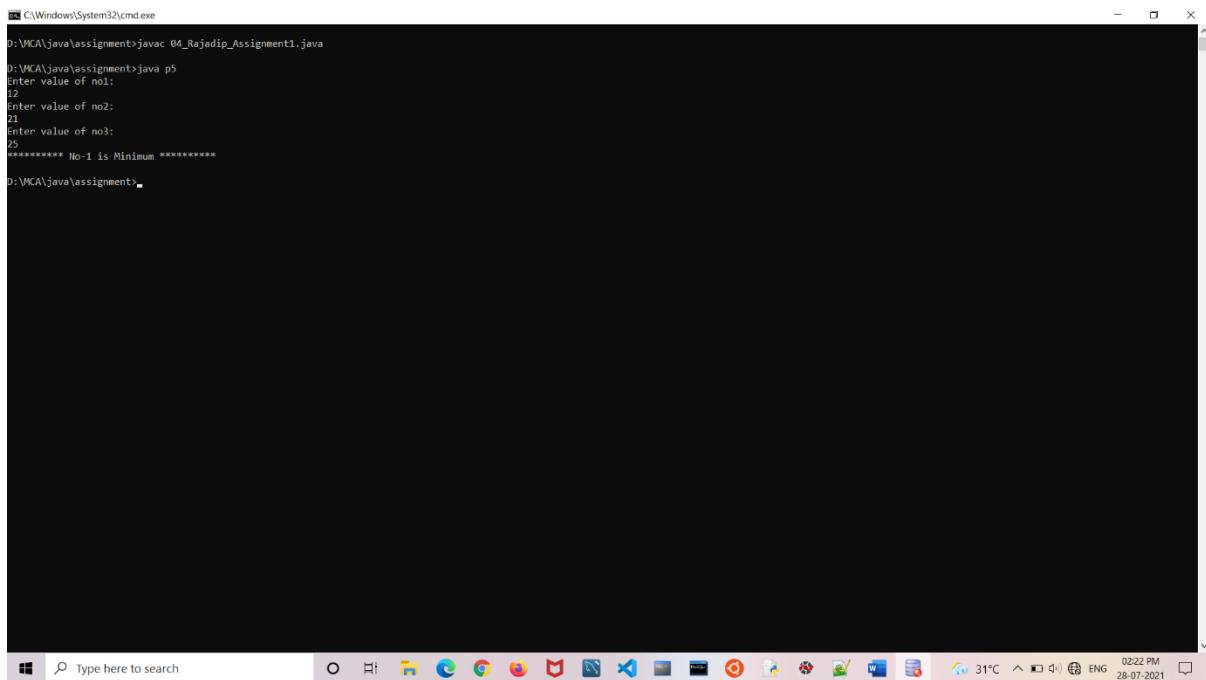
class p5

{
    //write a Java program to calculate the minimum of three
    integer numbers

    public static void main(String args[])

```

```
{\n    Scanner p5=new Scanner(System.in);\n\n    System.out.println("Enter value of no1:");\n\n    int no1=p5.nextInt();\n\n    System.out.println("Enter value of no2:");\n\n    int no2=p5.nextInt();\n\n    System.out.println("Enter value of no3:");\n\n    int no3=p5.nextInt();\n\n    if(no1<no2 & no1<no3)\n    {\n        System.out.println("***** No-1 is Minimum\n*****");\n    }\n\n    else if(no2<no3)\n    {\n        System.out.println("***** No-2 is Minimum\n*****");\n    }\n\n    else\n    {\n        System.out.print("***** No-3 is Minimum\n*****");\n    }\n}\n}
```



C:\Windows\System32\cmd.exe  
D:\VCA\java\assignment>javac 04\_Rajadip\_Assignment1.java  
D:\VCA\java\assignment>java p5  
Enter value of no1:  
12  
Enter value of no2:  
21  
Enter value of no3:  
25  
\*\*\*\*\* No-1 is Minimum \*\*\*\*\*  
D:\VCA\java\assignment>

---

class p6

{

/\*WAP in JAVA that calculates the VAT on an amount of sale.

The program takes amount of sales and VAT rate as input and outputs the total amount inclusive of VAT.\*/

public static void main(String args[])

{

Scanner p6=new Scanner(System.in);

System.out.println("Enter value of sales :");

double sales=p6.nextDouble();

System.out.println("Enter value of VAT(%):");

double vat=p6.nextDouble();

```

        double rate;
        rate=(sales *vat)/100;
        rate=rate+sales;
        System.out.println("Amount with VAT "+rate);
    }

}

```

```

C:\Windows\System32\cmd.exe
D:\VCA\java\assignment>javac 04_Rajadip_Assignment1.java
D:\VCA\java\assignment>java p6
Enter value of sales :
500
Enter value of VAT(%):
12
Amount with VAT 5040.0
D:\VCA\java\assignment>

```

class p7

{

//Use While loop to generate random numbers and maintain a running sum of these values. Terminate when the sum exceeds 20.

//(Note: use Math.random() method to obtain numbers.)

public static void main(String args[])

{

```

int number = 0;

int sum=0;

while(sum<20)

{

    number = 1+(int)(10*Math.random());

    System.out.println("random no :" +number);

    sum+=number;

    System.out.println("current sum :" +sum);

}

System.out.println("*****");

System.out.println("sum :" +sum);

}

```

```

C:\Windows\System32\cmd.exe
D:\VCA\java\assignment>javac 04_Rajadip_Assignment1.java
D:\VCA\java\assignment>java p
random no :8
current sum :8
random no :8
current sum :16
random no :4
current sum :20
*****
sum :20
D:\VCA\java\assignment>

```

---

```
class p8
{
    //Write an application that counts the total number of
    characters in all of its command-line argument

    public static void main(String args[])
    {
        System.out.println("Name is :" +args[0]);

        int count=0;

        String s=args[0];
        for(int i=0;i<s.length();i++)
        {
            if(s.charAt(i)!=' ')
            {
                count++;
            }
        }

        System.out.println("total no of character is :" +count);
    }
}
```

The screenshot shows a Windows Command Prompt window titled 'C:\Windows\System32\cmd.exe'. The command 'javac 04\_Rajadip\_Assignment1.java' is run, followed by 'java p8 rajadip\_chavda'. The output shows the name 'rajadip\_chavda' and a total character count of 13. The desktop taskbar at the bottom includes icons for File Explorer, Edge, Google Chrome, and other applications, along with system status indicators like weather (31°C), battery, and network.

```
C:\Windows\System32\cmd.exe
D:\MCA\java\assignment>javac 04_Rajadip_Assignment1.java
D:\MCA\java\assignment>java p8 rajadip_chavda
Name is :rajadip_chavda
total no of character is :13
D:\MCA\java\assignment>
```

---

```
class p9
```

```
{
```

```
//Write a java program to calculate Simple Interest using
Command Line Arguments. (Hint use Wrapper classes)
```

```
public static void main(String args[])
```

```
{
```

```
    int price=Integer.parseInt(args[0]);
```

```
    int rate=Integer.parseInt(args[1]);
```

```
    int year=Integer.parseInt(args[2]);
```

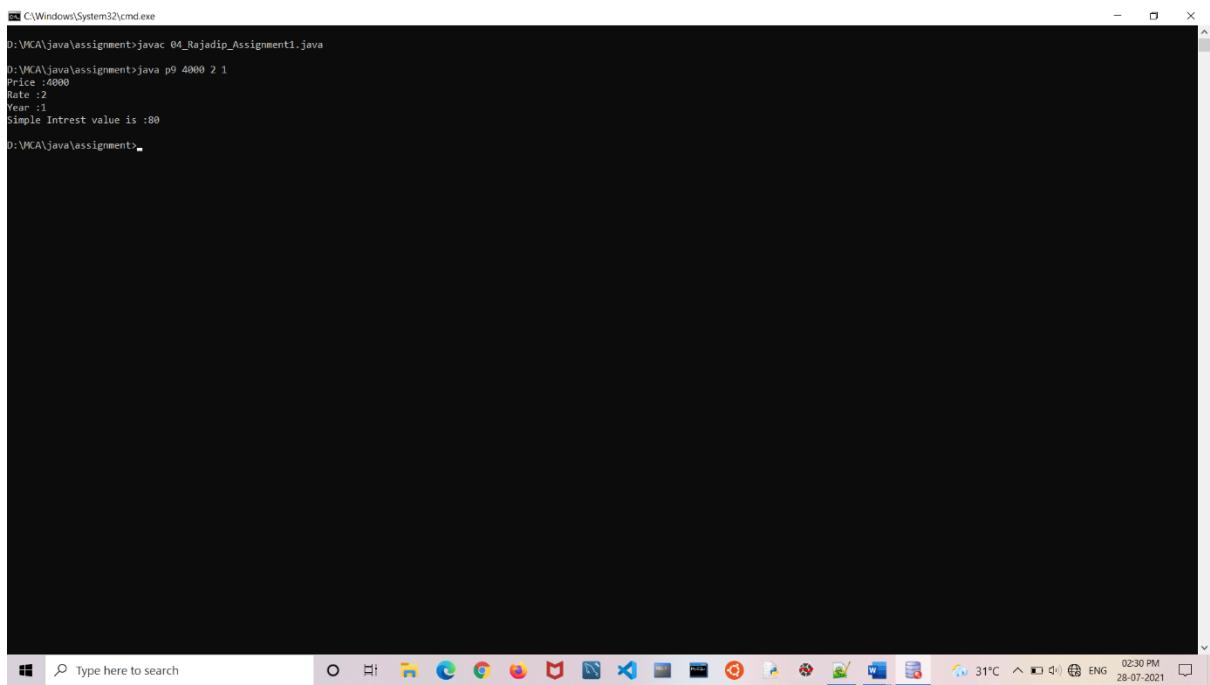
```
    int intrest;
```

```
    System.out.println("Price :" + price);
```

```
    System.out.println("Rate :" + rate);
```

```
    System.out.println("Year :" + year);
```

```
intrest=(price*rate*year)/100;  
System.out.println("Simple Intrest value is :" + intrest);  
}  
}
```



```
C:\Windows\System32\cmd.exe  
D:\VCA\java\assignment>javac 04_Rajadip_Assignment1.java  
D:\VCA\java\assignment>java p9 4000 2 1  
Price :4000  
Rate :2  
Year :1  
Simple Intrest value is :80  
D:\VCA\java\assignment>
```

---

## Practical Assignment - 2

---

```
import java.util.*;  
import java.util.Scanner;  
import java.util.Arrays;
```

```
import java.util.StringTokenizer;
```

```
import java.lang.StringBuffer;
```

```
/*
```

1) Write application that creates an array of double, to provide following functionality.

- display the length of the array and its elements.
- Display an array. (Use for each version of loop for display).
- compute the sume of the squares of these numbers.
- Determine Mean and Median of an array.
- Sort an array – Ascending and Descending. Use any two sorting algorithm. User can also select the sorting method.
- Search an element from the array, i.e. returns the location of the element of an array that matches an indicated value.
- Copy of an array.
- Reverse of an array.

```
*/
```

```
class p1
```

```
{
```

```
    static void sumOfSquares(double[] arr,int n)
```

```
{
```

```
    double avg=0,sum=0;
```

```
    for(double i : arr)
```

```
{
```

```
    avg +=i;  
}  
  
avg = avg /n;  
//System.out.println(avg);  
  
for(double j : arr)  
{  
    //System.out.println(Math.pow((j-avg),2));  
    sum +=Math.pow((j-avg),2);  
}  
  
System.out.println("Sum of Squares = "+sum);  
System.out.println("Mean of Array : "+avg);
```

```
bubbleSort(arr,n);  
//Median of an Array  
  
double m=0;  
  
if(n%2==1)  
{  
    m=arr[(n+1)/2-1];  
}  
  
else  
{  
    m=(arr[n/2-1]+arr[n/2])/2;  
}
```

```
System.out.println("Median :"+m);

}

static void bubbleSort(double[] arr,int n)
{
    double temp;
    for (int i = 0; i < n-1; i++)
    {   for (int j = 0; j < n-i-1; j++)
        {
            if (arr[j] > arr[j+1])
            {
                temp = arr[j];
                arr[j] = arr[j+1];
                arr[j+1] = temp;
            }
        }
    }

    static void selectionSort(double[] arr,int n)
    {
        int min ;
        for(int i=0;i<n-1;i++)
    }
```

```
{  
    min = i;  
    for(int j=i+1;j<n;j++)  
    {  
        if(arr[j] < arr[min])  
            min = j;  
    }  
  
    double temp= arr[min];  
    arr[min] = arr[i];  
    arr[i] =temp;  
}  
  
printArray(arr);  
}  
  
static void printArray(double[] arr)  
{  
    System.out.println("Array Elements are :: ");  
  
    for(double i : arr)  
    {  
        System.out.println(i);  
    }  
}
```

```
static int searchElement(double[] arr,int n,double key)

{
    for(int i=0;i<n;i++)
    {
        if(arr[i] == key)
        {
            return i;
        }
    }
    return 0;
}

static void copyArray(double[] arr,int n)
{
    System.out.println("Copy Array using 3 Method : ");
    double[] arrB = new double[n];
    double[] arrC = new double[n];
    //copy location of array to another array
    arrB = arr;
    printArray(arrB);

    for (int i = 0; i < n; i++)
        arrC[i] = arr[i];
```

```
printArray(arrC);

//array copy using clone
double[] arrD = arr.clone();
printArray(arrD);

}

static void reverseArray(double[] arr,int n)
{
    System.out.println("Reverse Array using ");
    double temp;
    for(int i=0;i<n/2;i++)
    {
        temp = arr[i];
        arr[i] = arr[n-i-1];
        arr[n-i-1] = temp;
    }
    printArray(arr);
}

public static void main(String[] args)
{
    int n;
    Scanner sc = new Scanner(System.in);
```

```
System.out.println("Enter the number of elements u want to  
store : ");
```

```
n = sc.nextInt();
```

```
double arr[] = new double[n];
```

```
System.out.println("Enter Element of the array");
```

```
for(int i=0;i<n;i++)
```

```
{
```

```
    arr[i]=sc.nextDouble();
```

```
}
```

```
System.out.println("Length of the array : "+ n);
```

```
printArray(arr);
```

```
sumOfSquares(arr,n);
```

```
System.out.println();
```

```
int choice;
```

```
System.out.println("Choose Any one algorithm for sorting");
```

```
System.out.println("1.Bubble sort");
```

```
System.out.println("2.Selection Sort");
```

```
choice = sc.nextInt();

if(choice == 1)
{
    bubbleSort(arr,n);
    printArray(arr);
}

else if(choice == 2)
{
    selectionSort(arr,n);
}

else{
    System.out.println("select between 1 | 2 ");
}
```

```
//Searching Element
int loc;
double key=0;

System.out.println("Enter Key Value you want to find : ");
key = sc.nextDouble();
loc = searchElement(arr,n,key);

System.out.println("Location is : "+ loc + " value is : " +
arr[loc]+\n\n");
```

```

//Copy elements of array from one array to another array
copyArray(arr,n);

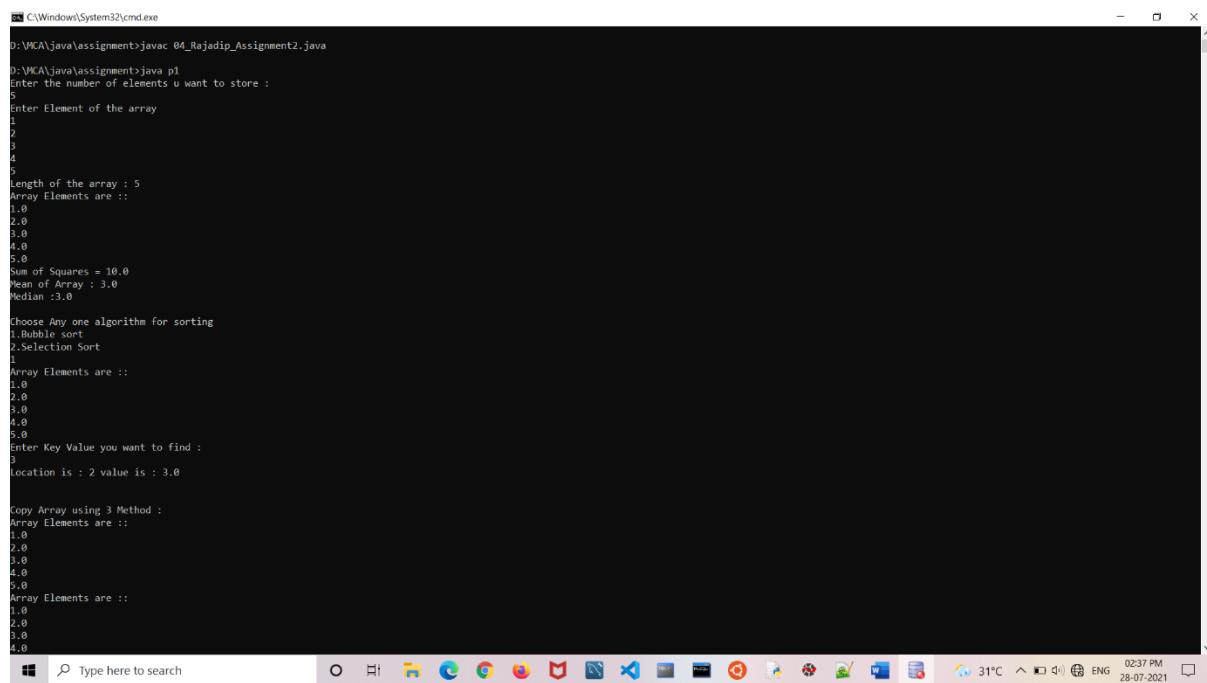
System.out.println();

reverseArray(arr,n);

}

}

```



```

C:\Windows\System32\cmd.exe
D:\VKA\java\assignment>javac 04_Rajadip_Assignment2.java
D:\VKA\java\assignment>java p1
Enter the number of elements u want to store :
5
Enter Element of the array
1
2
3
4
5
Length of the array : 5
Array Elements are ::

1.0
2.0
3.0
4.0
5.0
Sum of Squares = 30.0
Mean of Array : 3.0
Median :3.0

Choose Any one algorithm for sorting
1.Bubble sort
2.Selection Sort
1
Array Elements are ::

1.0
2.0
3.0
4.0
5.0
Enter Key Value you want to find :
3
Location is : 2 value is : 3.0

Copy Array using 3 Method :
Array Elements are ::

1.0
2.0
3.0
4.0
5.0
Array Elements are ::

1.0
2.0
3.0
4.0
5.0

```

```
C:\Windows\System32\cmd.exe
8.0
9.0
Enter Key Value you want to find :
3
Location is : 2 value is : 3.0

Copy Array using 3 Method :
Array Elements are :: 
1.0
2.0
3.0
4.0
5.0
Array Elements are :: 
1.0
2.0
3.0
4.0
5.0
Array Elements are :: 
1.0
2.0
3.0
4.0
5.0

Reverse Array using 
Array Elements are :: 
5.0
4.0
3.0
2.0
1.0
D:\MCA\java\assignment>
```

/\*

2) Write a program in Java to create variable size array. Data can be numeric.

- Flush an array
- add a number at a specified location in an array.
- display the array

\*/

class p2

{

    static void printArray(int[] arr,int n)

{

```
System.out.println("Array is : ");
for(int i=0;i<n;i++)
{
    System.out.print(arr[i]+ " ");
}
public static void main(String[] args)
{
    Scanner sc = new Scanner(System.in);
    int n;
    System.out.println("Enter how many numbers add in array : ");
    n = sc.nextInt();
    System.out.println("Enter :");
    int[] arr = new int[n];
    for(int i=0;i<n;i++)
    {
        arr[i] = sc.nextInt();
    }
    printArray(arr,n);

    int key,val;
    System.out.println("\nIndex No: ");
    key = sc.nextInt();
    System.out.println("\nEnter value for Index : ");
```

```

val = sc.nextInt();

if(key < n)

{
    arr[key] = val;

}

else{

    System.out.println("Index is greater than range");

}

printArray(arr,n);

Arrays.fill(arr,0);

System.out.println("\nArray flushed successfully \n" );

}

}

```

```

C:\Windows\System32\cmd.exe
D:\VCA\java\assignment>javac 04_Rajadip_Assignment2.java
D:\VCA\java\assignment>java p2
Enter how many numbers add in array :
5
Enter :
12
45
89
65
23
Array is :
12 45 89 65 23
Index No:
3
Enter value for Index :
100
Array is :
12 45 89 100 23
Array flushed successfully

D:\VCA\java\assignment>

```

The screenshot shows a Windows Command Prompt window titled 'cmd.exe'. The command 'javac 04\_Rajadip\_Assignment2.java' is run to compile the Java file 'p2'. Subsequently, the command 'java p2' is run to execute the program. The program asks for the number of elements in the array (5), then prompts for each element (12, 45, 89, 65, 23) and prints the array. It then asks for an index (3) and a value (100) to update the array at index 3. Finally, it prints the updated array (12, 45, 89, 100, 23) and outputs 'Array flushed successfully'. The taskbar at the bottom shows various application icons.

---

```
/*
3) Program in Java to find A+B, A-B, A*B and transpose of A, where A
is a matrix of 3*3 and B is a matrix of 3*4.

Take the values in matrixes A and B from the user.

*/
```

```
class p3
{
    static void matrixMulti(int[][] A,int[][] B,int row1,int row2,int col2)
    {
        int c[][] = new int[row1][col2];
        System.out.println("MAtrix Multiplication : ");
        for(int i=0;i<row1;i++)
        {
            for(int j=0;j<col2;j++)
            {
                c[i][j]=0;
                for(int k=0;k<row2;k++)
                {
                    c[i][j]+=A[i][k]*B[k][j];
                }
                System.out.print(c[i][j]+" ");
            }
            System.out.println();
        }
    }
}
```

```
    }
}

static void summationMatrix(int[][] A,int[][] B ,int row1,int col1)
{
    int c[][] = new int[row1][col1];
    for(int i=0;i<row1;i++)
    {
        for(int j=0;j<col1;j++)
        {
            c[i][j] +=A[i][j] + B[i][j];
        }
    }
    System.out.println("Matrix Addition A+B :");
    printMatrix(c,row1,col1);
}

static void substractionMatrix(int[][] A,int[][] B ,int row1,int col1)
{
    int c[][] = new int[row1][col1];
    for(int i=0;i<row1;i++)
    {
        for(int j=0;j<col1;j++)
        {
            c[i][j] +=A[i][j] - B[i][j];
        }
    }
}
```

```
}

System.out.println("Matrix Substraction A-B :");

printMatrix(c,row1,col1);

}

static void printMatrix(int[][] arr,int row1,int col2)

{

System.out.println("MAtrix :: ");

for(int i=0;i<row1;i++)

{

for(int j=0;j<col2;j++)

{

System.out.print(arr[i][j] + " ");

}

System.out.println();

}

}

public static void main(String[] args)

{

/* A+B A-B A*B */

Scanner sc = new Scanner(System.in);

int row1,col1,row2, col2;

System.out.println("Enter First Matrix Size Row & column");

row1 = sc.nextInt();

col1 = sc.nextInt();
```

```
System.out.println("Enter Second Matrix Size Row & column");
row2 = sc.nextInt();
col2 = sc.nextInt();
```

```
int[][] A = new int[row1][col1];
int[][] B = new int[row2][col2];
```

```
System.out.println("Enter First Matrix Element Row Wise : ");
for(int i=0;i<row1;i++)
{
    for(int j=0;j<col1;j++)
    {
        A[i][j] = sc.nextInt();
    }
}
System.out.println("Enter Second Matrix Element Row wise : ");
for(int i=0;i<row2;i++)
{
    for(int j=0;j<col2;j++)
    {
        B[i][j] = sc.nextInt();
    }
}
//printMatrix(A,row1,col1);
```

```
//printMatrix(B,row2,col2);

System.out.println();
if(row1 == col1 && row2 == col2)
{
    summationMatrix(A,B,row1,col1);
    substractionMatrix(A,B,row1,col1);
    System.out.println("Matrix multiplication is not possible bcoz
its a Square matrix");
}
else
{
    System.out.println("Addtion matrix and substraction of matrix
Requires Square Matrix ");
    if(row2 == col1)
        matrixMulti(A,B,row1,row2,col2);
    else
        System.out.println("Matrix multiplication is not possible");
}
}
```

```
C:\Windows\System32\cmd.exe
D:\MCA\java\assignment>javac 04_Rajadip_Assignment2.java
D:\MCA\java\assignment>java p3
Enter First Matrix Size Row & column
2
2
Enter Second Matrix Size Row & column
2
2
Enter First Matrix Element Row Wise :
1
2
3
4
Enter Second Matrix Element Row wise :
5
6
7
8

Matrix Addition A+B :
Matrix :-
8 10
10 12
Matrix Subtraction A-B :
Matrix :-
-4 -4
-4 -4
Matrix multiplication is not possible bcoz its a Square matrix
D:\MCA\java\assignment>
```

---

```
/*
```

4) Write and run a JAVA program that reads a string from the user and perform the following.

- counts number of occurrence of a given character (for example, " a") in a string.
- searches the last occurrence of a character in a string.
- removes the unnecessary spaces from a string : leading and trailing spaces.
- displays the substring formed by the last ten characters of a string

```
*/
```

```
class p4
```

```
{
```

```
    public static void main(String[] args)
```

```
{  
    Scanner sc = new Scanner(System.in);  
    System.out.println("Enter String : ");  
    String str;  
    str = sc.nextLine();  
    char key;  
    System.out.println("Enter key char for searching : ");  
    key = sc.next().charAt(0);  
    //System.out.println(str);  
    char[] ch = str.toCharArray();  
    int count=0;  
    for(char i: ch)  
    {  
        if(i == key)  
        {  
            count++;  
        }  
    }  
    System.out.println(key + " number of Occurance is : " +  
count);  
  
    //searches last occurrence of char in string  
    System.out.println("last char = " + str.charAt(str.length()- 1));
```

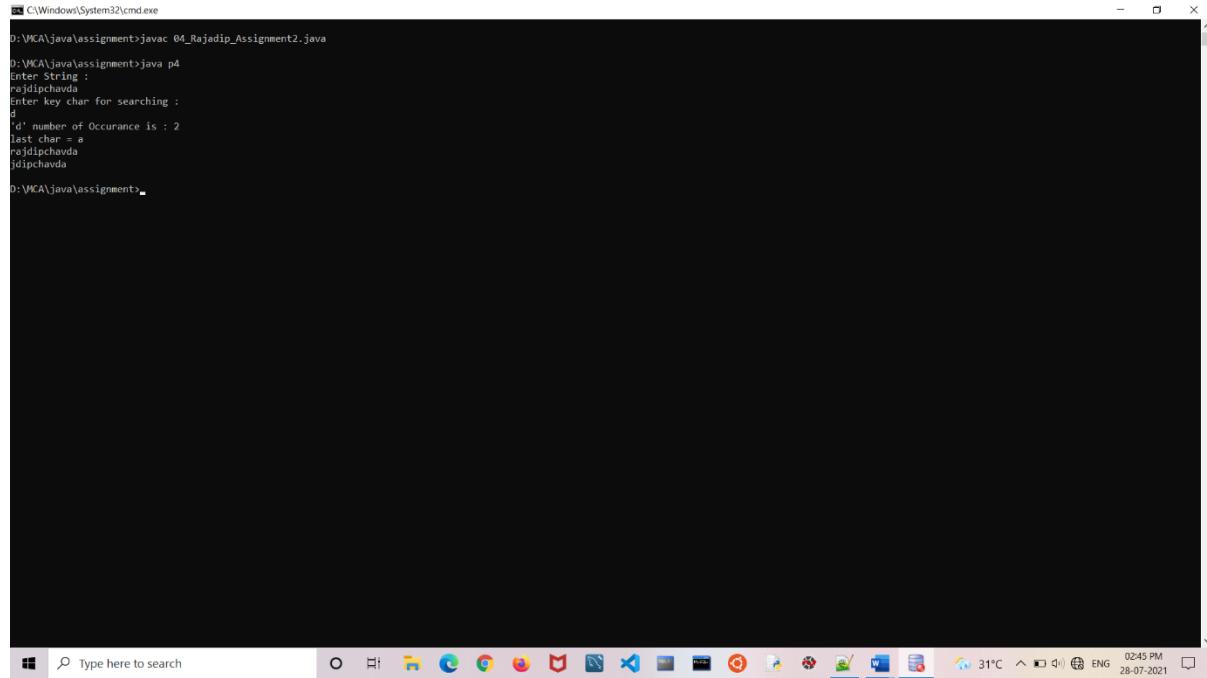
```
//remove extra space from string  
System.out.println(str.replaceAll("\\s+"," ").trim());
```

```
//substring  
String last10Digit = " ";  
last10Digit = str.substring(str.length() - 10);
```

```
System.out.println(last10Digit);
```

```
}
```

```
}
```



C:\Windows\System32\cmd.exe  
D:\VCA\java\assignment>javac 04\_Rajadip\_Assignment2.java  
D:\VCA\java\assignment>java p4  
Enter String :  
rajadipchavda  
Enter key char for searching :  
d  
'd' number of Occurrence is : 2  
last char = a  
rajadipchavda  
jadipchavda  
D:\VCA\java\assignment>

The screenshot shows a Windows command prompt window titled 'cmd.exe'. The command 'javac 04\_Rajadip\_Assignment2.java' is run, followed by 'java p4'. The user enters the string 'rajadipchavda' and the search character 'd'. The output indicates that the character 'd' appears 2 times in the string, and the last occurrence of 'd' is at index 1.

---

```
/*
```

5) WAP that inputs a line of text, tokenizes the line with StringTokenizer and outputs the tokens in reverse order.

```
*/
```

```
class p5
{
    public static void main(String[] args)
    {
        Scanner sc =new Scanner(System.in);

        String str;
        str = sc.nextLine();

        System.out.println("Original String : "+ str);

        StringTokenizer st = new StringTokenizer(str);
        String strRev= " ";
        while(st.hasMoreTokens())
        {
            strRev = st.nextToken() + " " + strRev;
        }

        System.out.println("Reverse String : " + strRev);
    }
}
```

```
}
```

```
}
```

A screenshot of a Windows Command Prompt window titled 'C:\Windows\System32\cmd.exe'. The command 'javac 04\_Rajadip\_Assignment2.java' is run, followed by 'java p5' with argument 'rajadip chavda'. The output shows the original string 'rajadip chavda' and its reverse 'chavda rajadip'. The window has a dark background and a light gray border. The taskbar at the bottom shows various pinned icons and the date/time '28-07-2021 02:48 PM'.

```
C:\Windows\System32\cmd.exe
D:\MCA\java\assignment>javac 04_Rajadip_Assignment2.java
D:\MCA\java\assignment>java p5
rajadip chavda
Original String : rajadip chavda
Reverse String : chavda rajadip
D:\MCA\java\assignment>
```

---

```
/*
```

6) Create a StringBuffer and illustrate how to append character.  
Display capacity, length of the StringBuffer.

```
*/
```

```
class p6
{
    public static void main(String[] args)
    {
        Scanner sc = new Scanner(System.in);
        String str = " ";
```

```
str = sc.nextLine();

StringBuffer sb = new StringBuffer(str);

System.out.println("Enter character You want to append : ");

char newStr = sc.next().charAt(0);

sb.append(newStr);

System.out.println(sb);

System.out.println(sb.capacity());

System.out.println("Length of string : "+sb.length());

}

}
```

```
C:\Windows\System32\cmd.exe
D:\VCA\java\assignment>javac 04_Rajadip_Assignment2.java
D:\VCA\java\assignment>java p6
rajadip_chavda
Enter character You want to append :
d
rajadip_chavdad
29
Length of string : 14
D:\VCA\java\assignment>
```

---

```
/*
7) Write an application that reads and processes strings from the
console. Perform the following functions based on the menu choice
selected by the user..
- Reverse the sequence of strings and then display it.
- Reverse the sequence of characters in each string and then display
it.
- rearrange the strings according to the length of the string.
- Sorting
- Concatenation
- Change them to uppercase, lowercase depending on user's choice.
*/
```

```
class p7
{
    static Scanner sc =new Scanner(System.in);

    static void reverseSeqOfString(String str)
    {
        String s[] = str.split(" ");
        String seqStr = " ";

        for(int i=s.length-1;i>=0;i--)
            seqStr += s[i] + " ";
    }
}
```

```
        System.out.println("Reverse the sequence of strings\n" + seqStr
+ "\n");
    }

    static void reverseSeqOfCharEachString(String str)
    {

        String s[] = str.split(" ");
        String seqStr = " ";
        String tmp;
        for(String w:s)
        {
            StringBuilder sb=new StringBuilder(w);
            sb.reverse();
            seqStr += sb.toString() + " ";
        }
        System.out.println("Reverse the sequence of character of each
strings\n" + seqStr+"\n");
    }

    static void rearrangeString(String str)
    {
        String[] ch = str.split(" ");
        /* for(int i=1;i < ch.length;i++)
        {

```

```
String temp = ch[i];
int j = i-1;
while( j >= 0 && temp.length() < ch[j].length() )
{
    ch[j+1] = ch[j];
    j--;
}
ch[j+1] = temp;
}/*
System.out.println(ch.toString());
System.out.println("Rearrange String : "+str);
}

static void sortingString(String str)
{
    char sortStr[] = str.toCharArray();
    Arrays.sort(sortStr);
    System.out.println(sortStr);
}

static void ConcatenationString(String str)
{
    String newStr = " ";
    System.out.println("Enter string u want to append");
    newStr = sc.nextLine();
    String concateStr = str.concat(newStr);
```

```
        System.out.println(concatenatedString);

    }

    static void uppercaseString(String str)
    {
        System.out.println("UpperCase : "+str.toUpperCase());
    }

    static void lowercaseString(String str)
    {
        System.out.println("LowerCase "+str.toLowerCase());
    }

public static void main(String[] args)
{
    System.out.println("Enter Your String : ");
    String str=sc.nextLine();
    char ch = ' ';
    int choice ;

    do
    {
        System.out.println("1.Reverse the Sequence of string ");
        System.out.println("2.Reverse the sequence of characters in
each string ");
    }
}
```

```
System.out.println("3.rearrange the strings according to the  
length of the string");  
  
System.out.println("4.Sorting");  
  
System.out.println("5.Concatenation");  
  
System.out.println("6.String Convert in UpperCase");  
  
System.out.println("7.String convert in lowerCase");
```

```
choice = sc.nextInt();  
  
switch(choice)  
{  
    case 1:  
        reverseSeqOfString(str);  
        break;  
    case 2:  
        reverseSeqOfCharEachString(str);  
        break;  
    case 3:  
        rearrangeString(str);  
        break;  
    case 4:  
        sortingString(str);  
        break;  
    case 5:  
        ConcatenationString(str);
```

```
        break;

    case 6:
        upperCaseString(str);
        break;

    case 7:
        lowerCaseString(str);;
        break;

    case 8:
        System.exit(0);

    default:
        System.out.println("Enter Valid choice");
    }

System.out.println("\n Do you want to continue? (Press y/n)");
ch = sc.next().charAt(0);

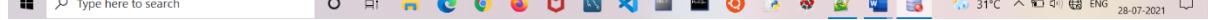
}while(ch == 'y');

}
```

```
C:\Windows\System32\cmd.exe
D:\VKA\Java\assignment>javac 04_Rajadip_Assignment2.java
D:\VKA\Java\assignment>java p7
Enter Your String :
rajadip
1.Reverse the Sequence of string
2.Reverse the sequence of characters in each string
3.rearrange the strings according to the length of the string
4.Sorting
5.Concatenation
6.String Convert in UpperCase
7.String convert in lowerCase
8.
adipjpr

Do you want to continue? (Press y/n)
y
1.Reverse the Sequence of string
2.Reverse the sequence of characters in each string
3.rearrange the strings according to the length of the string
4.Sorting
5.Concatenation
6.String Convert in UpperCase
7.String convert in lowerCase
8.
UpperCase : RAJDIP

Do you want to continue? (Press y/n)
n
D:\VKA\Java\assignment>
```

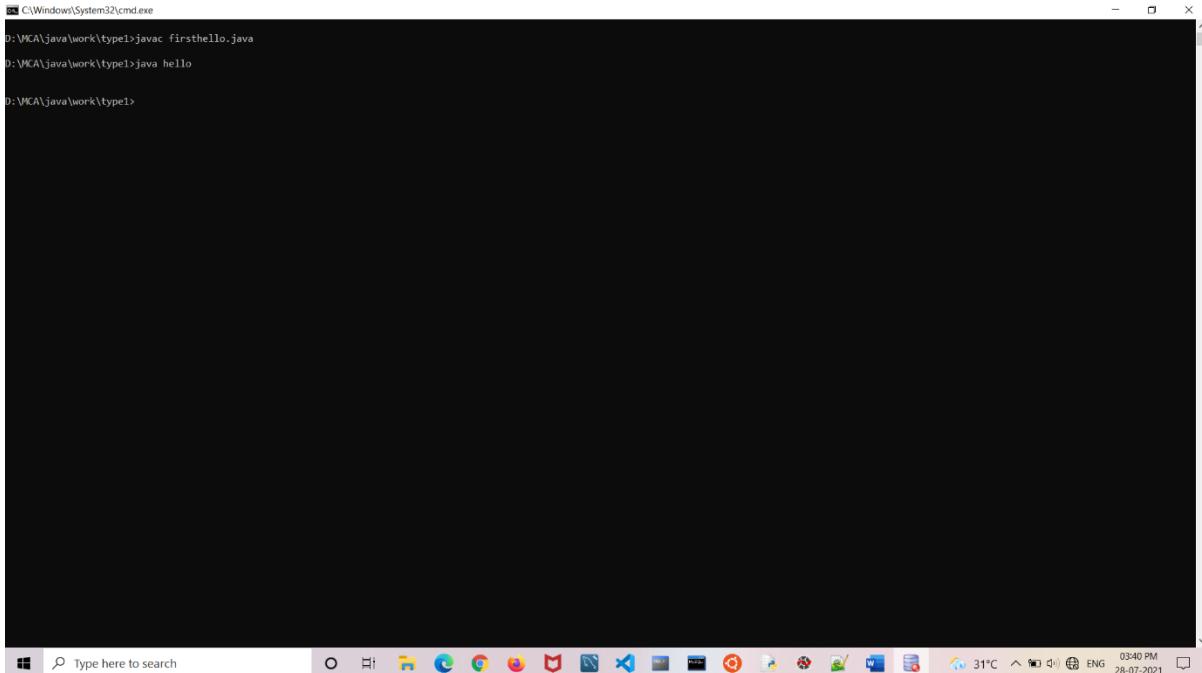


---

## Class Work – Simple Program's

---

```
class hello
{
    public static void main(String args[])
    {
        System.out.println("");
    }
}
```



A screenshot of a Windows command prompt window titled 'C:\Windows\System32\cmd.exe'. The window shows the following command-line session:

```
C:\Windows\System32\cmd.exe
D:\MCA\java\work\type1>javac firsthello.java
D:\MCA\java\work\type1>java hello
D:\MCA\java\work\type1>
```

The window has a dark background and light-colored text. It is positioned over a desktop background featuring a grid of small icons. The taskbar at the bottom of the screen includes icons for various applications like File Explorer, Edge, and Control Panel, along with system status indicators for temperature (31°C), battery level, and network connection.

---

```
class demo1
{
    public static void main(String args[])
}
```

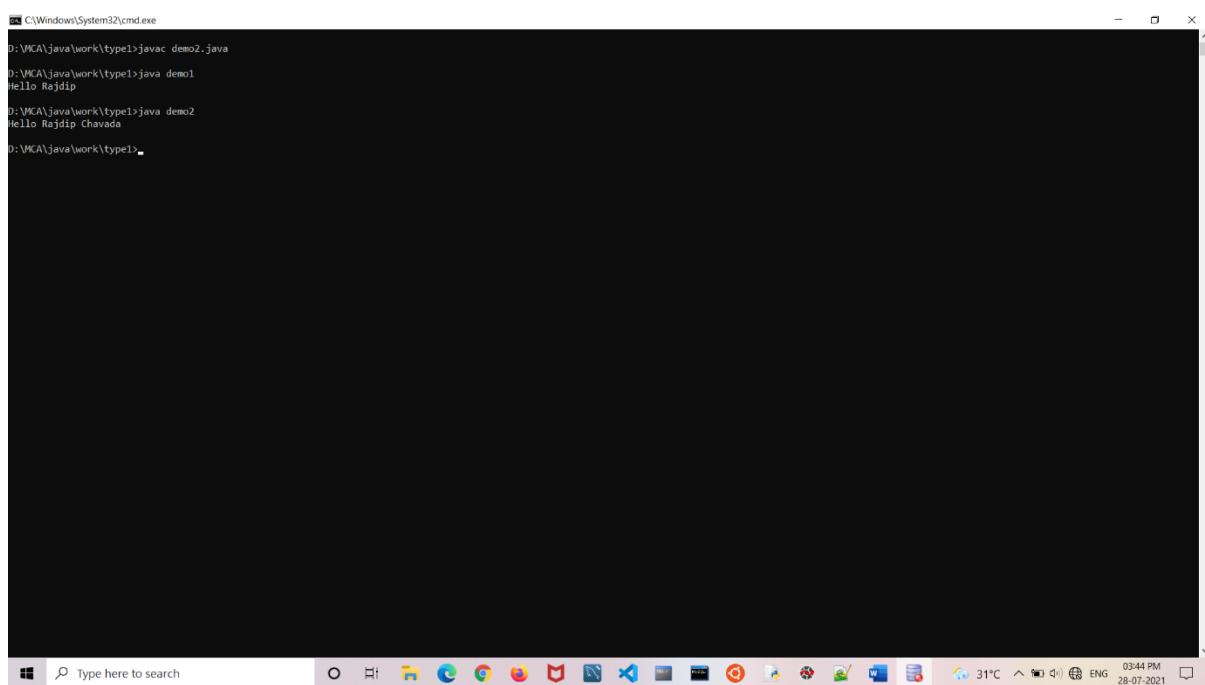
```
{  
    System.out.println("Hello Rajdip"); // simple hello  
<name> program  
}  
}
```

The screenshot shows a Windows Command Prompt window titled 'C:\Windows\System32\cmd.exe'. The command line shows the path 'D:\VCA\java\work\type1\javac demo1.java' followed by 'D:\VCA\java\work\type1\java demo1'. The output 'Hello Rajdip' is displayed. The taskbar at the bottom includes icons for File Explorer, Edge, Google Chrome, and others, along with system status indicators like battery level, temperature (31°C), and date/time (03:42 PM, 28-07-2021).

---

```
class demo1  
{  
    public static void main(String args[])  
    {  
        System.out.println("Hello Rajdip");  
    }  
}  
class demo2 //public class always named as file name
```

```
{  
    public static void main(String args[]){  
        {  
            System.out.println("Hello Rajdip Chavada");  
        }  
    }  
}
```



A screenshot of a Windows Command Prompt window titled 'C:\Windows\System32\cmd.exe'. The window shows the following command-line session:

```
D:\VMCA\java\work\type1>javac demo2.java  
D:\VMCA\java\work\type1>java demo1  
Hello Rajdip  
D:\VMCA\java\work\type1>java demo2  
Hello Rajdip Chavada  
D:\VMCA\java\work\type1>
```

The window has a dark background and light-colored text. The taskbar at the bottom shows various pinned icons and the system tray with the date and time.

---

```
class demo3  
{  
    public static void main(String args[]){  
        {  
            for(String name : args) //concept of jagged array  
            {  
                System.out.println("hello "+name);  
            }  
        }  
    }  
}
```

```
 }  
 }  
 }
```

A screenshot of a Windows command prompt window titled 'C:\Windows\System32\cmd.exe'. The window shows the following command-line session:

```
D:\MCA\java\work\type1>javac demo3.java  
D:\MCA\java\work\type1>java demo3 rajdip  
Hello rajdip  
D:\MCA\java\work\type1>
```

The window has a dark background and light-colored text. The taskbar at the bottom of the screen includes icons for various applications like File Explorer, Edge, and Control Panel, along with system status indicators for temperature (31°C), battery level, and network connection.

---

```
class demo4  
{  
    public static void main(String args[])  
    {  
        char ch='\u0B85';  
        System.out.println(ch);  
    }  
}
```

A screenshot of a Windows Command Prompt window titled 'C:\Windows\System32\cmd.exe'. The command entered is 'D:\VCA\java\work\type1>javac demo4.java' followed by 'D:\VCA\java\work\type1>java demo4'. The window has a dark background and a light-colored text area. At the bottom, there's a taskbar with various icons and system status information like '31°C', 'ENG', and the date '28-07-2021'.

```
D:\VCA\java\work\type1>javac demo4.java
D:\VCA\java\work\type1>java demo4

```

---

```
class demo5
{
    public static void main(String args[])
    {
        int[][] a=new int[10][5];
        a[2]=a[0];
        for(int i=0;i<a.length;i++)
        {
            for(int j=0;j<a[i].length;j++)
            {
                a[i][j]=i+j;
            }
        }
    }
}
```

```
        System.out.println(a[1][4]);  
    }  
}
```

A screenshot of a Windows command prompt window titled 'C:\Windows\System32\cmd.exe'. The window shows the following command-line session:

```
D:\MCA\java\work\type1>javac demo5.java  
D:\MCA\java\work\type1>java demo5  
5
```

The window has a dark background and light-colored text. The taskbar at the bottom shows various application icons, the date (28-07-2021), and the time (03:46 PM). The system tray indicates a temperature of 31°C.

---

```
class demo1  
{  
    public static void main(String args[])  
    {  
        /*System.out.println("there are "+ args.length + "  
command line arguments");  
        System.out.println("there are "+ args[0] + " "+ args[1]);*/  
        for(int i=0;i<args.length;i++)  
            System.out.println(" hello " + args[i]);
```

```
}
```

```
}
```

A screenshot of a Windows command prompt window titled 'C:\Windows\System32\cmd.exe'. The window contains the following text:

```
D:\VCA\java\work\type1>javac demo1.java
D:\VCA\java\work\type1>java demo1 rajdip daxesh
hello rajdip
Hello daxesh
D:\VCA\java\work\type1>
```

The window has a dark background and light-colored text. The taskbar at the bottom shows various pinned icons and the system tray with the date and time (28-07-2021, 03:47 PM).

---

```
class demo2
```

```
{
```

```
    public static void main(String args[])
    {
        char ch;
        ch='x';
        System.out.println("ch contains " + ch);
        ch++;
        System.out.println("ch is now" + ch);
        ch=90;
        ch++;
    }
}
```

```
        System.out.println("ch is now " + ch);  
    }  
}
```

A screenshot of a Windows command prompt window titled 'C:\Windows\System32\cmd.exe'. The window shows the following command and its output:

```
D:\MCA\java\work\type1>javac demo12.java  
D:\MCA\java\work\type1>java demo12  
ch contains x  
ch is now y  
ch is now [
```

The window has a standard Windows title bar and taskbar at the bottom. The taskbar includes icons for various applications like File Explorer, Edge, and File Manager.

---

```
package p1;
```

```
class c1  
{  
    public void m1()  
    {  
        System.out.println("m1 of c1");  
    }  
    public static void main(String args[])  
    {
```

```
c1 obj=new c1();  
obj.m1();  
}  
}
```

The screenshot shows a Windows command prompt window titled 'C:\Windows\System32\cmd.exe'. The command line shows the path 'D:\VCA\java\work\type1>' followed by the command 'javac demo13.java'. The output of the compilation is 'hello rajdip\_chavda'. Below the command prompt is a standard Windows taskbar with various icons for applications like File Explorer, Internet Explorer, and others. The system tray shows the date as 28-07-2021, the time as 03:50 PM, and the temperature as 31°C.

---

```
import java.util.Scanner;  
class hello  
{  
    public static void main(String args[])  
    {  
        System.out.println("hello");  
    }  
}  
class helloname
```

```
{  
    public static void main(String args[])  
    {  
        System.out.print("hello "+args[0]);  
    }  
}  
  
class dynamic  
{  
    public static void main(String args[]){  
        for(String name:args)  
        {  
            System.out.println("hello "+name);  
            System.out.println("hello "+args);  
        }  
    }  
}  
  
class jagged  
{  
    public static void main(String args[]){  
        int p[][]={{1,2,3},{4,5,6},{7,8,9}};  
        for(int i[]:p)  
        {
```

```
        for(int j:i)
        {
            System.out.print(j+" ");
        }
        System.out.println(" ");
    }

}

class loop
{
    public static void main(String args[])
    {
        int i=0;
        for(i=0;i<10;i++)
        {
            System.out.println(i+" ");
        }
        while(i>0)
        {
            System.out.println(i+" ");
            i--;
        }
        do
        {

```

```
System.out.println(i+" ");
i++;
}while(i<=10);
}

}

class switchcase
{
public static void main(String args[])
{
Scanner n1=new Scanner(System.in);
System.out.println("Enter value to you have to print :");
int n=n1.nextInt();

if(n<=5)
{
switch(n)
{
case 1:
System.out.println("--> 1");
break;
case 2:
System.out.println("--> 2");
break;
}
}
}
```

```
        case 3:  
            System.out.println("--> 3");  
            break;  
  
        case 4:  
            System.out.println("--> 4");  
            break;  
  
        case 5:  
            System.out.println("--> 5");  
            break;  
    }  
}  
  
}  
  
class tryinitialization  
{  
    static int value[] = new int[10];  
  
    static  
    {  
        System.out.println("running.....");  
        for(int i=0;i<value.length;i++)  
        {  
            value[i]=(int)(100.0*Math.random());  
        }  
    }  
}
```

```
    }

}

void list()
{
    System.out.println();
    for(int nvalue:value)
    {
        System.out.print(" "+nvalue);
    }
    System.out.println();
}

public static void main(String[] args)
{
    tryinitialization example = new tryinitialization();
    System.out.println("\nFirst object:");
    example.list();
    tryinitialization nextexample = new tryinitialization();
    System.out.println("\nSecond object:");
    nextexample.list();

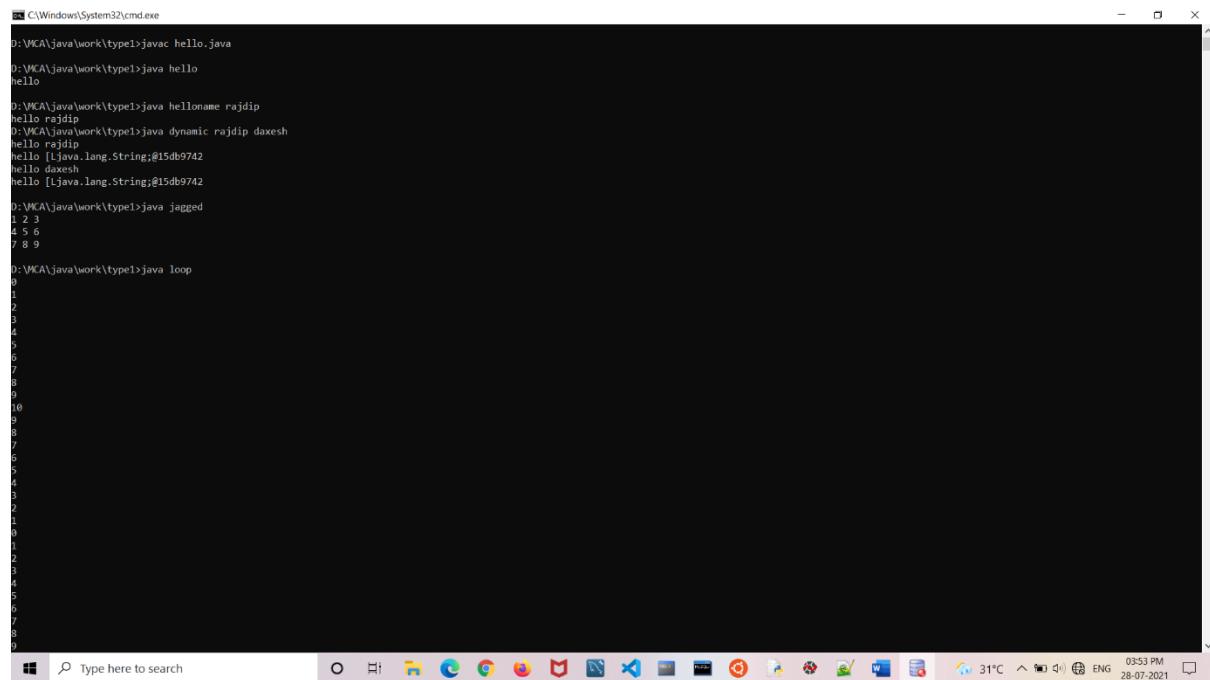
}

class some
```

```

{
    public static void main(String args[])
    {
        Rectangle rect;
        rect.width=40;
    }
}

```



The screenshot shows a Windows Command Prompt window titled 'C:\Windows\System32\cmd.exe'. The command line path is 'D:\VKA\java\work\type1>'. The user has run several Java programs:

- hello.java**: Prints 'Hello Rajdip'.
- dynamic**: Prints 'Hello Rajdip' and 'Hello Daxesh'.
- jagged**: Prints a 3x3 jagged matrix of integers: [[1, 2, 3], [4, 5, 6], [7, 8, 9]].
- loop**: Prints a 10x10 loop matrix of integers from 0 to 9.

The taskbar at the bottom shows various application icons, and the system tray indicates the date and time as 28-07-2021 03:53 PM.

The screenshot shows a Windows command prompt window titled 'C:\Windows\System32\cmd.exe'. The command 'D:\VMCA\java\work\type1>java switchcase' is run, followed by 'Enter value to you have to print : 2' and the output '2 -> 2'. Then, 'D:\VMCA\java\work\type1>java tryinitialization' is run, followed by 'running.....'. The output then shows two sets of values: 'First object:' and 'Second object:', both displaying the same sequence of numbers: 58 82 17 90 78 10 65 62 71 42. The command prompt ends with 'D:\VMCA\java\work\type1>'. Below the command prompt is the Windows taskbar with various pinned icons and system status information.

```
D:\VMCA\java\work\type1>java switchcase
Enter value to you have to print :
2 -> 2
D:\VMCA\java\work\type1>java tryinitialization
running.....First object:
58 82 17 90 78 10 65 62 71 42
Second object:
58 82 17 90 78 10 65 62 71 42
D:\VMCA\java\work\type1>
```

---

```
/*use the pythagorean theorem to
find the length of the hypotenuse
given the lengths of the two opposing sides.
```

```
*/
class Hypot{
    public static void main(String args[])
    {
        double x,y,z;
        x=3;
        y=4;
        z=java.lang.Math.sqrt(x*x + y*y);
```

```
System.out.println("hypotenuse is :" + z );
```

```
}
```

```
}
```

A screenshot of a Windows command prompt window titled 'C:\Windows\System32\cmd.exe'. The window contains the following text:

```
D:\VCA\java\work\type1>javac Hypot.java
D:\VCA\java\work\type1>java Hypot
hypotenuse is :5.0
D:\VCA\java\work\type1>
```

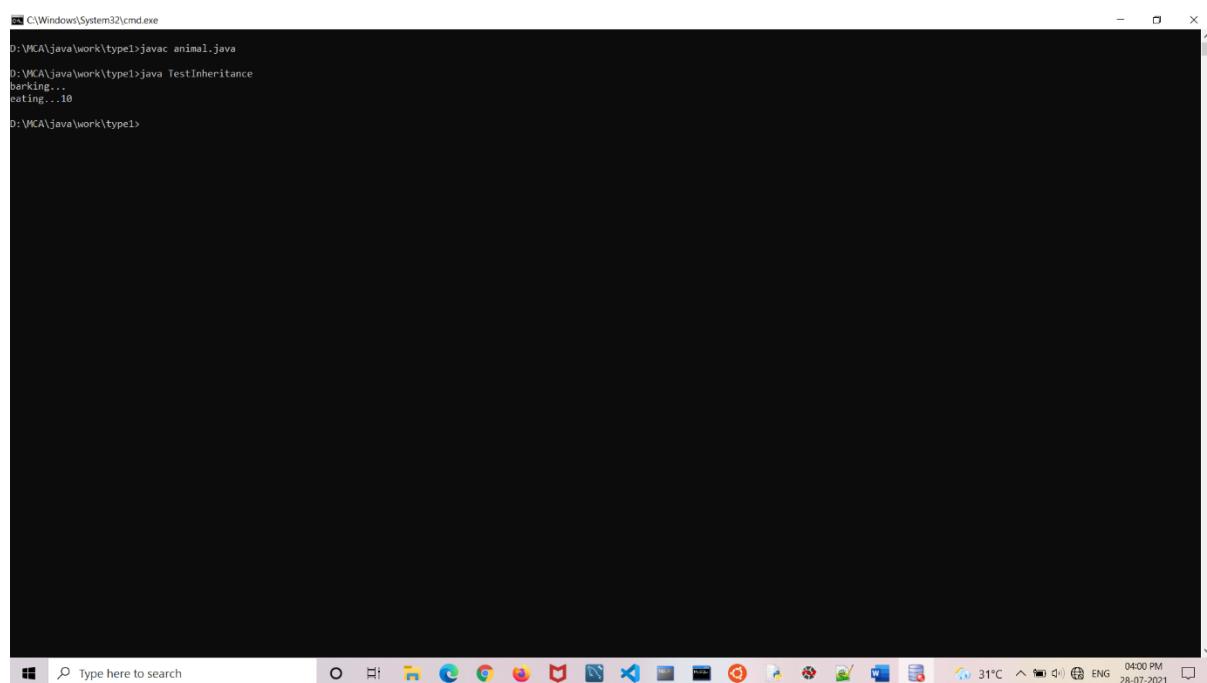
The window has a dark background and light-colored text. The title bar and taskbar are visible at the bottom, showing various icons and system status.

---

```
class Animal
{
    int a=10;
    void eat()
    {
        System.out.println("eating..."+a);
    }
}

class Dog extends Animal{
    void bark(){System.out.println("barking...");}
}
```

```
class TestInheritance{  
    public static void main(String args[]){  
        Dog d=new Dog();  
        d.bark();  
        d.eat();  
    }  
}
```



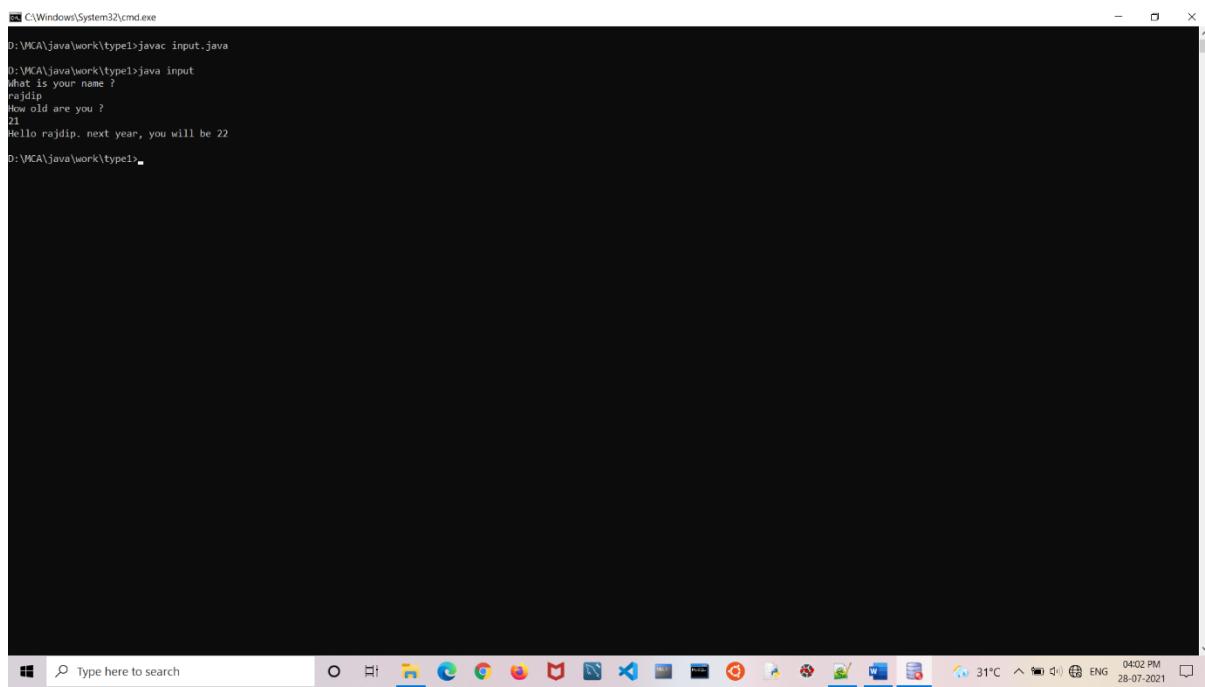
---

```
import java.util.Scanner;  
public class input  
{  
    public static void main(String args[])  
    {  
        Scanner in=new Scanner(System.in);
```

```
System.out.println("What is your name ? ");
String name=in.nextLine();
System.out.println("How old are you ? ");
int age=in.nextInt();

System.out.println("Hello "+name+". next year, you will
be "+(age+1));
}

}
```



A screenshot of a Windows Command Prompt window titled 'C:\Windows\System32\cmd.exe'. The window shows the following interaction:

```
D:\MCA\java\work\type1>javac input.java
D:\MCA\java\work\type1>java input
what is your name ?
rajdip
how old are you ?
21
Hello rajdip. next year, you will be 22
D:\MCA\java\work\type1>
```

The window has a dark background and light-colored text. The taskbar at the bottom shows various pinned icons and the system tray with the date and time.

---

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

```
        System.out.println(" +\"\\\"\\\"\\\"+");
        System.out.println("[| o o |]");
        System.out.println(" | ^ | ");
        System.out.println(" | - | ");
        System.out.println(" +---+ ");
    }

}

class buffelo
{
    public static void main(String args[])
    {
        System.out.println(" , , , ");
        System.out.println(" / \\" );
        System.out.println(" (( __---,,---__))");
        System.out.println(" (_ ) O O (_ )_____");
        System.out.println(" \\<_ / |\\\" );
        System.out.println(" o_o \\ B F L O | \\\" );
        System.out.println(" \\<_ _____ | *");
        System.out.println(" ||| WW||| ");
        System.out.println(" ||| ||| ");
    }

}
```

D:\VCA\java\work\type1>javac face.java  
D:\VCA\java\work\type1>java face  
o o [ ]  
| ^ |  
| . . |  
+----+  
D:\VCA\java\work\type1>javac buffalo.java  
D:\VCA\java\work\type1>java buffalo  
( ( \_ ) \_ )  
\\ o\_o / B F L O  
| | | | M | | | \*  
D:\VCA\java\work\type1>

---

```
class help
```

```
{
```

```
    public static void main(String args[])
```

```
        throws java.io.IOException
```

```
{
```

```
    char choice,ignore;
```

```
    do
```

```
{
```

```
        System.out.println(" HELP : ");
```

```
        System.out.println(" 1 : IF ");
```

```
        System.out.println(" 2 : SWITCH ");
```

```
        System.out.println(" 3 : FOR ");
```

```
        System.out.println(" 4 : WHILE ");
```

```
System.out.println(" 5 : DO WHILE ");
System.out.println(" 6 : BREAK ");
System.out.println(" 7 : CONTINUE ");
System.out.println(" 0 : EXIT... ");

System.out.println("\n Enter your choice : ");
choice=(char)System.in.read();

do
{
    ignore=(char)System.in.read();

}while(ignore!='\n');

if(choice!='0')

{
    System.out.println("\n.....Enter only
Menu Options.....\n");

}
else
{
    System.out.println("\n .....Exit.....");

}

}while(choice!='0' & choice<='0'|choice>='8');

switch(choice)
{
```

```
case '1':  
    System.out.println("THe If :\n");  
    System.out.println("if(condition)  
statement;");  
    System.out.println("else statement;");  
    break;  
  
case '2':  
    System.out.println("The Switch :\n");  
    System.out.println("switch(expression)  
{");  
    System.out.println("    case condition:");  
    System.out.println("        statement  
sequence");  
    System.out.println("        break;");  
    System.out.println("    // ...");  
    System.out.println("}");  
    break;  
  
case '3':  
    System.out.println("The For :\n");  
  
    System.out.println("for(init;condition;iteration)");  
    System.out.println("    statement;");  
    break;  
  
case '4':  
    System.out.println("The While :\n");
```

```
        System.out.println("while(condition)
statement;");

        break;

    case '5':

        System.out.println("The do-while :\n");
        System.out.println("do {");
        System.out.println(" statement");
        System.out.println("} while (condition);");
        break;

    case '6':

        System.out.println("The break :\n");
        System.out.println("break; or break label
;");

        break;

    case '7':

        System.out.println("The continue :\n");
        System.out.println("continue; or
continue label;");

        break;

    case '0':

        break;
    }

    System.out.println();

}

}
```

```
C:\Windows\System32\cmd.exe
D:\VCA\java\work\type1>javac help.java
D:\VCA\java\work\type1>java help
HELP :
1 : IF
2 : SWITCH
3 : FOR
4 : WHILE
5 : DO WHILE
6 : BREAK
7 : CONTINUE
0 : EXIT...
Enter your choice :
1
.....Enter only Menu Options.....
The If :
if(condition) statement;
else statement;

D:\VCA\java\work\type1>javac help.java
D:\VCA\java\work\type1>java help
HELP :
1 : IF
2 : SWITCH
3 : FOR
4 : WHILE
5 : DO WHILE
6 : BREAK
7 : CONTINUE
0 : EXIT...
Enter your choice :
2
.....Enter only Menu Options.....
The Switch :
switch(expression) {
    case condition:
        statement sequence
        break;
    // ...

```

---

## Class Work – Arrays and sorting and Oprations

---

```
class array
{
    public static void main(String args[])
    {
        int a[]={10,20,30,40,50};
        int b;
        for(int i=0;i<a.length;i++)
        {
            for(int j=i+1;j<a.length;j++)
            {
                if(a[j]<a[i])
                {
                    b=a[j];
                    a[j]=a[i];
                    a[i]=b;
                }
            }
        }
        for(int i=0;i<a.length;i++)
        {
    }
```

```
        System.out.println("array :" + a[i]);  
    }  
}  
}
```

```
C:\Windows\System32\cmd.exe  
D:\VICA\java\work\type2>javac array.java  
D:\VICA\java\work\type2>java array  
array :10  
array :20  
array :30  
array :40  
array :50  
D:\VICA\java\work\type2>
```

---

```
class ArrayCopyDemo
```

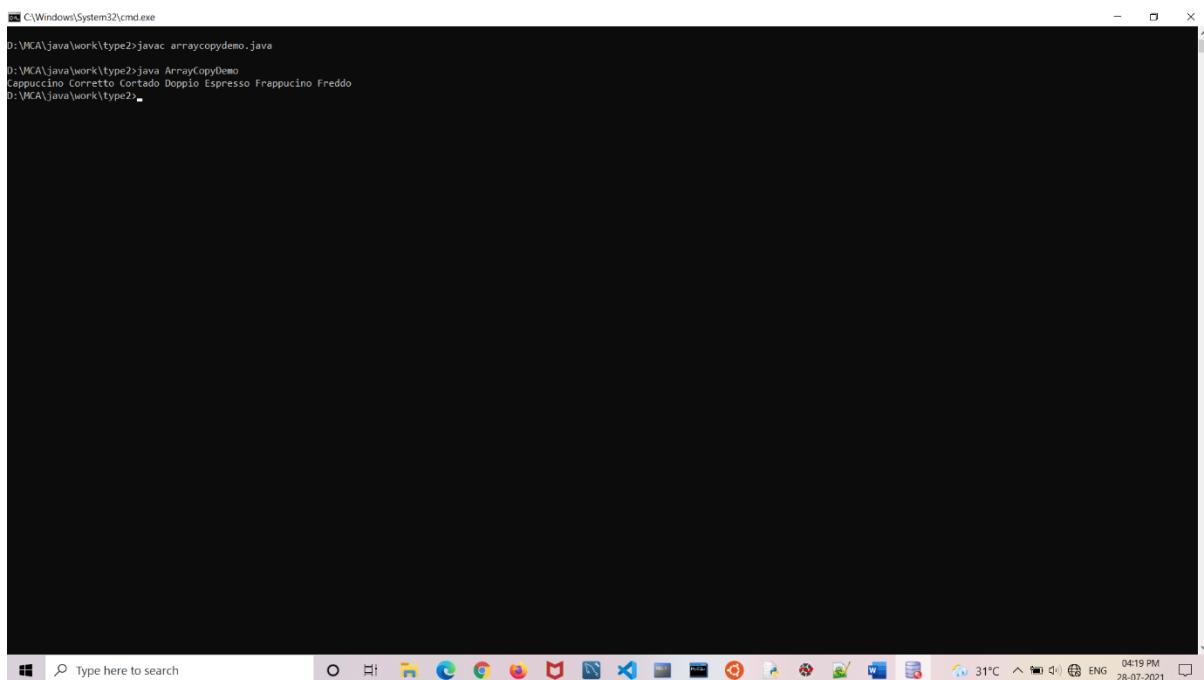
```
{  
    public static void main(String[] args)  
    {  
        String[] copyFrom = {  
            "Affogato", "Americano", "Cappuccino", "Corretto",  
            "Cortado",  
            "Doppio", "Espresso", "Frappucino", "Freddo", "Lungo",  
            "Macchiato",  
        };  
        String[] copyTo = new String[copyFrom.length];  
        System.arraycopy(copyFrom, 0, copyTo, 0, copyFrom.length);  
        for (String s : copyTo) {  
            System.out.println(s);  
        }  
    }  
}
```

```

    "Marocchino", "Ristretto" };

String[] copyTo = new String[7];
System.arraycopy(copyFrom, 2, copyTo, 0, 7);
for (String coffee : copyTo)
{
    System.out.print(coffee + " ");
}
}

```




---

```

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

```

```
{  
String[] copyFrom = {  
    "Affogato", "Americano", "Cappuccino", "Corretto",  
    "Cortado",  
    "Doppio", "Espresso", "Frappucino", "Freddo", "Lungo",  
    "Macchiato",  
    "Marocchino", "Ristretto" };
```

```
String[] copyTo = new String[7];  
System.arraycopy(copyFrom, 2, copyTo, 0, 7);  
for (String coffee : copyTo)  
{  
    System.out.print(coffee + " ");  
}  
}
```

```
C:\Windows\System32\cmd.exe  
D:\VCA\java\work\type2>javac arraycopyofdemo.java  
D:\VCA\java\work\type2>java arraycopyofdemo  
Cappuccino Corretto Cortado Doppio Espresso Frappucino Freddo  
D:\VCA\java\work\type2>
```

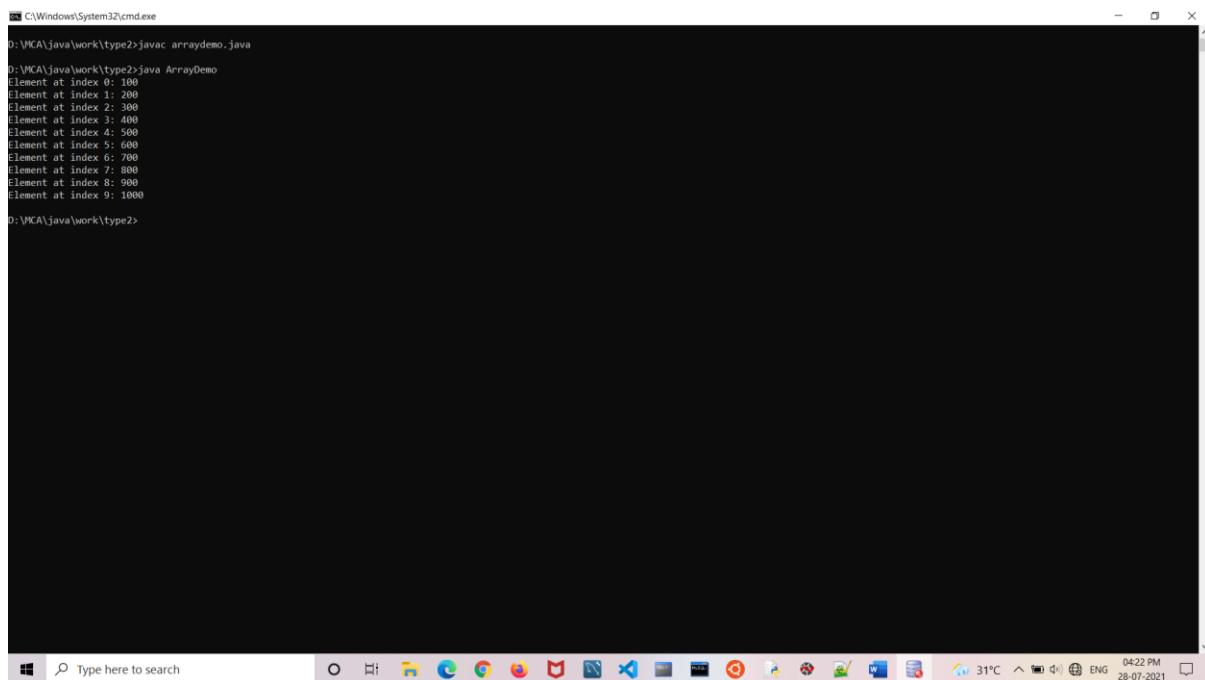
---

```
class ArrayDemo
{
    public static void main(String[] args)
    {
        // declares an array of integers
        int[] anArray;

        // allocates memory for 10 integers
        anArray = new int[10];

        // initialize first element
        anArray[0] = 100;
        // initialize second element
        anArray[1] = 200;
        // and so forth
        anArray[2] = 300;
        anArray[3] = 400;
        anArray[4] = 500;
        anArray[5] = 600;
        anArray[6] = 700;
        anArray[7] = 800;
        anArray[8] = 900;
        anArray[9] = 1000;
```

```
System.out.println("Element at index 0: "+ anArray[0]);  
System.out.println("Element at index 1: "+ anArray[1]);  
System.out.println("Element at index 2: "+ anArray[2]);  
System.out.println("Element at index 3: "+ anArray[3]);  
System.out.println("Element at index 4: "+ anArray[4]);  
System.out.println("Element at index 5: "+ anArray[5]);  
System.out.println("Element at index 6: "+ anArray[6]);  
System.out.println("Element at index 7: "+ anArray[7]);  
System.out.println("Element at index 8: "+ anArray[8]);  
System.out.println("Element at index 9: "+ anArray[9]);  
}  
}
```



```
C:\Windows\System32\cmd.exe  
D:\VICA\java\work\type2>javac arraydemo.java  
D:\VICA\java\work\type2>java ArrayDemo  
Element at index 0: 100  
Element at index 1: 200  
Element at index 2: 300  
Element at index 3: 400  
Element at index 4: 500  
Element at index 5: 600  
Element at index 6: 700  
Element at index 7: 800  
Element at index 8: 900  
Element at index 9: 1000  
D:\VICA\java\work\type2>
```

---

```
/*Software Even If advised of the possibility of such Damage*/
public class ArrayofarrayDemo2{
    public static void main(String args[])
    {
        int[][] amatrix=new int[4][];
        //populate matrix
        for(int i=0;i<amatrix.length;i++)
        {
            amatrix[i] =new int[5];//Create sub-array
            for(int j=0;j<amatrix[i].length;j++)
            {
                amatrix[i][j] =i + j;
            }
        }
        //print matrix
        for(int i=0;i<amatrix.length;i++)
        {
            for(int j=0;j<amatrix[i].length;j++)
            {
                System.out.print(amatrix[i][j] + " ");
            }
            System.out.println();
        }
    }
}
```

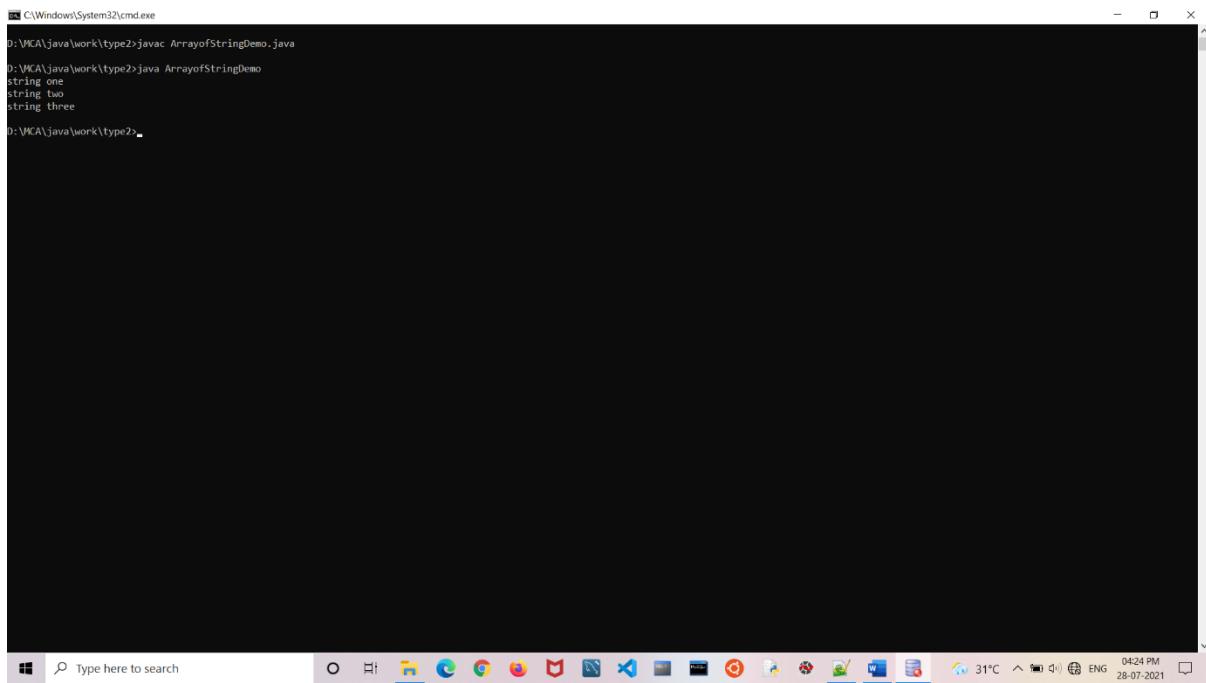
```
}
```

```
}
```

A screenshot of a Windows command prompt window titled 'C:\Windows\System32\cmd.exe'. The window shows the following text:  
D:\VCA\java\work\type2>javac ArrayofarrayDemo2.java  
D:\VCA\java\work\type2>java ArrayofarrayDemo2  
0 1 2 3 4  
1 2 3 4 5  
2 3 4 5 6  
3 4 5 6 7  
D:\VCA\java\work\type2>

---

```
public class ArrayOfStringDemo{  
    public static void main(String args[]){  
        {  
            String[] anArray={"String one","String two","String Three"};  
            for(String S:anArray)  
            {  
                System.out.println(S.toLowerCase());  
            }  
        }  
    }  
}
```



A screenshot of a Windows Command Prompt window titled 'C:\Windows\System32\cmd.exe'. The command 'javac ArrayOfStringDemo.java' is run, followed by 'java ArrayOfStringDemo', which outputs 'string one', 'string two', and 'string three'. The window has a standard Windows title bar and taskbar at the bottom.

```
D:\VMCA\java\work\type2>javac ArrayOfStringDemo.java
D:\VMCA\java\work\type2>java ArrayOfStringDemo
string one
string two
string three
D:\VMCA\java\work\type2>
```

---

```
class barrel_litter
{
    public static void main(String args[])
    {
        int barrel=5;
        int litter=barrel*159;
        System.out.println("litter :" +litter);
    }
}
```

C:\Windows\System32\cmd.exe  
D:\MCA\java\work\type2>javac barrel\_litter.java  
D:\MCA\java\work\type2>java barrel\_litter  
litter :795  
D:\MCA\java\work\type2>

The screenshot shows a Windows command prompt window titled 'C:\Windows\System32\cmd.exe'. The command 'javac barrel\_litter.java' is run, followed by 'java barrel\_litter', which outputs 'litter :795'. The window has a dark background and a light-colored title bar.

---

```
class Bicycle
{
    public int cadence=0;
    int speed=0;
    int gear=1;

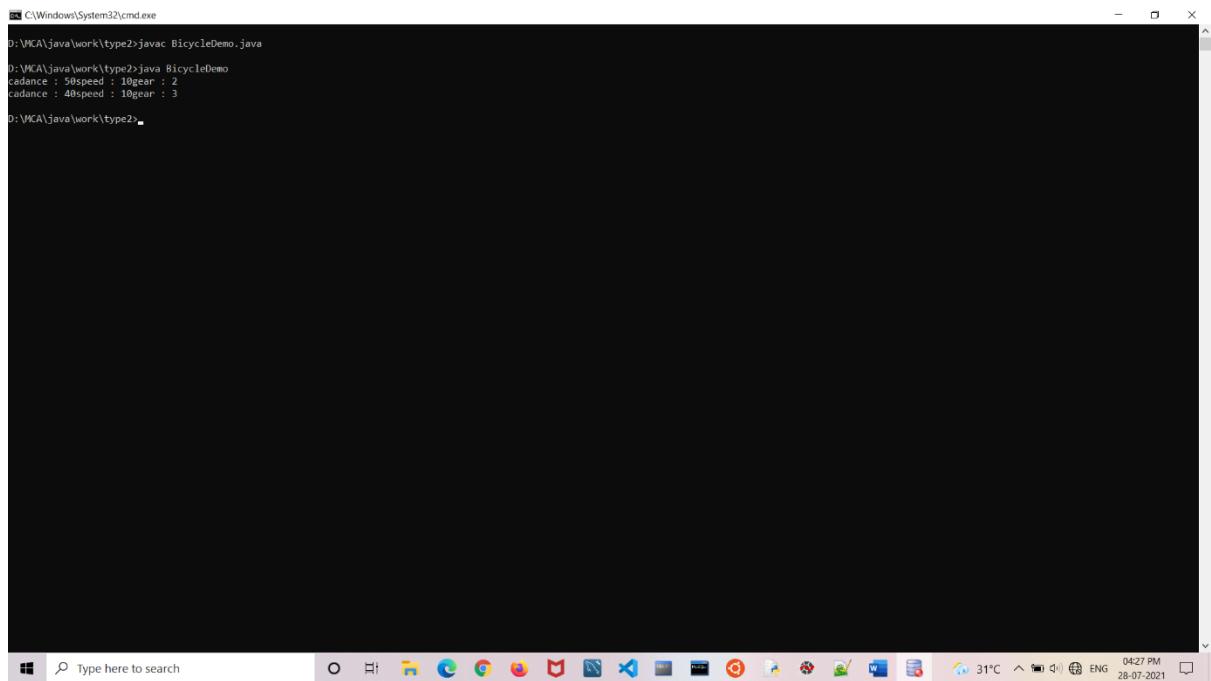
    void changeCadence(int newValue)
    {
        cadence = newValue;
    }

    void changeGear(int newValue)
    {
```

```
        gear = newValue;  
    }  
  
    void speedUp(int increment)  
    {  
        speed = speed+increment;  
    }  
  
    void applyBrakes(int decrement)  
    {  
        speed = speed-decrement;  
    }  
  
    void printStates()  
    {  
        System.out.println("cadance : " + cadence + "speed : " +  
                           speed + "gear : " + gear);  
    }  
  
class BicycleDemo  
{  
    public static void main(String args[])
```

```
{  
    Bicycle bike1= new Bicycle();  
    Bicycle bike2 = new Bicycle();  
  
    bike1.changeCadence(50);  
    bike1.speedUp(10);  
    bike1.changeGear(2);  
    bike1.printStates();  
  
    bike2.changeCadence(50);  
    bike2.speedUp(10);  
    bike2.changeGear(2);  
    bike2.changeCadence(40);  
    bike2.changeGear(3);  
    bike2.printStates();  
}
```

}



C:\Windows\System32\cmd.exe

```
D:\VCA\java\work\type2>javac BicycleDemo.java
D:\VCA\java\work\type2>java BicycleDemo
cadance : 50speed : 10gear : 2
cadance : 40speed : 10gear : 3
D:\VCA\java\work\type2>
```

Type here to search    31°C  ENG  04:27 PM  28-07-2021

---

```
public class bitwise_shift
{
    public static void main(String args[])
    {
        int n1=8;
        int n2=-10;
        System.out.println("n1<<2= "+(n1<<2));
        System.out.println("n2>>2= "+(n2>>2));
        System.out.println("n1>>>2= "+(n1>>>2));
    }
}
```

C:\Windows\System32\cmd.exe  
D:\VMCA\java\work\type2>javac bitwise\_shift.java  
D:\VMCA\java\work\type2>java bitwise\_shift  
n1<n2= 32  
n2>n2= 3  
n1>>>n1= 2  
D:\VMCA\java\work\type2>

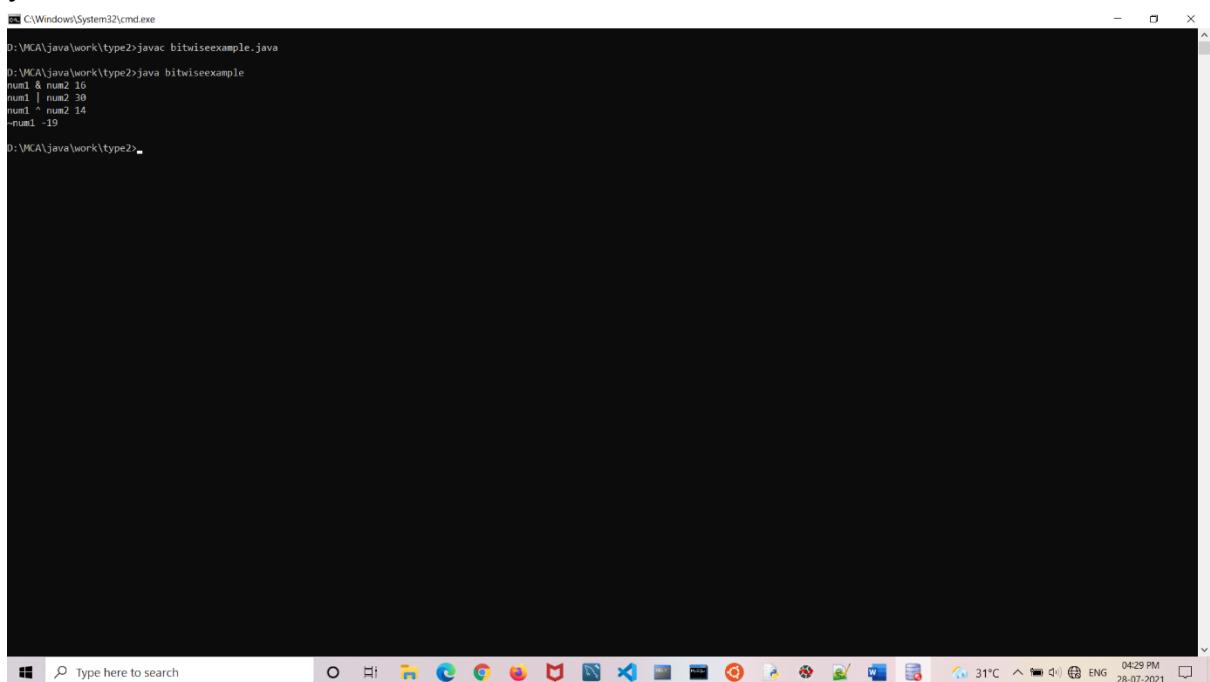
---

```
public class bitwiseexample
```

```
{
```

```
    public static void main(String args[])
    {
        int n1=18,n2=28,n3=0;
        System.out.println("num1 & num2 "+(n1&n2));
        System.out.println("num1 | num2 "+(n1|n2));
        System.out.println("num1 ^ num2 "+(n1^n2));
        System.out.println("~num1 "+~n1);
    }
}
```

```
}
```



A screenshot of a Windows command prompt window titled 'C:\Windows\System32\cmd.exe'. The window contains the following text:

```
D:\MCA\java\work\type2>javac bitwiseexample.java
D:\MCA\java\work\type2>java bitwiseexample
num1 & num2 16
num1 | num2 30
num1 ^ num2 14
~num1 -19
D:\MCA\java\work\type2>
```

The window has a dark background and a light-colored text area. The title bar and taskbar are visible at the bottom, showing various icons and system status.

---

```
class bubble
```

```
{
```

```
    public static void main(String args[])
    {
        int nums[]={99,-10,100123,18,-978,5623,463,-9,287,49};
        int a,b,t;
        int size;
        size=10;
        System.out.print("Original Array is :");
        for(int i=0;i<size;i++)
        {
            System.out.print(" "+nums[i]);
```

```
}

System.out.println();

for(a=1;a<size;a++)
{
    for(b=size-1;b>=a;b--)
    {
        if(nums[b-1]>nums[b])
        {
            t=nums[b-1];
            nums[b-1]=nums[b];
            nums[b]=t;
        }
    }
}

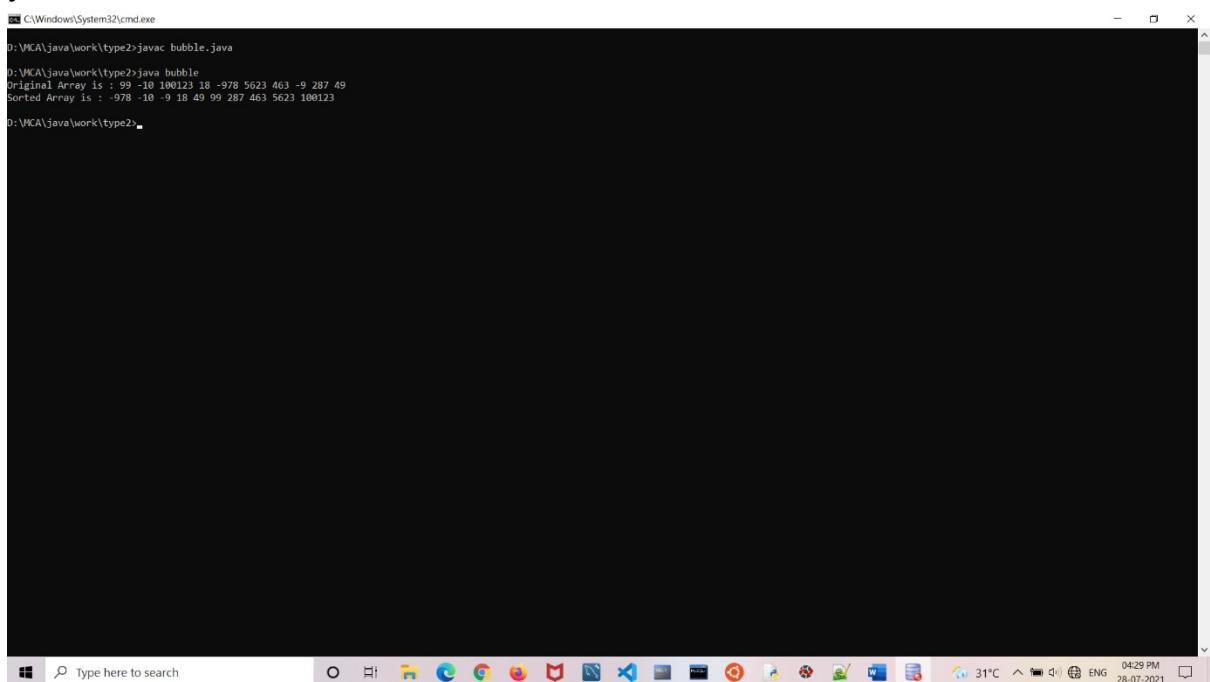
System.out.print("Sorted Array is :");

for(int i=0;i<size;i++)
{
    System.out.print(" "+nums[i]);
}

System.out.println();

}
```

```
}
```



C:\Windows\System32\cmd.exe

```
D:\VMCA\java\work\type2>javac bubble.java
D:\VMCA\java\work\type2>java bubble
Original Array is : 99 -10 100123 18 -978 5623 463 -9 287 49
Sorted Array is : -978 -10 -9 18 49 99 287 463 5623 100123
D:\VMCA\java\work\type2>
```

---

```
class fal
```

```
{
```

```
    public static void main(String args[])
```

```
{
```

```
    double gallons,liters;
```

```
    int counter;
```

```
    counter=0;
```

```
    for(gallons=1;gallons<=100;gallons++)
```

```
{
```

```
        liters=gallons*3.7854; //convert to liters
```

```
        System.out.println(gallons+ " gallons is "+ liters+ " liters. "
);
    counter++;
    if(counter == 10)
    {
        System.out.println();
        counter=0;
    }
}
}
```

```
class sound
{
    public static void main(String args[])
    {
        double dist;
        dist=7.2*1100;
        System.out.println("the lightning is " +dist+ " feet away.");
    }
}
```

---

```
class fdemo
{
    int x;
    fdemo(int i)
    {
        x=i;
    }
    protected void finalize()
    {
        System.out.println("finalizing "+ x);
    }
    void generator(int i)
    {
        fdemo o=new fdemo(i);
    }
}

class finalize
{
    public static void main(String args[])
    {
        int count;
        fdemo ob=new fdemo(0);
        for(count=1;count<100000;count++)
        {
    }
```

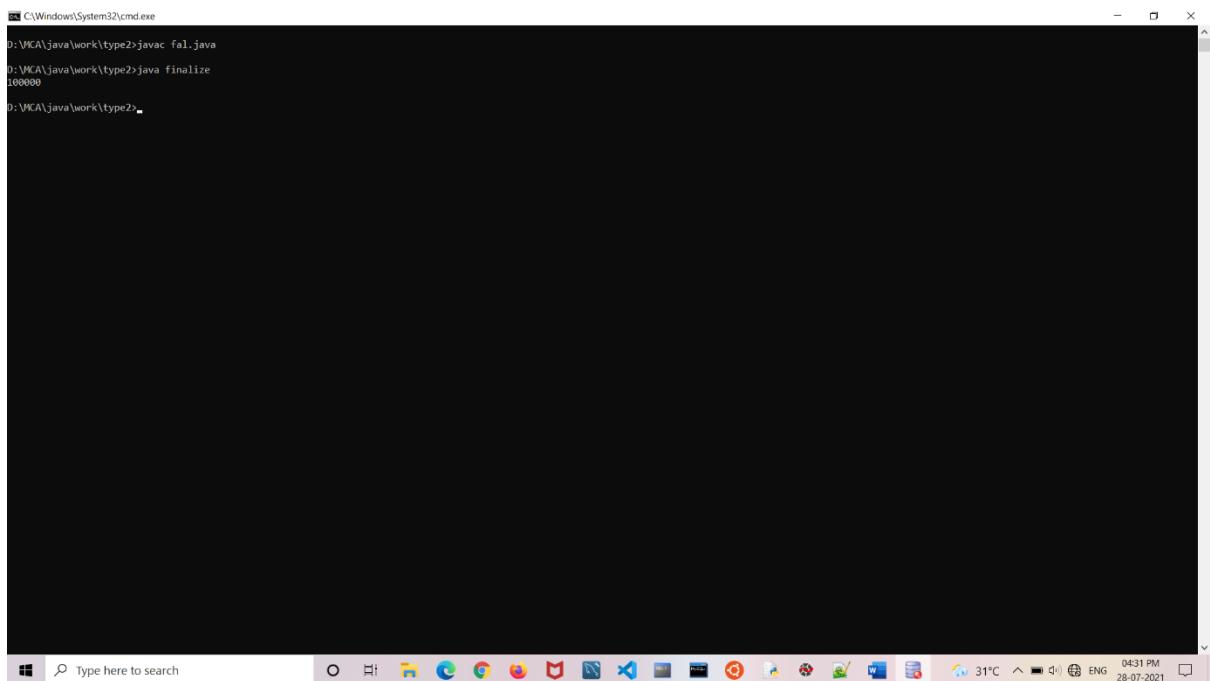
```
    ob.generator(count);

}

System.out.println(count);

}

}
```

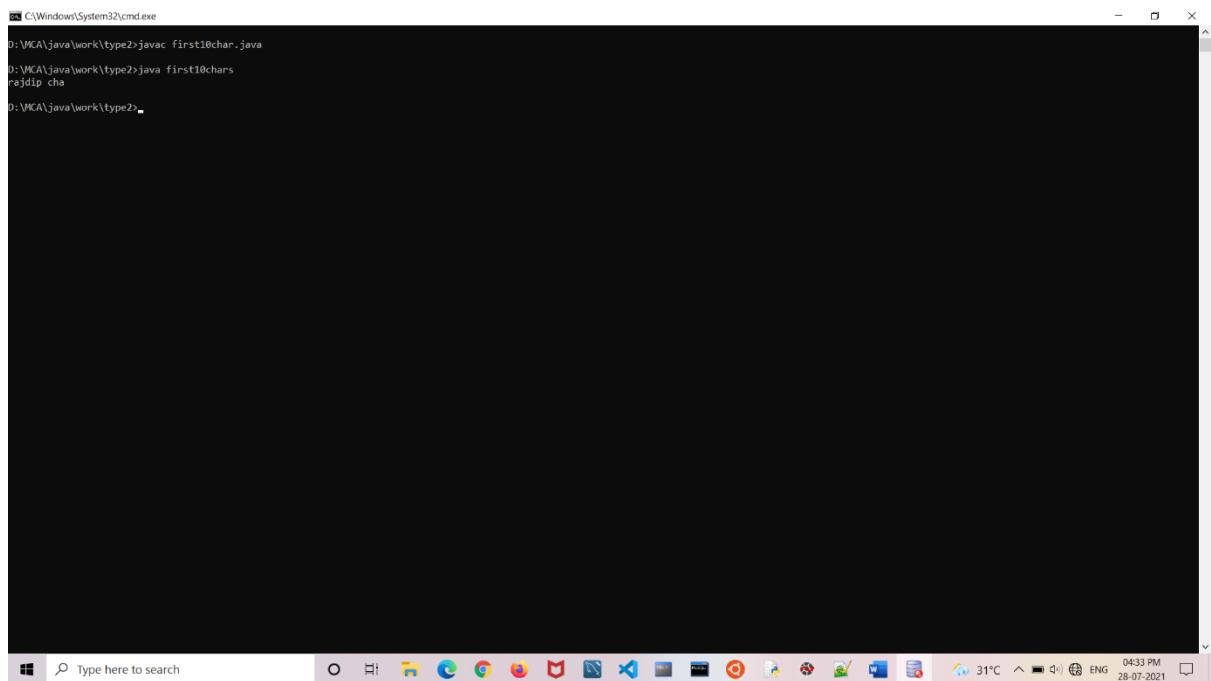


---

```
class first10chars

{
    public static void main(String args[])
    {
        String s="rajdip chavda daxesh chavda";
        String substring=s.substring(0,10);
        System.out.println(substring);
    }
}
```

}



C:\Windows\System32\cmd.exe  
D:\MCA\java\work\type2>javac first10char.java  
D:\MCA\java\work\type2>java first10chars  
rajdip chahal@DESKTOP-7F5PQHJ MINGW64 Bit: x86\_64  
D:\MCA\java\work\type2>

---

/\*

This program converts gallons to liters

\*/

public class GalToLit

{

    public static void main(String[] args)

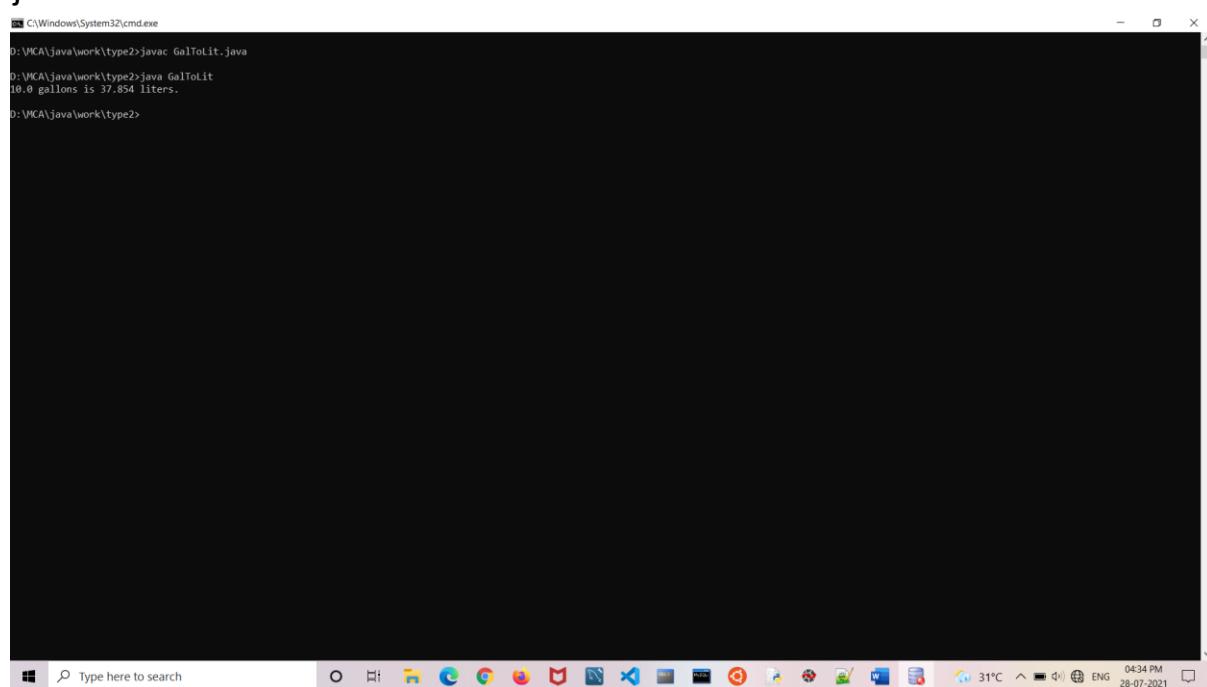
    {

        double gallons; //holds the numbers of gallons

        double liters; //holds the numbers of liters

        gallons = 10;

```
liters = gallons * 3.7854; //convert to liters  
System.out.println(gallons + " gallons is "+liters+" liters.");  
}  
}
```



```
C:\Windows\System32\cmd.exe  
D:\VCA\java\work\type2>javac GalToLit.java  
D:\VCA\java\work\type2>java GalToLit  
10.0 gallons is 37.854 liters.  
D:\VCA\java\work\type2>
```

---

```
class Immutablestr{  
    public static void main(String args[]){  
        String s="MCAII";  
        s.concat("PACEMENT prep");  
        System.out.println(s);  
    }  
}
```

```
class Immutablestring1{  
    public static void main(String args[])  
    {  
        String s="MCAII";  
        s=s.concat("PACEMENT prep");  
        System.out.println(s);  
    }  
}
```

The screenshot shows a Windows command prompt window titled 'C:\Windows\System32\cmd.exe'. The command line shows the execution of Java code:

```
D:\MCA\java\work\type2>javac Immutablestr.java  
D:\MCA\java\work\type2>java Immutablestr  
MCAII  
D:\MCA\java\work\type2>java Immutablestring1  
MCAIIPACEMENT prep  
D:\MCA\java\work\type2>
```

The output of the program is displayed in the terminal window.

---

```
public class jagged  
{  
    public static void main(String args[]){  
        {  
/*      int a=5,b=6,c=7,d=8;
```

```
int x[]={5,6,7,8};  
int y[]={6,7,8,9};  
int z[]={7,8,9,6};  
  
  
int p[][]={  
    {5,6,7,8},  
    {6,7,8,9},  
    {7,8,9,6}  
};  
  
  
for(int i[] : p)  
{  
    for(int j : i )  
    {  
        System.out.print(j + " ");  
    }  
}  
System.out.println(""); */  
  
  
int a=5,b=6,c=7,d=8;  
int x[]={5,6,7,8};  
int y[]={6,7};  
int z[]={7,8,9};
```

```
int k[][] = new int[3][];
k[0] = new int[4];
k[1] = new int[2];
k[2] = new int[3];

int p[][] ={
    {5,6,7,8},
    {6,7},
    {7,8,9}
};

for(int i[] : p)
{
    for(int j : i)
    {
        System.out.print(j + " ");
    }
    System.out.println();
}
}
```

---

```
public class jagged1{
    public static void main(String args[])
    {
        int a=5,b=6,c=7,d=8;
        int x[]={5,6,7,8};
        int y[]={6,7};
        int z[]={7,8,9};

        //create array with name K
        int k[][]=new int [3][];
        //the problem starts here ,if i know the size of my array is 3row
        and 4 cols and i havve
        //we don't know number number of cols so remove
        //but how to assign value
        k[0]=new int [4];
        k[1]=new int [2];
        k[2]=new int [3];

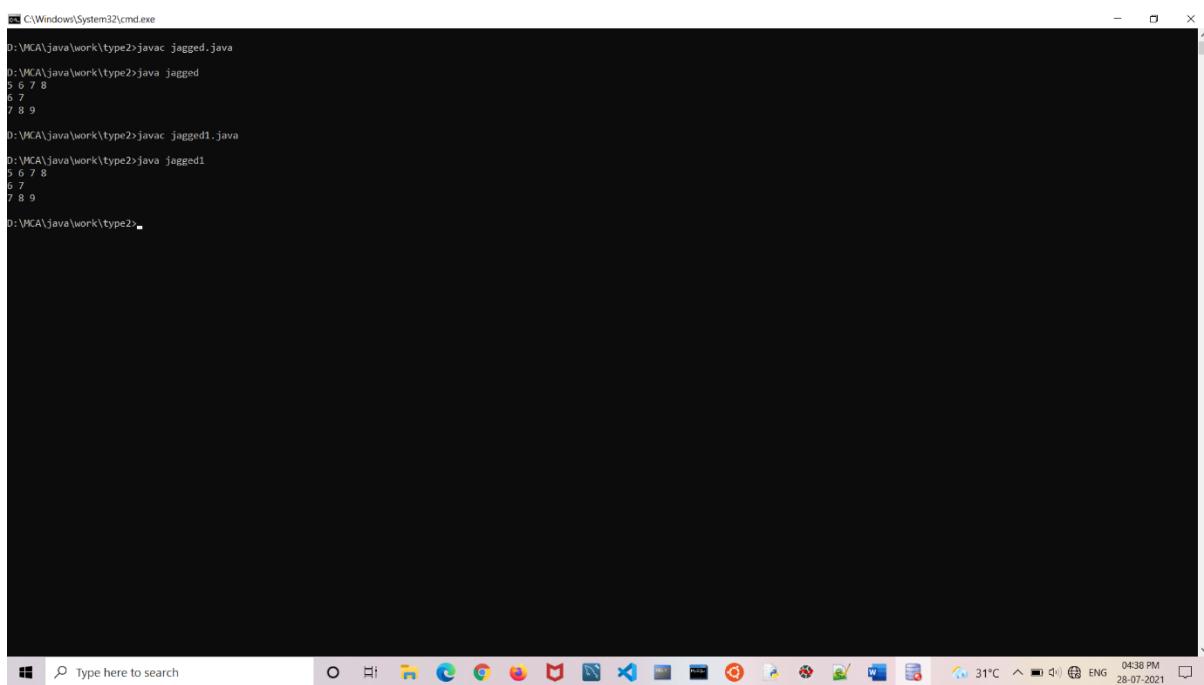
        int p[][]={{5,6,7,8},{6,7},{7,8,9} };
        for(int i[] : p)
        {
            for(int j : i)
```

```

{
    System.out.print(j+" ");
}
System.out.println();
}

}

```



The screenshot shows a Windows command prompt window titled 'C:\Windows\System32\cmd.exe'. The command line shows the path 'D:\VCA\java\work\type2>' followed by the command 'javac jagged.java'. The output of the compilation is shown below the command. Then, the command 'java jagged' is run, and the output is displayed as a 3x3 grid of numbers: 5 6 7 8 6 7 7 8 9. Finally, the command 'javac jagged1.java' is run, and the output of the compilation is shown.

```

C:\Windows\System32\cmd.exe
D:\VCA\java\work\type2>javac jagged.java
D:\VCA\java\work\type2>java jagged
5 6 7 8
6 7
7 8 9
D:\VCA\java\work\type2>javac jagged1.java
D:\VCA\java\work\type2>java jagged1
5 6 7 8
6 7
7 8 9
D:\VCA\java\work\type2>

```

---

```

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

```

```
int p[][]={{5,6,7,8},{6,7},{7,8,9}};  
for(int i[]:p)  
{  
    for(int j:i)  
    {  
        System.out.print(j+" ");  
    }  
    System.out.println("");  
}  
}
```

The screenshot shows a Windows command prompt window titled 'C:\Windows\System32\cmd.exe'. The command 'javac jaggedarray.java' is entered, followed by 'java jaggedarray'. The output displays the elements of the jagged array: 5 6 7 8, 6 7, and 7 8 9, each on a new line. The taskbar at the bottom shows various application icons, and the system tray indicates the date and time as 28-07-2021 04:40 PM.

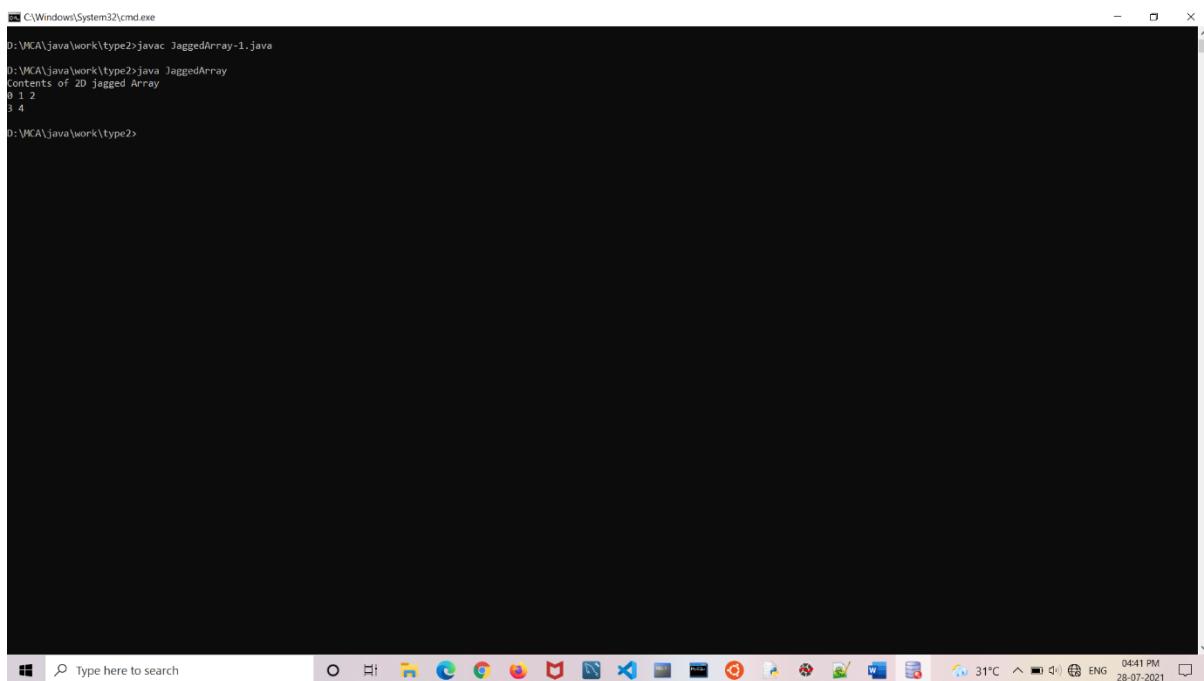
```
C:\Windows\System32\cmd.exe  
D:\VCA\java\work\type2>javac jaggedarray.java  
D:\VCA\java\work\type2>java jaggedarray  
5 6 7 8  
6 7  
7 8 9  
D:\VCA\java\work\type2>
```

---

```
class JaggedArray
{
    public static void main(String args[])
    {
        //declaring 2D arrays with 2 rows
        int arr[][] = new int[2][];
        // Making the above array jagged
        //first row has 3 columns
        arr[0] = new int[3];
        //second rows has 2 columns
        arr[1] = new int[2];
        int count = 0;
        for(int i=0 ; i<arr.length ; i++)
        {
            for(int j=0 ; j<arr[i].length ; j++)
                arr[i][j] = count++;
        }
        System.out.println("Contents of 2D jagged Array");
        for(int i=0; i<arr.length ; i++)
        {
            for(int j=0 ; j<arr[i].length; j++)

```

```
System.out.print(arr[i][j] + " ");  
  
        System.out.println();  
    }  
}  
}
```



A screenshot of a Windows Command Prompt window titled 'C:\Windows\System32\cmd.exe'. The command entered is 'D:\VCA\Java\work\type2>javac JaggedArray-1.java'. The output shows the contents of a 2D jagged array: 'Contents of 2D Jagged Array' followed by the elements '0 1 2' and '3 4'. The system tray at the bottom right shows the date as 28-07-2021 and the time as 04:41 PM.

---

```
public class JavaOperators_Bit  
{  
    public static void main(String args[])  
    {  
        int a=58;  
        int b=13;
```

```
        System.out.println(a&b);
        System.out.println(a|b);
        System.out.println(a^b); //bitwise XOR
        System.out.println(~a); // binary compliment operator
    }
}

//program for right shift , left shift and unsigned right operator
//syntax is..... number shift_operator
number_of_places_to_shift

public class JavaOperators_BitShift
{
    public static void main(String args[])
    {
        int a=58;
        System.out.println(a<<2); //left shift
        System.out.println(a>>2); //right shift
        System.out.println(a>>>2); //unsigned right shift
    }
}

public class javaoprator_bit
{
```

```
public static void main(String args[])
{
    int a=58;
    int b=13;
    System.out.println(a&b);
    System.out.println(a|b);
    System.out.println(a^b);
    System.out.println(~a);
}
```

```
public class javaoprator_bitshift
{
    public static void main(String args[])
    {
        int a=58;
        System.out.println(a<<2);
        System.out.println(a>>2);
        System.out.println(a>>>2);
    }
}
```

```
}
```

The screenshot shows a Windows command prompt window titled 'C:\Windows\System32\cmd.exe'. The command line shows the execution of several Java programs related to bit operators. The output displays numerical values (8, 63, 65, -59, 232, 14, 14) which are likely the results of the bit operations performed in the code. The taskbar at the bottom shows various pinned icons and the system tray indicates the date and time as 28-07-2021 04:43 PM.

```
C:\Windows\System32\cmd.exe
D:\VCA\java\work\type2>javac JavaOperators_Bit.java
D:\VCA\java\work\type2>java JavaOperators_Bit
8
63
65
-59
D:\VCA\java\work\type2>javac JavaOperators_BitShift.java
D:\VCA\java\work\type2>java JavaOperators_BitShift
232
14
14
D:\VCA\java\work\type2>javac javaoperator_bit.java
D:\VCA\java\work\type2>java javaoperator_bit
8
63
65
-59
D:\VCA\java\work\type2>javac javaoperator_bitshift.java
D:\VCA\java\work\type2>java javaoperator_bitshift
232
14
14
D:\VCA\java\work\type2>
```

---

```
public class lettercheck
```

```
{
```

```
    public static void main(String[] args)
```

```
{
```

```
        char symbol ='A';
```

```
        symbol = (char)(128.0*Math.random()); // Generate a
random character
```

```
        if(symbol >='A')
```

```
{
```

```
            // Is it A or greater?
```

```
            if(symbol <='Z')
```

```
{
```

```
// yes, and is it Z or less?  
// Then it is a capital letter  
System.out.println("You have the capital letter  
"+symbol);  
  
}  
  
else  
  
{  
  
// It is not Z or less  
if(symbol >='A')  
  
{  
  
// So is it a or greater?  
if(symbol <='Z')  
  
{  
  
// Yes, so is it z or less?  
// Then it is a small letter  
System.out.println("You have the  
small letter " + symbol);  
  
}  
  
else  
  
{  
  
// It is not less than z  
System.out.println("The code is  
greater than a but it's not a letter");  
  
}  
  
}
```

```
        else
        {
            System.out.println("The code is less than
a and it's not a letter");
        }

    }

else
{
    System.out.println("The code is less than A so it's
not a letter");
}

}

}
```

The screenshot shows a Windows command prompt window titled 'C:\Windows\System32\cmd.exe'. The command 'javac lettercheck.java' is entered and executed, followed by 'java lettercheck'. The output shows the message 'The code is greater than a but it's not a letter'. The system tray at the bottom right indicates a temperature of 31°C, battery level, and network status.

```
C:\Windows\System32\cmd.exe
D:\VCA\java\work\type2>javac lettercheck.java
D:\VCA\java\work\type2>java lettercheck
The code is greater than a but it's not a letter
D:\VCA\java\work\type2>
```

---

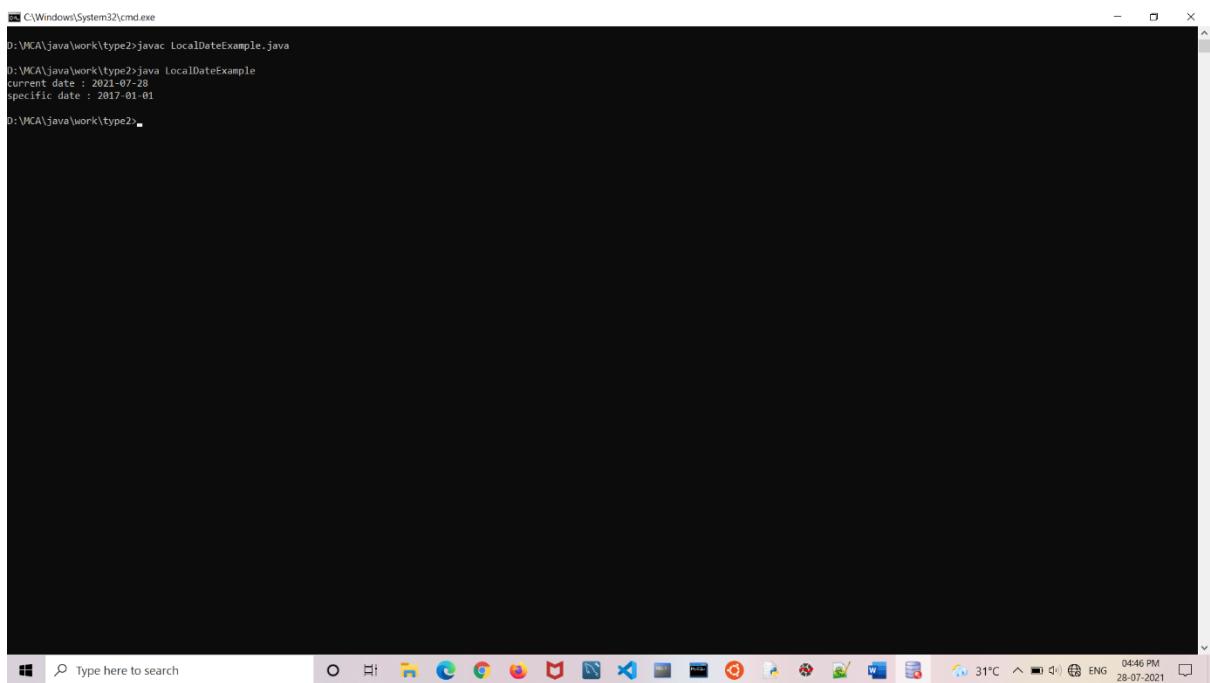
```
import java.time.LocalDate;
import java.time.Month;
import java.time.ZoneId;

public class LocalDateExample
{
    public static void main(String args[])
    {
        //current date
        LocalDate today = LocalDate.now();
        System.out.println("current date : " + today);

        //creating localdate by providing input arguments
        LocalDate firstDay_2017 =
LocalDate.of(2017,Month.JANUARY,1);
        System.out.println("specific date : " + firstDay_2017);

    }
}
```

```
}
```



A screenshot of a Windows command prompt window titled 'C:\Windows\System32\cmd.exe'. The window contains the following text:

```
D:\VMCA\java\work\type2>javac LocalDateExample.java
D:\VMCA\java\work\type2>java LocalDateExample
Current date : 2021-07-28
specific date : 2017-01-01
```

The window has a dark background and a light gray border. At the bottom, there is a taskbar with various icons for applications like File Explorer, Edge, and Control Panel. The system tray shows the date as '28-07-2021' and the time as '04:46 PM'. The weather icon indicates '31°C'.

---

```
class logicaloptable
```

```
{
```

```
    public static void main(String args[])
    {
```

```
        boolean p,q;
```

```
        System.out.println("P\tQ\tAND\tOR\tXOR\tNOT");
```

```
        System.out.println("-----");
        "');
```

```
        p=true;q=true;
```

```
        System.out.println(p+"\t"+q+"\t"+(p&q)+"\t"+(p|q)+"\t"+(p^q)
        +"\t"+(!p));
```

```
p=true;q=false;
```

```
System.out.println(p+"\t"+q+"\t"+(p&q)+"\t"+(p|q)+"\t"+(p^q)
+"\\t"+(!p));
```

```
p=false;q=true;
```

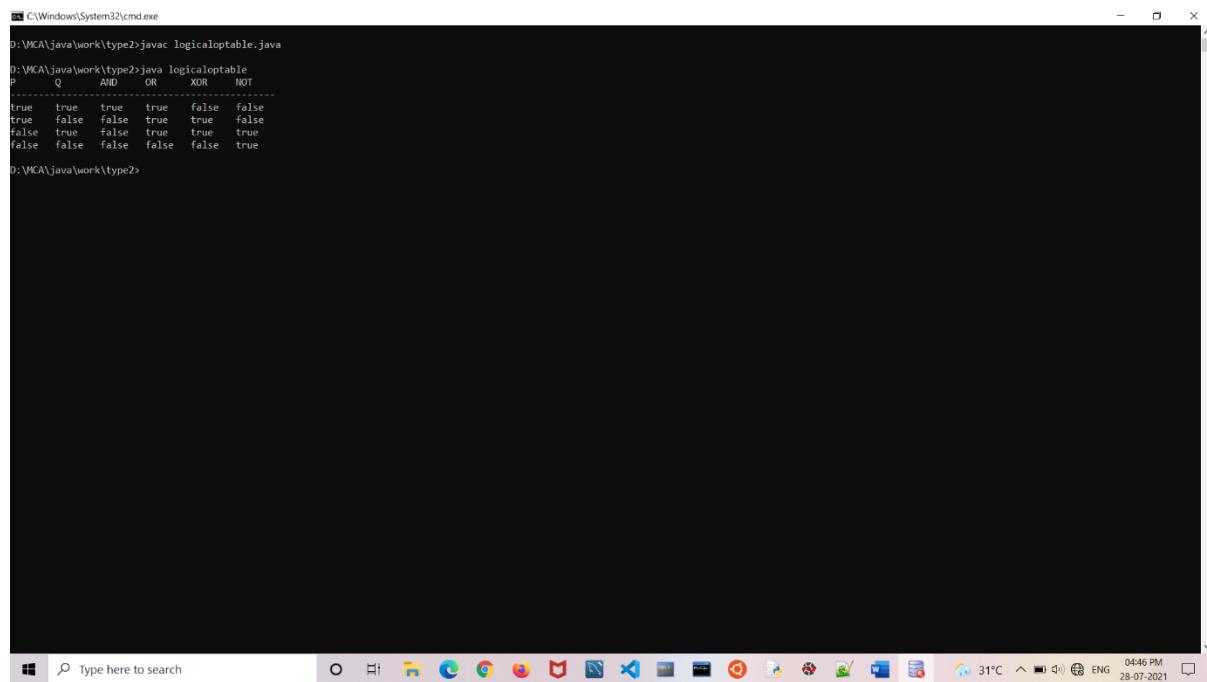
```
System.out.println(p+"\t"+q+"\t"+(p&q)+"\t"+(p|q)+"\t"+(p^q)
+"\\t"+(!p));
```

```
p=false;q=false;
```

```
System.out.println(p+"\t"+q+"\t"+(p&q)+"\t"+(p|q)+"\t"+(p^q)
+"\\t"+(!p));
```

```
}
```

```
}
```



The screenshot shows a Windows command prompt window titled 'C:\Windows\System32\cmd.exe'. The command entered is 'D:\VMCA\java\work\type2>javac logicaloptable.java' followed by 'D:\VMCA\java\work\type2>java logicaloptable'. The output displays a truth table for logical operations:

P	Q	AND	OR	XOR	NOT
true	true	true	true	false	false
true	false	false	true	true	false
false	true	false	true	true	true
false	false	false	false	false	true

The command prompt also shows the current directory as 'D:\VMCA\java\work\type2>' and the system status at the bottom right.

```
-----  
class swap  
{  
    public static void main(String args[])  
    {  
        int a=10,b=20,c;  
        System.out.println("A="+a);  
        System.out.println("B="+b);  
        System.out.println("-----");  
        c=a;a=b;b=c;  
        System.out.println("A="+a);  
        System.out.println("B="+b);  
    }  
}  
}
```

The screenshot shows a Windows Command Prompt window titled 'C:\Windows\System32\cmd.exe'. The command line shows the execution of a Java program named 'swap'. The output of the program is displayed, showing the initial values of variables A and B, followed by a separator line, and then the swapped values where A is now 20 and B is now 10.

```
C:\Windows\System32\cmd.exe  
D:\MCA\java\work\type2>javac swap.java  
D:\MCA\java\work\type2>java swap  
A=10  
B=20  
-----  
A=20  
B=10  
D:\MCA\java\work\type2>
```

---

```
import java.util.Arrays;
import java.util.*;
class Test
{
    public static void main(String args[])
    {
        double[] m = new double[4];
        m[0]=1.2;
        m[1]=2.5;
        m[2]=3.4;
        m[3]=1.1;

        System.out.println(m[0] + "\n" + m[1] + "\n"+ m[2] + "\n"
+ m[3]);

        double total;
        total = m[0] + m[1] + m[2] + m[3];
        System.out.println("total is : " + total);

        Arrays.sort(m);
```

```
        System.out.println("minimum is : " + m[0]);  
        System.out.println("maximum is : " + m[m.length-1]);  
    }  
}
```

A screenshot of a Windows command prompt window titled 'C:\Windows\System32\cmd.exe'. The window shows the following command-line session:

```
D:\VCA\java\work\type2>javac Test.java  
D:\VCA\java\work\type2>java Test  
1.2  
2.5  
3.4  
1.1  
total is : 8.2  
minimum is : 1.1  
maximum is : 3.4
```

The command 'javac Test.java' compiles the Java source code, and 'java Test' runs it. The output displays the elements of the array and their sum.

---

```
class teststring  
{  
    public static void main(String args[])  
    {  
        String s1="Test";  
        String s2="Test";  
        String s3=new String("Test");  
        final String s4=s3.intern();
```

```
System.out.println(s1 == s2);
System.out.println(s2 == s3);
System.out.println(s3 == s4);
System.out.println(s1 == s3);
System.out.println(s1 == s4);

System.out.println(s1.equals(s2));
System.out.println(s2.equals(s3));
System.out.println(s3.equals(s4));
System.out.println(s1.equals(s4));
System.out.println(s1.equals(s3));

}

}

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

}
```

}

C:\Windows\System32\cmd.exe

D:\VMCA\java\work\type2>javac teststring.java

D:\VMCA\java\work\type2>java teststring

```
true
false
false
true
true
true
true
true
true
```

D:\VMCA\java\work\type2>

The screenshot shows a Windows operating system interface. At the top is a dark window titled "C:\Windows\System32\cmd.exe" displaying Java command-line output. Below this is the Windows taskbar, which includes a search bar, pinned icons for various applications like File Explorer, Internet Explorer, and Microsoft Edge, and system status indicators for battery level, network connection, and date/time (31°C, ENG, 04:49 PM, 28-07-2021).

---

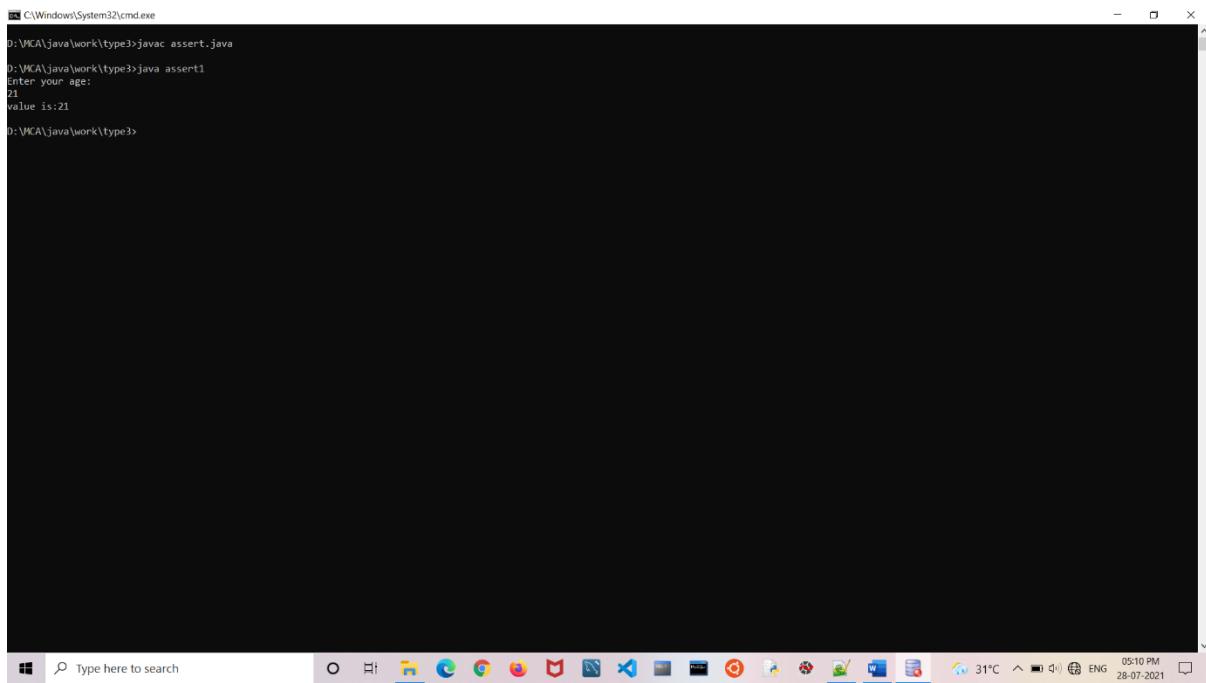
## Class Work – Inheritance , Scanner Class , Date and Time ,Try and Throw and String

---

```
import java.util.Scanner;

class assert1

{
    public static void main(String args[])
    {
        Scanner n=new Scanner(System.in);
        System.out.println("Enter your age:");
        int value=n.nextInt();
        assert value>=18:"not valid";
        System.out.println("value is:"+value);
    }
}
```



A screenshot of a Windows Command Prompt window titled 'C:\Windows\System32\cmd.exe'. The window shows the following command-line session:

```
D:\VMCA\java\work\type3>javac assert.java
D:\VMCA\java\work\type3>java assert1
Enter your age:
21
value is:21
D:\VMCA\java\work\type3>
```

The window has a dark background and light-colored text. The taskbar at the bottom shows various pinned icons and the system tray with the date and time.

---

```
import java.text.DateFormatSymbols;
import java.util.*;

public class CalendarTest
{
    public static void main(String[] args)
    {
        GregorianCalendar d = new GregorianCalendar ();
        int today = d.get(Calendar.DAY_OF_MONTH);
        int month = d.get(Calendar.MONTH);
        d.set(Calendar.DAY_OF_MONTH,1);

        int weekday = d.get(Calendar.DAY_OF_WEEK);
```

```
int firstDayOfWeek = d.getFirstDayOfWeek();  
  
int indent = -1;  
  
while(weekday !=firstDayOfWeek)  
{  
    indent++;  
    d.add(Calendar.DAY_OF_MONTH,1);  
    weekday=d.get(Calendar.DAY_OF_WEEK);  
}  
  
String[] weekdayNames = new  
DateFormatSymbols().getShortWeekdays();  
  
do  
{  
    System.out.printf("%4s",weekdayNames[weekday]);  
    d.add(Calendar.DAY_OF_MONTH,1);  
    weekday = d.get(Calendar.DAY_OF_WEEK);  
}while(weekday !=firstDayOfWeek);  
System.out.println();  
  
for(int i=1;i<=indent;i++)
```

```
System.out.print(" ");

d.set(Calendar.DAY_OF_MONTH,1);

do
{
    int day=d.get(Calendar.DAY_OF_MONTH);
    System.out.printf("%3d",day);

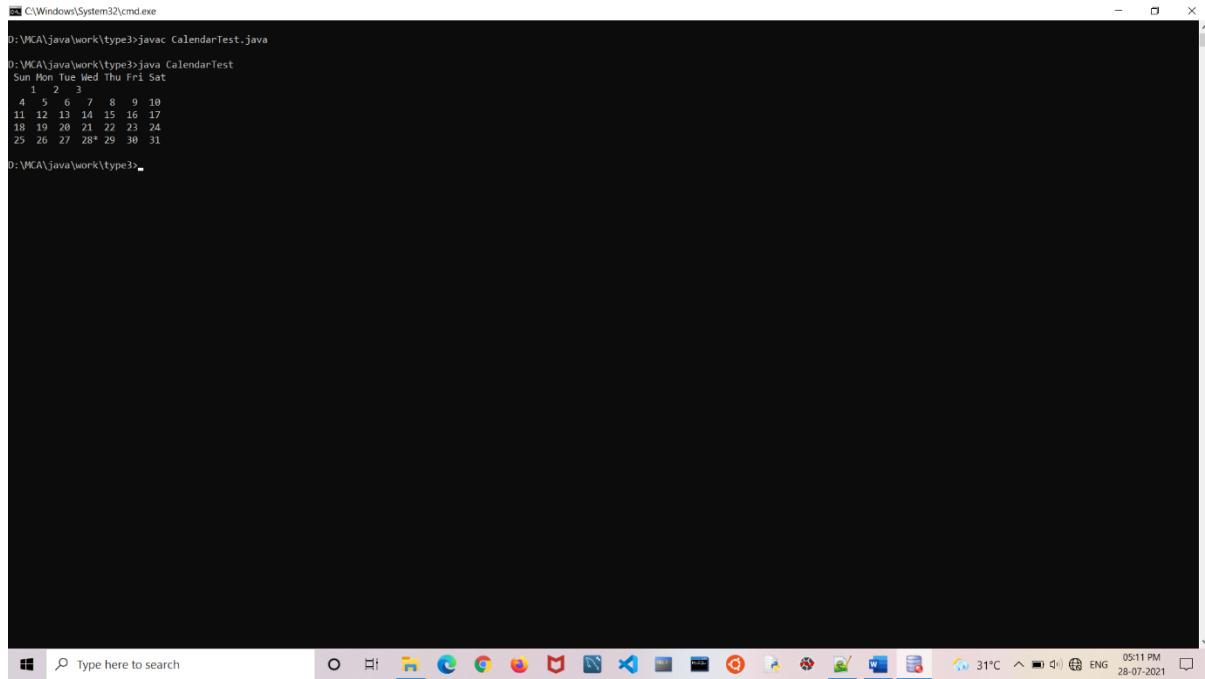
    if(day == today) System.out.print("*");
    else System.out.print(" ");

    d.add(Calendar.DAY_OF_MONTH,1);
    weekday = d.get(Calendar.DAY_OF_WEEK);

    if(weekday == firstDayOfWeek)
        System.out.print("\n");
}while(d.get(Calendar.MONTH)==month);

if(weekday !=firstDayOfWeek) System.out.println();
```

```
}
```



```
C:\Windows\System32\cmd.exe
D:\VCA\java\work\type3>javac CalendarTest.java
D:\VCA\java\work\type3>java CalendarTest
Sun Mon Tue Wed Thu Fri Sat
 1  2  3  4  5  6  7  8  9  10
11 12 13 14 15 16 17
18 19 20 21 22 23 24
25 26 27 28 29 30 31
D:\VCA\java\work\type3>
```

---

```
import java.text.DateFormatSymbols;
```

```
import java.util.*;
```

```
//import java.util.Calendar;
```

```
class CalendarTest
```

```
{
```

```
    public static void main(String[] args)
```

```
{
```

```
        GregorianCalendar d = new GregorianCalendar();
```

```
        int today = d.get(Calendar.DAY_OF_MONTH);
```

```
int month = d.get(Calendar.MONTH);

d.set(Calendar.DAY_OF_MONTH,2);

int weekday = d.get(Calendar.DAY_OF_WEEK);

int firstDayOfWeek = d.getFirstDayOfWeek();

int indent = 0;

while (weekday != firstDayOfWeek)

{

    indent++;

    d.add(Calendar.DAY_OF_MONTH,-1);

    weekday = d.get(Calendar.DAY_OF_WEEK);

}

String[] weekdayNames = new

DateFormatSymbols().getShortWeekdays();

do

{

    System.out.printf("%4s",weekdayNames[weekday]);

    d.add(Calendar.DAY_OF_MONTH,1);

    weekday=d.get(Calendar.DAY_OF_WEEK);
```

```
}

while(weekday != firstDayOfWeek);

System.out.println();

for (int i = 1;i<=indent;i++)

System.out.println(" ");

d.set(Calendar.DAY_OF_MONTH, 1);

do

{

    int day = d.get(Calendar.DAY_OF_MONTH);

    System.out.printf("%3d",day);

    if(day == today) System.out.print("*");

    else System.out.print(" ");

    d.add(Calendar.DAY_OF_MONTH, 1);

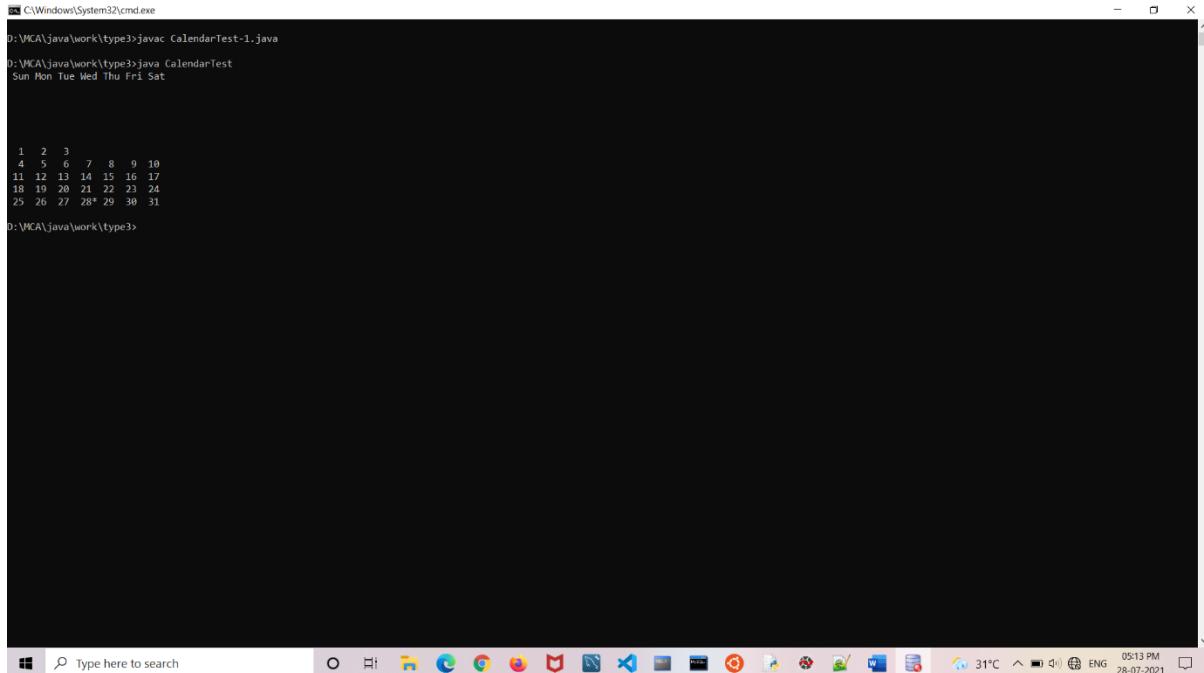
    weekday = d.get(Calendar.DAY_OF_WEEK);

    if(weekday == firstDayOfWeek) System.out.println();

}

while(d.get(Calendar.MONTH) == month);
```

```
        if(weekday != firstDayOfWeek) System.out.println();  
    }  
  
}
```



```
C:\Windows\System32\cmd.exe  
D:\MCA\java\work\type3>javac CalendarTest-1.java  
D:\MCA\java\work\type3>java CalendarTest  
Sun Mon Tue Wed Thu Fri Sat  
  
1 2 3  
4 5 6 7 8 9 10  
11 12 13 14 15 16 17  
18 19 20 21 22 23 24  
25 26 27 28 29 30 31  
D:\MCA\java\work\type3>
```

---

```
import java.text.DateFormatSymbols;  
import java.util.*;  
class calender  
{  
    public static void main(String[] args)  
    {  
        GregorianCalendar d = new GregorianCalendar ();  
        int today = d.get(Calendar.DAY_OF_MONTH);  
        int month = d.get(Calendar.MONTH);  
        d.set(Calendar.DAY_OF_MONTH,1);
```

```
int weekday = d.get(Calendar.DAY_OF_WEEK);
int firstDayOfWeek = d.getFirstDayOfWeek();

int indent = -1;

while(weekday !=firstDayOfWeek)
{
    indent++;
    d.add(Calendar.DAY_OF_MONTH,1);
    weekday=d.get(Calendar.DAY_OF_WEEK);
}

String[] weekdayNames = new
DateFormatSymbols().getShortWeekdays();

do
{
    System.out.printf("%4s",weekdayNames[weekday]);
    d.add(Calendar.DAY_OF_MONTH,1);
    weekday = d.get(Calendar.DAY_OF_WEEK);
}while(weekday !=firstDayOfWeek);
```

```
System.out.println();

for(int i=1;i<=indent;i++)

    System.out.print(" ");
```

```
d.set(Calendar.DAY_OF_MONTH,1);
```

```
do

{

    int day=d.get(Calendar.DAY_OF_MONTH);

    System.out.printf("%3d",day);
```

```
if(day == today)

    System.out.print("*");

else

    System.out.print(" ");
```

```
d.add(Calendar.DAY_OF_MONTH,1);

weekday = d.get(Calendar.DAY_OF_WEEK);
```

```
if(weekday == firstDayOfWeek)
```

```

        System.out.print("\n");
    }while(d.get(Calendar.MONTH)==month);

    if(weekday !=firstDayOfWeek)
        System.out.println();

    }

}

```

```

C:\Windows\System32\cmd.exe
D:\MCA\java\work\type3>javac calender.java
D:\MCA\java\work\type3>java calender
Sun Mon Tue Wed Thu Fri Sat
 1  2   3   4   5   6   7   8   9   10
11 12 13 14 15 16 17
18 19 20 21 22 23 24
25 26 27 28 29 30 31
D:\MCA\java\work\type3>

```

---

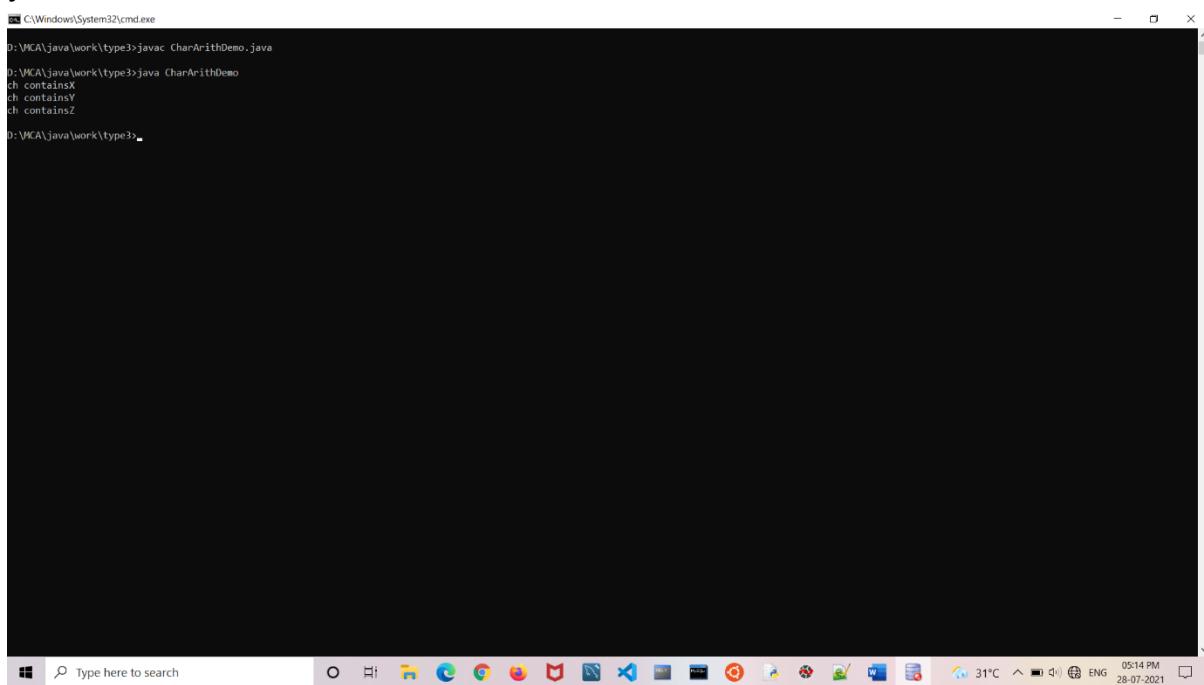
```

class CharArithDemo

{
    public static void main(String args[])
    {
        char ch;

```

```
ch='X';  
System.out.println("ch contains" + ch);  
  
ch++;  
System.out.println("ch contains" + ch);  
  
ch=90;  
//ch++;  
System.out.println("ch contains" + ch);  
  
}  
}
```



A screenshot of a Windows command prompt window titled 'C:\Windows\System32\cmd.exe'. The window shows the following command-line session:

```
D:\VCA\java\work\type3>javac CharArithDemo.java  
D:\VCA\java\work\type3>java CharArithDemo  
ch containsX  
ch containsY  
ch containsZ  
D:\VCA\java\work\type3>
```

The window has a standard Windows title bar and taskbar at the bottom. The taskbar includes icons for various applications like File Explorer, Edge, and File Explorer.

---

//program for command line argument usinf for loop , program 3

```
class CLDemo

{
    public static void main(String args[])
    {
        System.out.println("there are " + args.length +
"command-line arguments");

        //System.out.println("they are");

        for(int i=0; i<args.length; i++)
        {
            //System.out.println("args[" + i + "]:" +args[i]);

            System.out.println("hello " + args[i]);
        }
    }
}

class CLDemo_number
{
    public static void main(String args[])
    {
        System.out.println("sum is " + (Integer.parseInt(args[0]) +
Integer.parseInt(args[1])));
    }
}
```

```
}
```

C:\Windows\System32\cmd.exe  
D:\MCA\java\work\type3>javac CLDemo.java  
D:\MCA\java\work\type3>java CLDemo rajdip  
there are 1 command-line arguments  
Hello rajdip  
D:\MCA\java\work\type3>javac CLDemo\_number.java  
D:\MCA\java\work\type3>java CLDemo\_number  
Exception in thread "main" java.lang.ArrayIndexOutOfBoundsException: 0  
at CLDemo\_number.main(CLDemo\_number.java:5)  
D:\MCA\java\work\type3>java CLDemo\_number 10 50  
sum is 60  
D:\MCA\java\work\type3>

---

```
class abc
```

```
{
```

```
    public static void main(String args[])
        throws java.io.IOException
    {
        char ch;
        System.out.println("enter");
        ch=(char)System.in.read();
        System.out.println("key"+ch);
    }
}
```

The screenshot shows a Windows Command Prompt window titled 'C:\Windows\System32\cmd.exe'. The command history at the top of the window shows:

```
D:\VICA\java\work\type3>javac extra.java
D:\VICA\java\work\type3>java abc
enter
keyr
D:\VICA\java\work\type3>java abc
enter
rajdip
keyr
D:\VICA\java\work\type3>
```

The taskbar at the bottom of the screen includes icons for File Explorer, Edge, Google Chrome, and other applications. The system tray shows the date (28-07-2021), time (05:19 PM), temperature (31°C), battery status, and network connection.

---

```
class min_sec_hours
{
    public static void main(String args[])
    {
        int min=120;
        int sec,hrs;
        sec=min*60;
        hrs=min/60;
        System.out.println("Mimute :" +min);
        System.out.println("Secend :" +sec);
        System.out.println("Hour :" +hrs);
    }
}
```

```
}
```

A screenshot of a Windows Command Prompt window titled 'C:\Windows\System32\cmd.exe'. The command 'javac min\_sec\_hrs.java' is run, followed by 'java min\_sec\_hrs'. The output shows the conversion of minutes, seconds, and hours. The taskbar at the bottom shows various pinned icons and the date/time as 28-07-2021 05:20 PM.

```
C:\Windows\System32\cmd.exe
D:\VICA\java\work\type3>javac min_sec_hrs.java
D:\VICA\java\work\type3>java min_sec_hrs
Minutes :120
Seconds :7200
Hour :2
D:\VICA\java\work\type3>
```

---

```
class MultiDimensional
```

```
{
```

```
    public static void main(String args[])
    {
```

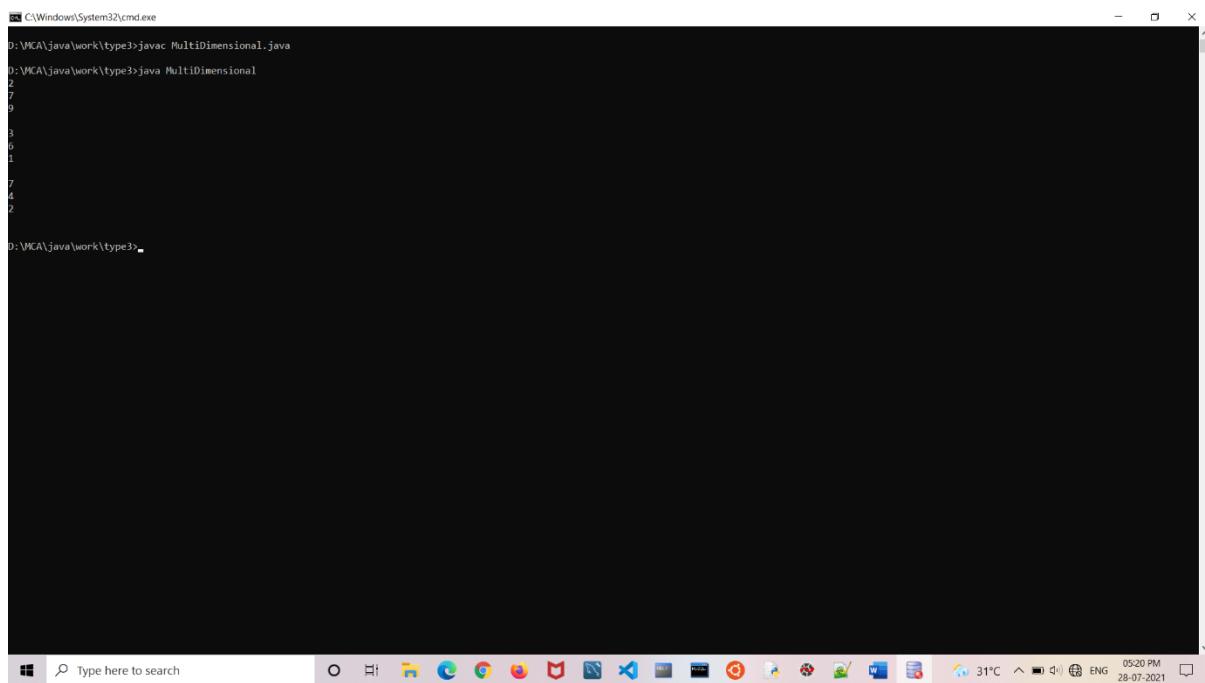
```
        int arr[][] = { {2,7,9} , {3,6,1} , {7,4,2} };
```

```
        //printing 2D array
```

```
        for(int i=0; i<3 ; i++)
        {
```

```
            for(int j=0 ; j<3 ; j++)
                System.out.println(arr[i][j] + " " );
```

```
        System.out.println();  
    }  
}  
}
```



---

```
import java.io.*;  
  
public class numbercheck  
{  
    public static void main(String[] args)  
    {  
        int number = 0;  
  
        number = 1+(int)(100*Math.random()); // Get a random  
integer between 1 & 100  
  
        if(number%2 == 0)
```

```

{
    // Test if it is even
    System.out.println("You have got an even number
:"+number); // It is even
}

else
{
    System.out.println("You have got an odd number
:"+number); // It is odd
}

}

```

```

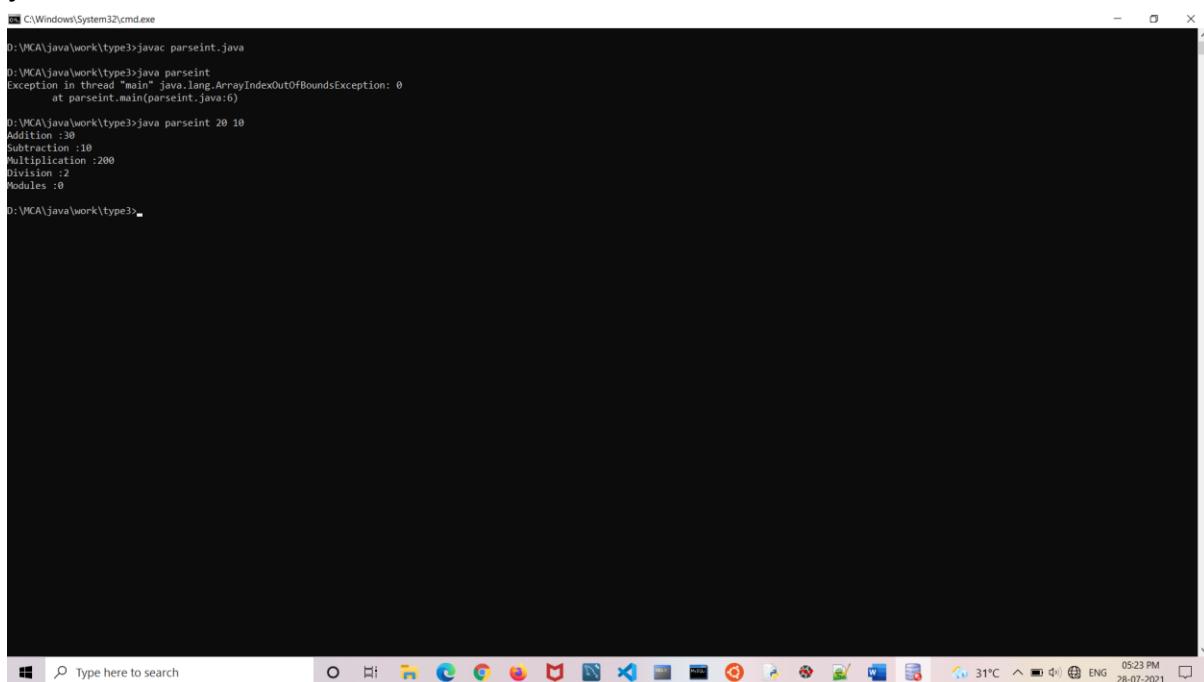
C:\Windows\System32\cmd.exe
D:\VCA\java\work\type3>javac numbercheck.java
D:\VCA\java\work\type3>java numbercheck
You have got an odd number :97
D:\VCA\java\work\type3>

```

The screenshot shows a Windows command prompt window titled 'cmd.exe'. The path 'D:\VCA\java\work\type3' is visible at the top. The user runs 'javac numbercheck.java' to compile the Java file. Then, they run 'java numbercheck' and enter '97' when prompted for a number. The output 'You have got an odd number' is displayed. The taskbar at the bottom shows various application icons, and the system tray indicates the date and time as '28-07-2021 05:22 PM'.

```
class parseint
{
    public static void main(String args[])
    {
        int a=Integer.parseInt(args[0]);
        int b=Integer.parseInt(args[1]);
        int add=a+b;
        int sub=a-b;
        int mul=a*b;
        int div=a/b;
        int mod=a%b;
        System.out.println("Addition :" +add);
        System.out.println("Subtraction :" +sub);
        System.out.println("Multiplication :" +mul);
        System.out.println("Division :" +div);
        System.out.println("Modules :" +mod);
        //System.out.println("sum is :"
        +(Integer.parseInt(args[0])+Integer.parseInt(args[1])));
    }
}
```

```
}
```



A screenshot of a Windows command prompt window titled 'C:\Windows\System32\cmd.exe'. The window contains the following text:

```
D:\VCA\java\work\type3>javac parseint.java
D:\VCA\java\work\type3>java parseint
Exception in thread "main" java.lang.ArrayIndexOutOfBoundsException: 0
at parseint.main(parseint.java:6)
D:\VCA\java\work\type3>java parseint 20 10
Addition :30
Subtraction :10
Multiplication :200
Division :2
Modules :0
D:\VCA\java\work\type3>
```

The window has a dark theme. At the bottom, there is a taskbar with various icons for applications like File Explorer, Edge, and others. The system tray shows the date and time as '28-07-2021 05:23 PM'.

---

```
package abstractClasses;
```

```
public class PersonTest
```

```
{
```

```
    public static void main(String[] args)
```

```
    {
```

```
        Person[] people=new Person[2];
```

```
        people[0]=new Employee("rajdip",50000,2000,10,1);
```

```
        people[1]=new Student("daxesh","computer");
```

```
        for(Person p : people)
```

```
    {
        System.out.println(p.getName() + " ,
"+p.getDescription());
    }
}
```

```
package abstractClasses;
```

```
public abstract class Person
{
    public abstract String getDescription();
    private String name;

    public Person(String n)
    {
        name=n;
    }

    public String getName()
    {
        return name;
    }
}
```

---

```
package abstractClasses;

import java.util.Date;
import java.util.GregorianCalendar;

public class Employee extends Person
{
    private double salary;
    private Date hireDay;

    public Employee(String n,double s,int year,int month,int day)
    {
        super(n);
        salary=s;
        GregorianCalendar calender=new
        GregorianCalendar(year,month-1,day);
        hireDay=calender.getTime();
    }

    public double getSalary()
    {
        return salary;
    }

    public Date getHireDay()
```

```
{  
    return hireDay;  
}  
  
public String getDescription()  
{  
    return String.format("an employee with a salary of  
$%.2f",salary);  
}  
  
public void raiseSalary(double byPercent)  
{  
    double raise=salary*byPercent/100;  
    salary+=raise;  
}  
}  
  
package abstractClasses;  
  
  
public class Student extends Person  
{  
    private String major;  
    public Student(String n,String m)  
    {  
        super(n);  
        major=m;
```

```
}

public String getDescription()

{

    return "a Student majoring in " +major;

}

}
```

---

```
class power

{

    public static void main(String args[])

    {

        double x=2,y=4;

        double c;

        System.out.println("x :" +x);

        System.out.println("y :" +y);

        c=Math.pow(x,y);

        System.out.println("Power(x,y):" +c);

    }

}
```

A screenshot of a Windows Command Prompt window titled 'C:\Windows\System32\cmd.exe'. The window shows the following text:  
D:\VICA\java\work\type3>javac power.java  
D:\VICA\java\work\type3>java power  
x :2.0  
y :4.0  
Power(x,y):16.0  
D:\VICA\java\work\type3>

```
/* try this 5-2

A queue class for Characters

*/
class Queue

{
    char q[];// this array holds the queue
    int putloc,getloc;
    // this put and get induces

    Queue(int size)

    {
        q =new char[size];// allocate memory for queue
        putloc = getloc =0;
    }
}
```

```
// put a character into the queue
void put(char ch)
{
    if(putloc == q.length)
    {
        System.out.println("= Queue is full.");
        return;
    }
    q[putloc++]=ch;
}

//get a character from the queue
char get()
{
    if(getloc== putloc)
    {
        System.out.println(" - Queue is empty. ");
        return (char) 0;
    }
    return q[getloc++];
}

}

// Demonstrate the queue class
class QDemo{
    public static void main(String args[])
}
```

```
{  
    Queue bigQ=new Queue(100);  
    Queue smallQ=new Queue(4);  
    char ch;  
    int i;  
  
    System.out.println("Using bigQ to store the Alphabeet. ");  
    //put some number into bigQ  
    for(i=0;i<26;i++)  
        bigQ.put((char) ('A' + i));  
  
    //retrieve and display elements from bigQ  
    System.out.println("Contents of BigQ :");  
    for(i=0;i<26;i++)  
    {  
        ch=bigQ.get();  
        if(ch != (char) 0)  
            System.out.print(ch);  
    }  
    System.out.println("\n");  
  
    System.out.println("Using smallQ is to generate Errors .");  
    //Now ,use small! to generate some errors  
    for(i=0;i<5;i++)
```

```
{  
    System.out.println("Attempting to store " + (char) ('Z' - i) );  
  
    smallQ.put((char) ('Z' - i));  
    System.out.println();  
}  
System.out.println();  
  
//more errors on smallQ  
System.out.println("Content of smallQ:");  
for(i=0;i<5;i++)  
{  
    ch=smallQ.get();  
  
    if(ch != (char) 0)  
        System.out.println(ch);  
}  
}
```

```
C:\Windows\System32\cmd.exe
D:\VCA\java\work\type3>javac QDemo.java
D:\VCA\java\work\type3>java QDemo
Using bigQ to store the Alphabet.
Content of BigQ :
ABCDEFGHIJKLMNOPQRSTUVWXYZ

Using smallQ is to generate Errors .
Attempting to store Z
Attempting to store Y
Attempting to store X
Attempting to store W
Attempting to store V
= Queue is full.

Content of smallQ:
Z
Y
X
W
- Queue is empty.
D:\VCA\java\work\type3>
```

---

```
class newthread implements Runnable{
```

```
    Thread t;
```

```
    newthread(){
```

```
        t = new Thread(this,"Demo Thread");
```

```
        System.out.println("Child thread: "+t);
```

```
        t.start();
```

```
}
```

```
public void run(){
```

```
    try{
```

```
        for(int i=5;i>0;i--){
```

```
            System.out.println("Child Thread: " + i);
```

```
            Thread.sleep(500);
```

```
        }

    }catch(InterruptedException e){
        System.out.println("Child interrupted");
    }

    System.out.println("Exiting child thread");

}

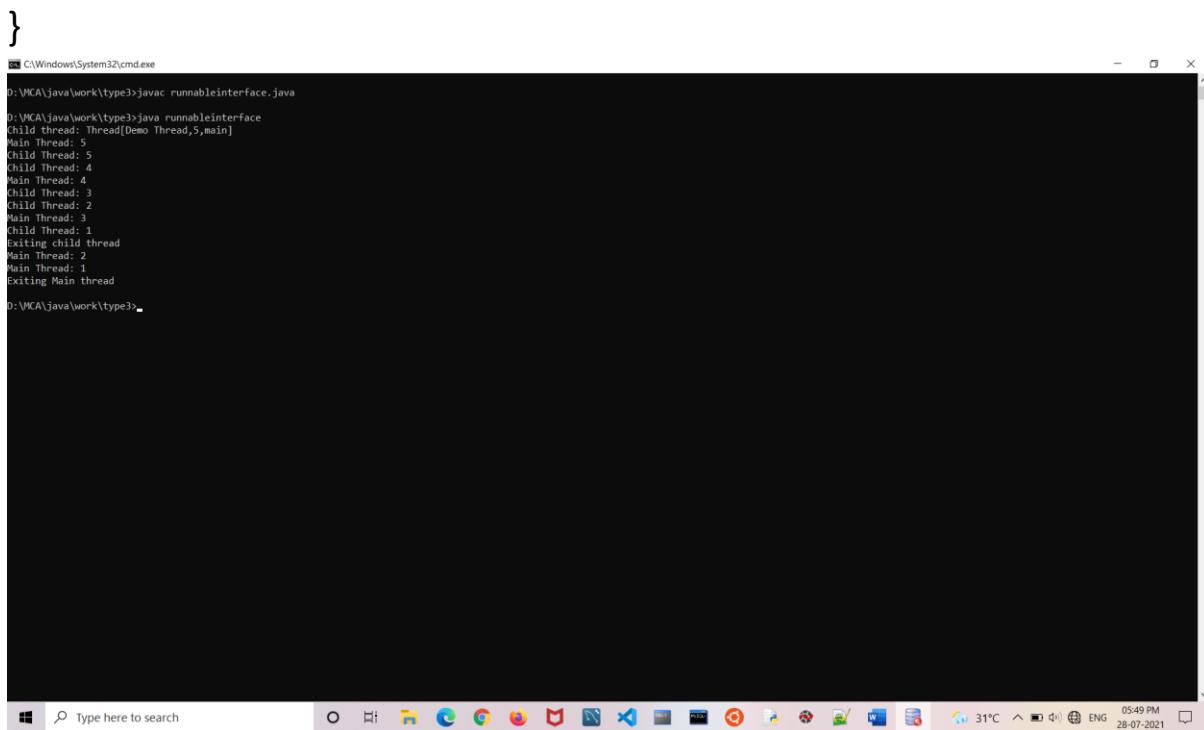
}

class runnableinterface{
    public static void main(String args[]){
        new newthread();

        try{
            for(int i=5;i>0;i--){
                System.out.println("Main Thread: " + i);
                Thread.sleep(1000);
            }
        }catch(InterruptedException e){
            System.out.println("Main interrupted");
        }

        System.out.println("Exiting Main thread");
    }
}
```

```
}
```



A screenshot of a Windows command prompt window titled 'C:\Windows\System32\cmd.exe'. The window contains the following text:

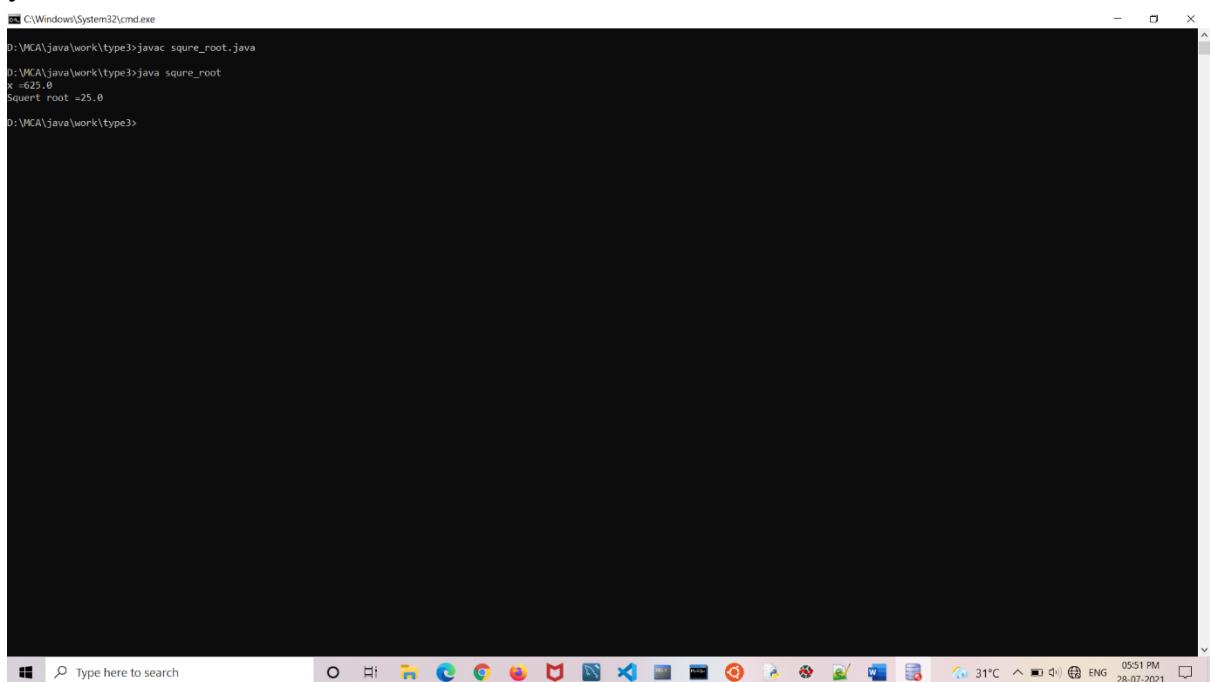
```
D:\VCA\java\work\type3>javac runnableinterface.java
D:\VCA\java\work\type3>java runnableinterface
Main Thread: 5
Child Thread: 5
Child Thread: 4
Main Thread: 4
Child Thread: 3
Child Thread: 2
Main Thread: 3
Child Thread: 3
Child Thread: 1
Exiting child thread
Main Thread: 2
Main Thread: 1
Exiting Main thread
D:\VCA\java\work\type3>
```

The window has a standard Windows title bar and taskbar at the bottom. The taskbar includes icons for various applications like File Explorer, Edge, and File Manager.

---

```
class square_root
{
    public static void main(String args[])
    {
        double x=625,y;
        System.out.println("x =" +x);
        y=Math.sqrt(x);
        System.out.println("Squert root =" +y);
    }
}
```

```
}
```



A screenshot of a Windows command prompt window titled 'C:\Windows\System32\cmd.exe'. The window shows the following text:  
D:\VCA\java\work\type3>javac square\_root.java  
D:\VCA\java\work\type3>java square\_root  
x =625.0  
Squareroot =25.0  
D:\VCA\java\work\type3>

---

```
class stringarray
```

```
{
```

```
    public static void main(String args[])
```

```
{
```

```
        String str[]={ "this", "is", "a", "test" };
```

```
        System.out.println("original array: ");
```

```
        for( String s:str )
```

```
            System.out.println(s+ " " );
```

```
            System.out.println("\n");
```

```
        str[1] = "was";
```

```

        str[2]="test , tool";

System.out.println("modify array :");
for(String s:str)
    System.out.println(s+" ");

}

}

```

The screenshot shows a Windows command prompt window titled 'C:\Windows\System32\cmd.exe'. The command 'java stringarray.java' is run, followed by 'java stringarray'. The output displays the original array content ('this is a test') and the modified array content ('this was test , tool'). The taskbar at the bottom shows various application icons.

```

C:\Windows\System32\cmd.exe
D:\MCA\java\work\type3>javac stringarray.java
D:\MCA\java\work\type3>java stringarray
original array:
this
is
a
test

modify array :
this
was
test , tool
test

D:\MCA\java\work\type3>

```

```

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

```

```

String phrase="the quick brown fox jumped over the lary
dog";

int vowel=0;

for(char ch:phrase.toCharArray())

{

    ch=Character.toLowerCase(ch);

    if(ch=='a'||ch=='i'||ch=='e'||ch=='o'||ch=='u')

    {

        ++vowel;

    }

    System.out.println("the phrase contains "+vowel+""
vowel");

}

}

```

```

C:\Windows\System32\cmd.exe
D:\VCA\java\work>java stringcollection
the phrase contains 0 vowel
the phrase contains 1 vowel
the phrase contains 2 vowel
the phrase contains 3 vowel
the phrase contains 4 vowel
the phrase contains 5 vowel
the phrase contains 6 vowel
the phrase contains 7 vowel
the phrase contains 8 vowel
the phrase contains 9 vowel
the phrase contains 10 vowel
the phrase contains 11 vowel
the phrase contains 12 vowel

```

---

```
public class StringDemo
{
    public static void main(String args[])
    {
        String palindrome = "Dot saw I was Tod";
        int len = palindrome.length();

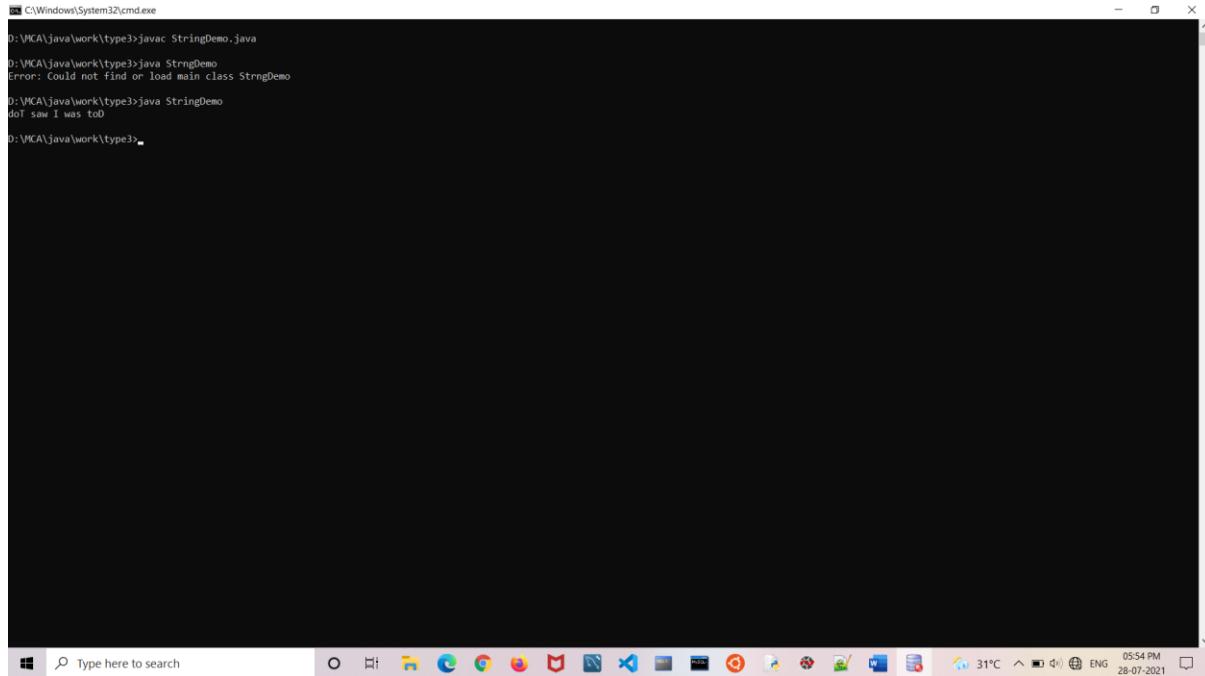
        char[] tempCharArray = new char[len];
        char[] charArray = new char[len];

        //put original string in an array of char
        for(int i = 0 ; i<len ; i++)
        {
            tempCharArray[i] = palindrome.charAt(i);
        }

        //reverse array of char
        for(int j = 0 ; j< len; j++)
        {
            charArray[j] = tempCharArray[len - 1 - j];
        }

        String reversePalindrome = new String(charArray);
```

```
        System.out.println(reversePalindrome);  
    }  
}
```



A screenshot of a Windows command prompt window titled 'C:\Windows\System32\cmd.exe'. The window shows the following text:  
D:\VCA\java\work\type3>javac StringDemo.java  
D:\VCA\java\work\type3>java StringDemo  
Error: Could not find or load main class StringDemo  
D:\VCA\java\work\type3>java StringDemo  
doT saw I was toD  
D:\VCA\java\work\type3>

---

```
package basicoperations;  
public interface maths  
{  
    public void add();  
    public void sub();  
    public void mul();  
    public void div();  
}  
package basicoperations;  
import java.util.Scanner;
```

```
class student1 implements maths
{
    @Override
    public void add()
    {
        Scanner kb=new Scanner(System.in);
        System.out.println("enter any two integer value to
perform addition");
        int a=kb.nextInt();
        int b=kb.nextInt();
        int s=a+b;
        System.out.println("Addition is :" +s);
    }
    @Override
    public void sub()
    {
        Scanner kb=new Scanner(System.in);
        System.out.println("enter any two integer value to
perform subtraction");
        int a=kb.nextInt();
        int b=kb.nextInt();
        int s=a-b;
        System.out.println("Subtraction is :" +s);
    }
}
```

```
@Override  
public void mul()  
{  
    Scanner kb=new Scanner(System.in);  
    System.out.println("enter any two integer value to  
perform multiplication");  
    int a=kb.nextInt();  
    int b=kb.nextInt();  
    int s=a*b;  
    System.out.println("multiplication is :" +s);  
}  
  
@Override  
public void div()  
{  
    Scanner kb=new Scanner(System.in);  
    System.out.println("enter any two integer value to  
perform divition");  
    int a=kb.nextInt();  
    int b=kb.nextInt();  
    int s=a/b;  
    System.out.println("divition is :" +s);  
}  
  
public static void main(String args[])  
{
```

```
student1 std=new student1();  
std.add();  
std.sub();  
std.mul();  
std.div();  
}  
}
```

The screenshot shows a Windows Command Prompt window titled 'C:\Windows\System32\cmd.exe'. The command history is as follows:

```
C:\Windows\System32\cmd.exe  
D:\VICA\java\work\type3>javac -d . maths.java  
D:\VICA\java\work\type3>java basicoperations.student1  
ERROR: Could not find or load main class basicoperations.student1  
D:\VICA\java\work\type3>
```

The window has a dark background and light-colored text. It includes standard Windows UI elements like the taskbar at the bottom with icons for various applications.

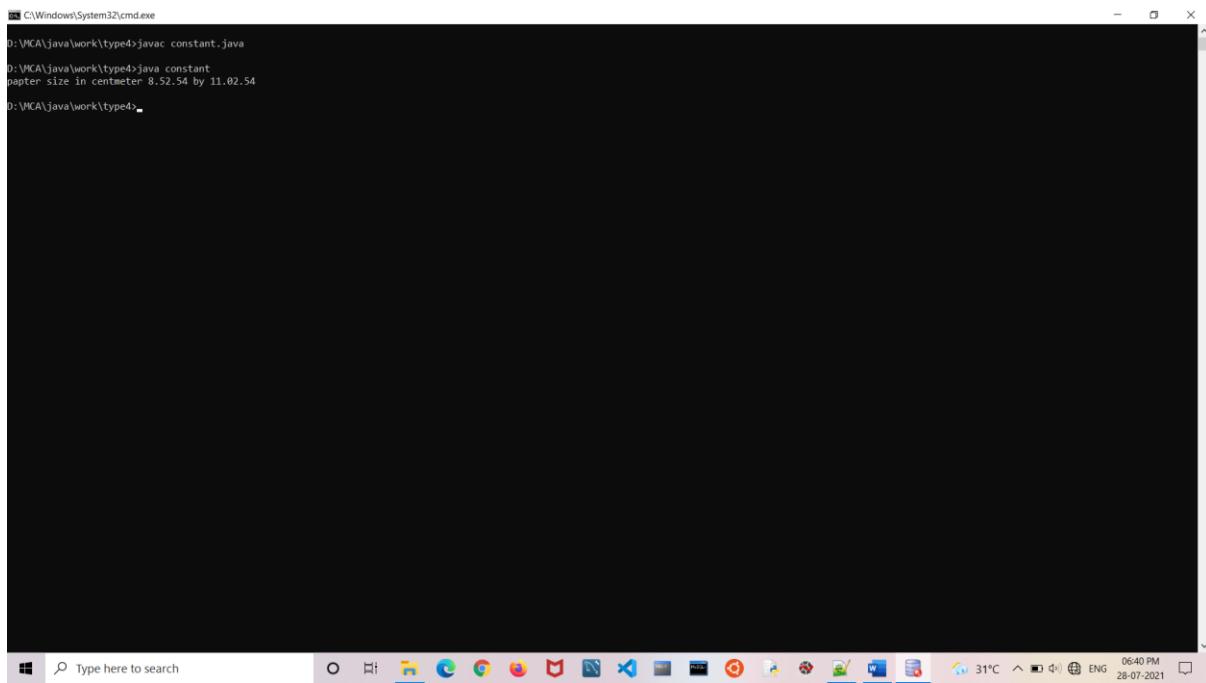
---

## Class Work – Package , Thread , Try and Catch and Throw

---

```
public class constant
{
    public static final double cm_per_inch=2.54;

    public static void main(String args[])
    {
        double papterwidth=8.5;
        double papterheight=11;
        System.out.println("papter size in centmeter "+
papterwidth + cm_per_inch + " by " + papterheight + cm_per_inch );
    }
}
```

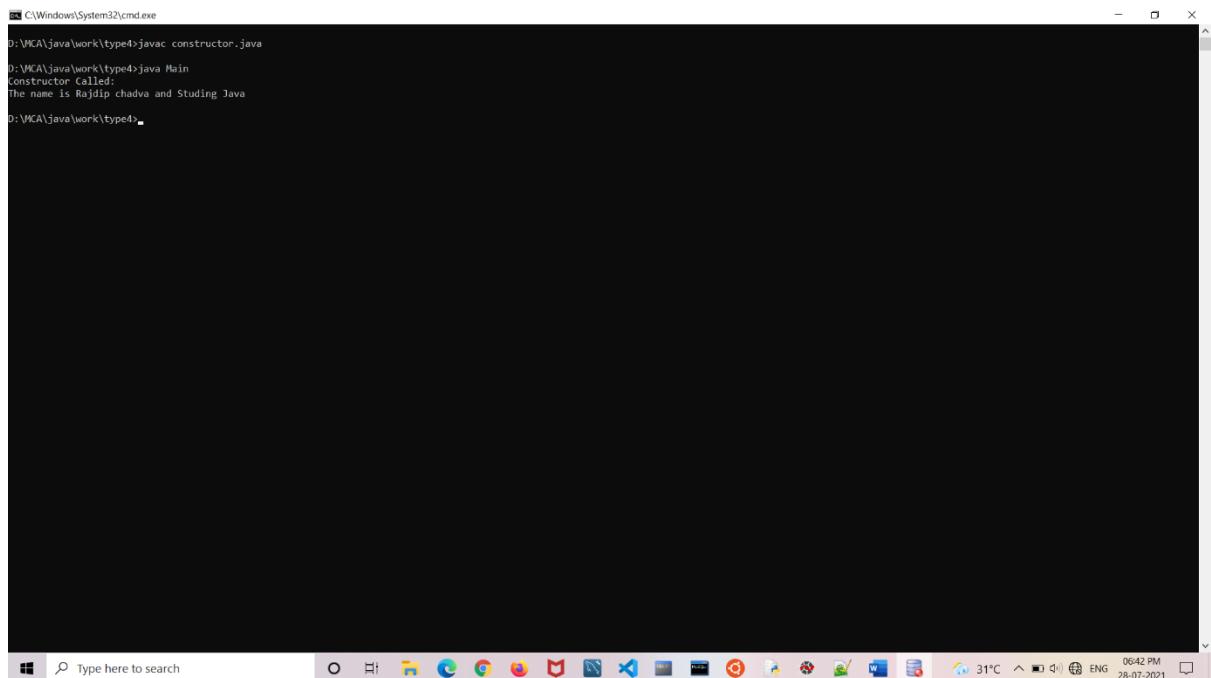


```
class Main
{
    private String name;

    // constructor
    Main() {
        System.out.println("Constructor Called:");
        name = "Rajdip chadva and Studing Java";
    }

    public static void main(String[] args) {
        // constructor is invoked while
        // creating an object of the Main class
    }
}
```

```
Main obj = new Main();  
System.out.println("The name is " + obj.name);  
}  
}
```



A screenshot of a Windows command prompt window titled 'C:\Windows\System32\cmd.exe'. The window shows the following text:  
D:\VCA\java\work\type4>javac constructor.java  
D:\VCA\java\work\type4>java Main  
constructor Called:  
The name is Rajdip chadva and Studing Java  
D:\VCA\java\work\type4>  
The window has a standard Windows title bar and taskbar at the bottom.

---

## class conversion

```
{  
public static void main(String args[]){  
    byte b;  
    int i=257;  
    double d=323.142;  
  
    System.out.println("conversion of int to byte ");
```

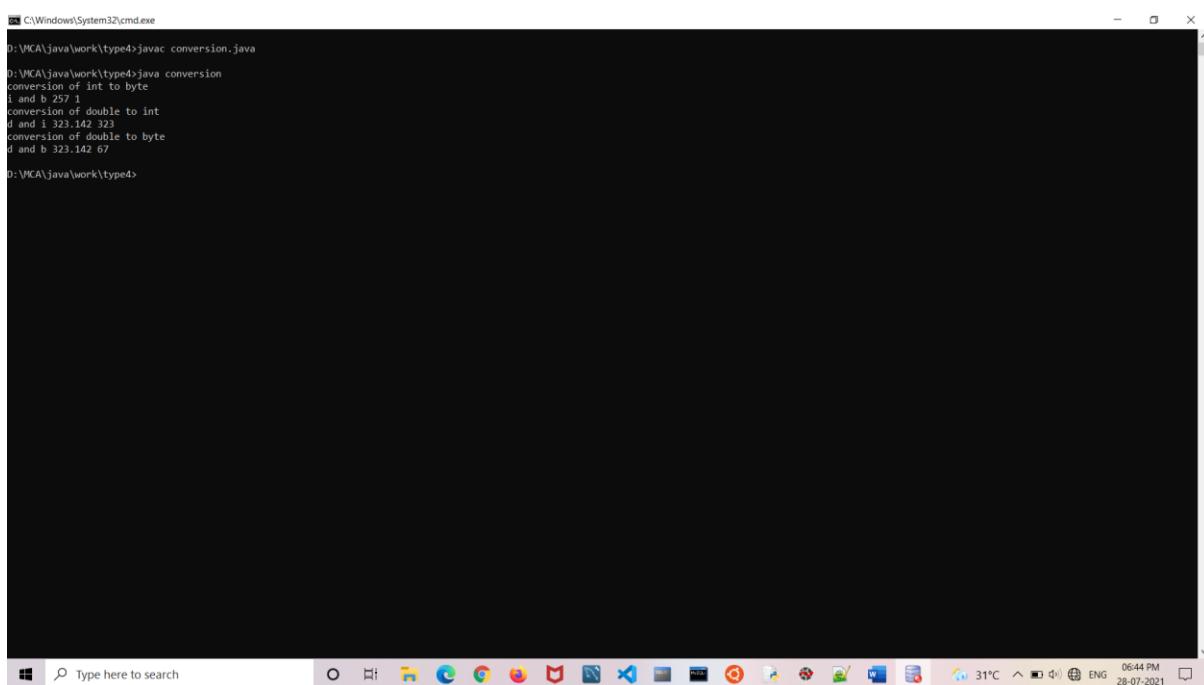
```
b=(byte)i;  
System.out.println("i and b "+i+" "+b);
```

```
System.out.println("conversion of double to int ");  
i=(int)d;  
System.out.println("d and i "+d+" "+i);
```

```
System.out.println("conversion of double to byte ");  
b=(byte)d;  
System.out.println("d and b "+d+" "+b);
```

```
}
```

```
}
```



The screenshot shows a Windows Command Prompt window titled 'C:\Windows\System32\cmd.exe'. The command 'javac conversion.java' is run, followed by 'java conversion'. The output displays two conversions: from double to int (outputting 257) and from double to byte (outputting 67). The desktop taskbar at the bottom shows various application icons.

```
C:\Windows\System32\cmd.exe  
D:\VICA\java\work\type4>javac conversion.java  
D:\VICA\java\work\type4>java conversion  
conversion of int to byte  
i and b 257  
conversion of double to int  
d and b 323.142.223  
conversion of double to byte  
d and b 323.142 67  
D:\VICA\java\work\type4>
```

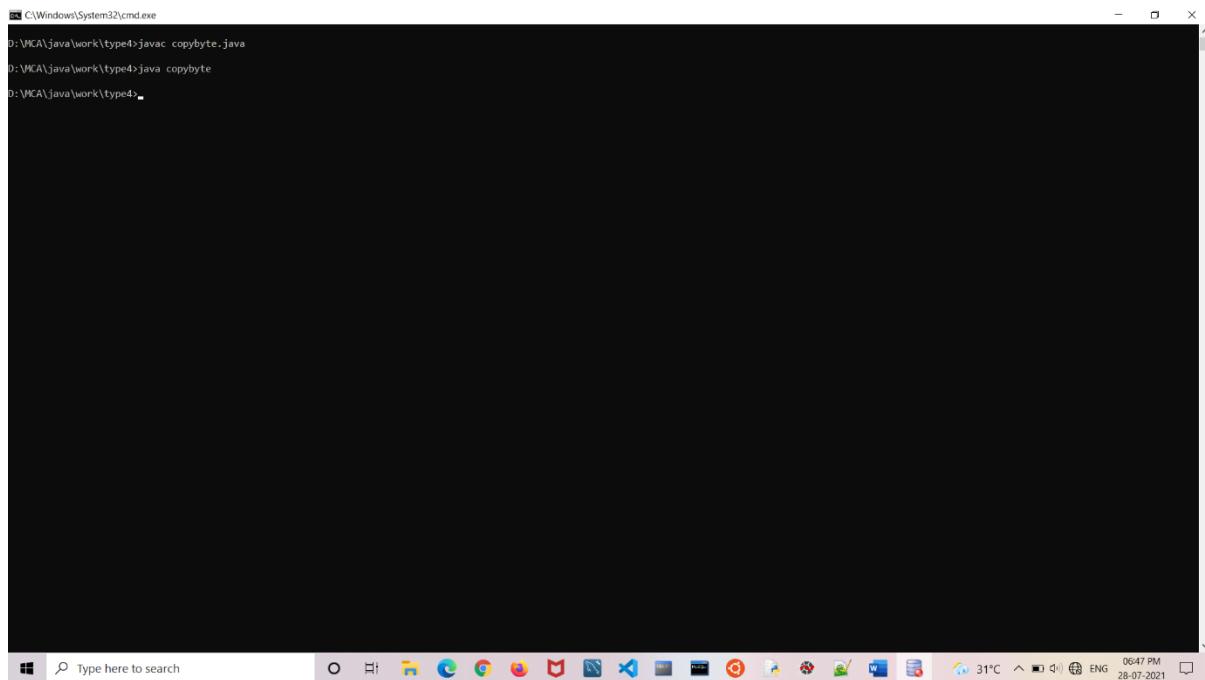
---

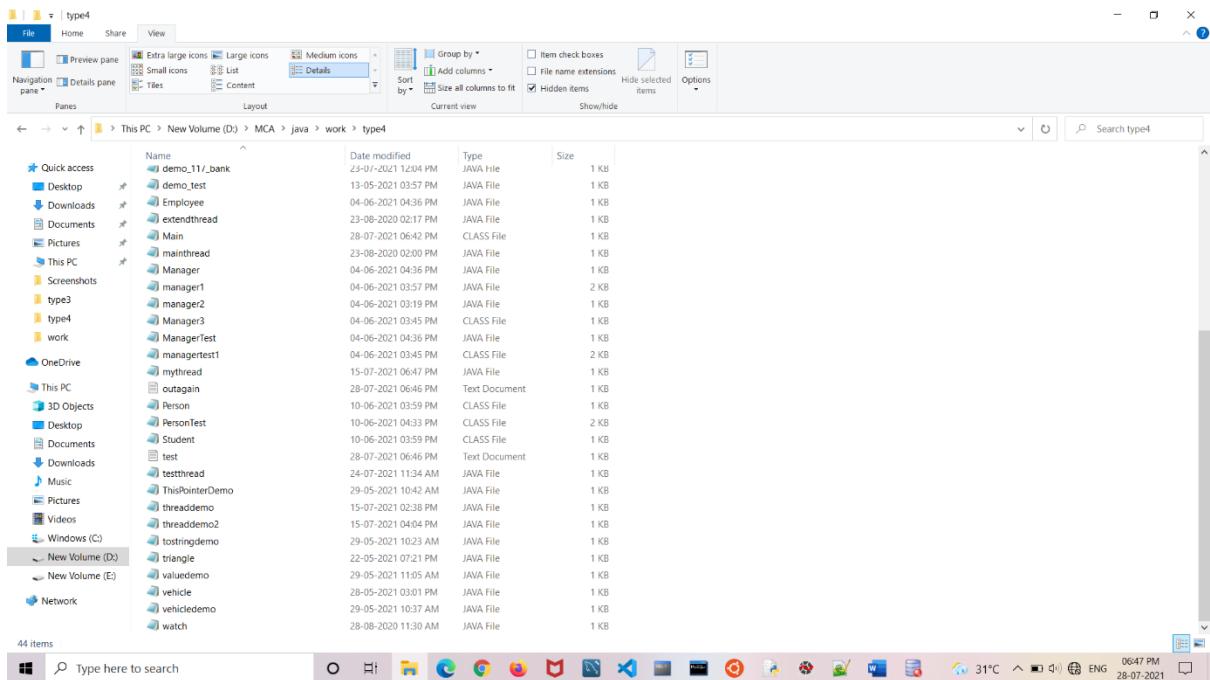
```
import java.io.FileInputStream;
import java.io.FileOutputStream;
import java.io.IOException;

public class copybyte
{
    public static void main(String args[]) throws IOException
    {
        FileInputStream in=null;
        FileOutputStream out=null;

        try
        {
            in=new FileInputStream("test.txt");
            out=new FileOutputStream("outagain.txt");
            int c;
            while ((c=in.read())!=-1)
            {
                out.write(c);
            }
        }
        finally
        {
            if(in != null)
```

```
{  
    in.close();  
}  
  
if(out!=null)  
{  
    out.close();  
}  
}  
}  
}
```





```
import java.io.FileReader;
```

```
import java.io.FileWriter;
```

```
import java.io.IOException;
```

```
public class copychar
```

```
{
```

```
    public static void main(String args[]) throws IOException
```

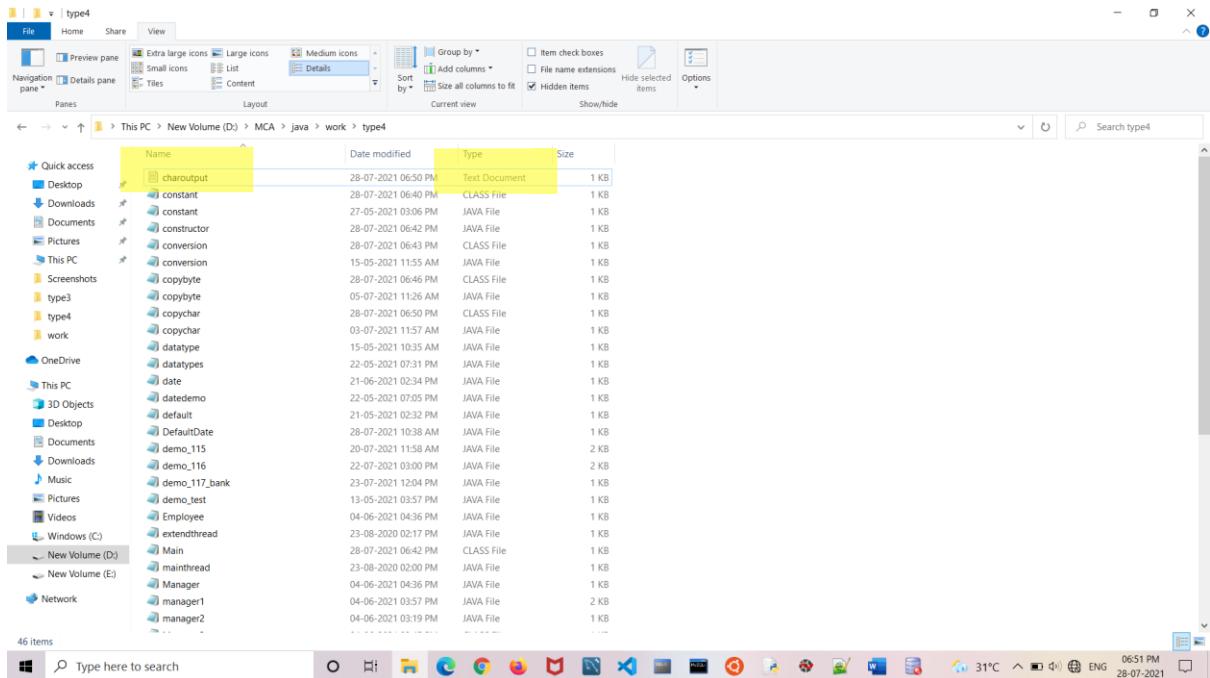
```
{
```

```
        FileReader instream=null;
```

```
        FileWriter outstream=null;
```

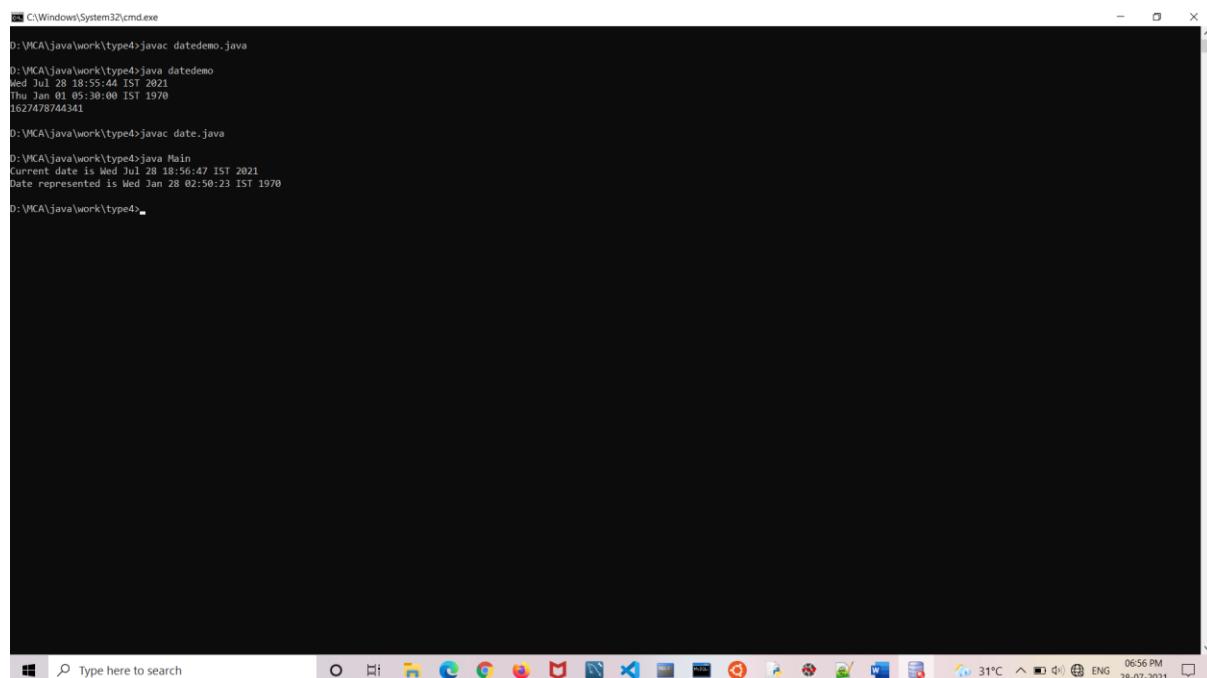
```
        try
```

```
{  
    instream=new FileReader("test.txt");  
    outstream=new FileWriter("charoutput.txt");  
    int c;  
    while ((c=instream.read())!=-1)  
    {  
        outstream.write(c);  
    }  
}  
finally  
{  
    if(instream != null)  
    {  
        instream.close();  
    }  
    if(outstream!=null)  
    {  
        outstream.close();  
    }  
}  
}
```



```
import java.util.*;  
  
class Main  
{  
  
    public static void main(String[] args)  
    {  
  
        Date d1 = new Date();  
  
        System.out.println("Current date is " + d1);  
  
        Date d2 = new Date(2323223232L);  
  
        System.out.println("Date represented is "+ d2 );  
  
    }  
  
}
```

```
import java.util.*;  
  
class datedemo  
{  
    public static void main(String args[])  
    {  
        Date currdate=new Date();  
        System.out.println(currdate);  
        Date epoch=new Date(0);  
        System.out.println(epoch);  
        long millis=System.currentTimeMillis();  
  
        System.out.println(millis);  
    }  
}
```



The screenshot shows a Windows Command Prompt window titled 'C:\Windows\System32\cmd.exe'. The command 'java datedemo' is run, displaying the current date and time. Then, 'java date.java' is run, showing the current date and time along with the date represented in milliseconds since January 1, 1970.

```
C:\Windows\System32\cmd.exe  
D:\VCA\java\work\type4>javac datedemo.java  
D:\VCA\java\work\type4>java datedemo  
Wed Jul 28 18:55:44 IST 2021  
Thu Jan 01 05:30:00 IST 1970  
1627478744341  
D:\VCA\java\work\type4>javac date.java  
D:\VCA\java\work\type4>java Main  
Current date is Wed Jul 28 18:56:47 IST 2021  
Date represented is Wed Jan 28 02:50:23 IST 1970  
D:\VCA\java\work\type4>
```

---

```
class ClassA extends Thread
{
    public void run()
    {
        System.out.println("start thread A ...");
        for(int i=1;i<=5;i++)
        {
            if(i==1)yield();
            System.out.println("from thread A: i- "+i);
        }
        System.out.println("...exit thread A");
    }
}

class ClassB extends Thread
{
    public void run()
    {
        System.out.println("start thread B...");
        for(int j=1;j<=5;j++)
        {
            System.out.println("from thread B: j="+j);
            if(j==2) stop();
        }
    }
}
```

```
    }

    System.out.println("...exit thread B");

}

}

class ClassC extends Thread

{

    public void run()

    {

        System.out.println("start thread C...");

        for(int k=1;k<=5;k++)

        {

            System.out.println("from thread C: k="+k);

            if(k==3)

            {

                try

                {

                    sleep(1000);

                }

                catch(Exception e){}

            }

        }

        System.out.println("...exit thread B");

    }

}
```

```
-----  
public class demo_115  
{  
    public static void main(String args[])  
    {  
        ClassA t1=new ClassA();  
        ClassB t2=new ClassB();  
        ClassC t3=new ClassC();  
        t1.start();  
        t2.start();  
        t3.start();  
        System.out.println("...end of execution");  
    }  
}  
}
```

The screenshot shows a Windows command prompt window titled 'C:\Windows\System32\cmd.exe'. The command 'java demo\_115' is run, resulting in the following output:

```
D:\VICA\java\work\type4>javac demo_115.java  
Note: demo_115.java uses or overrides a deprecated API.  
Note: Recompile with -Xlint:deprecation for details.  
D:\VICA\java\work\type4>java demo_115  
...end of execution  
exit thread B...  
start thread C...  
start thread A ...  
From thread B: j=1  
From thread B: j=2  
From thread A: i= 1  
From thread C: k=1  
From thread C: k=2  
From thread C: k=3  
From thread A: i= 2  
From thread A: i= 3  
From thread A: i= 4  
From thread A: i= 5  
...exit thread A  
From thread C: k=4  
From thread C: k=5  
...exit thread B
```

The window has a standard Windows title bar and taskbar at the bottom. The taskbar includes icons for various applications like File Explorer, Edge, and Task View.

---

```
class ClassA extends Thread
{
    public void run()
    {
        System.out.println("start thread A ...");
        for(int i=1;i<=5;i++)
        {
            if(i==1)yield();
            System.out.println("from thread A: i- "+i);
        }
        System.out.println("...exit thread A");
    }
}

class ClassB extends Thread
{
    public void run()
    {
        System.out.println("start thread B...");
        for(int j=1;j<=5;j++)
        {
            System.out.println("from thread B: j="+j);
            if(j==2) stop();
        }
    }
}
```

```
        System.out.println("...exit thread B");

    }

}

class ClassC extends Thread

{

    public void run()

    {

        System.out.println("start thread C...");

        for(int k=1;k<=5;k++)

        {

            System.out.println("from thread C: k="+k);

            if(k==3)

            {

                try

                {

                    sleep(1000);

                }

                catch(Exception e){}

            }

        }

        System.out.println("...exit thread B");

    }

}
```

---

```
public class demo_116
{
    public static void main(String args[])
    {
        ClassA t1=new ClassA();
        ClassB t2=new ClassB();
        ClassC t3=new ClassC();

        t3.setPriority(Thread.MAX_PRIORITY);
        t2.setPriority(t2.getPriority()+1);
        t1.setPriority(Thread.MIN_PRIORITY);

        t1.start();
        t2.start();
        t3.start();
        System.out.println("...end of execution");
    }
}
```

```
D:\VCA\Java\work\type4>javac demo_115.java
Note: demo_115.java uses or overrides a deprecated API.
Note: Recompile with -Xlint:deprecation for details.

D:\VCA\Java\work\type4>java demo_115
...end of execution
start thread B...
start thread C...
start thread A...
from thread B: j=1
from thread B: j=2
from thread A: i=1
from thread A: i=2
from thread C: k=1
from thread C: k=2
from thread C: k=3
from thread A: i= 2
from thread A: i= 3
from thread A: i= 4
from thread A: i= 5
...exit thread A
from thread C: k=4
from thread C: k=5
...exit thread B

D:\VCA\Java\work\type4>javac demo_116.java
Note: demo_116.java uses or overrides a deprecated API.
Note: Recompile with -Xlint:deprecation for details.

D:\VCA\Java\work\type4>java demo_116
...end of execution
start thread C...
start thread A...
start thread A ...
from thread B: j=1
from thread B: j=2
from thread A: i=1
from thread A: i=2
from thread A: i=3
from thread A: i=4
from thread A: i=5
...exit thread A
from thread C: k=1
from thread C: k=2
from thread C: k=3
from thread C: k=4
from thread C: k=5
...exit thread B

D:\VCA\Java\work\type4>
```

---

```
class newthread extends Thread{
```

```
    newthread(){
        super("Demo Thread");
        System.out.println("Child thread: " + this);
        start();
    }
```

```
public void run(){
```

```
    try{
        for(int i=5;i>0;i--){
            System.out.println("Child Thread: " + i);
            Thread.sleep(500);
        }
    }
```

```
        }

    }catch(InterruptedException e){

        System.out.println("Child interrupted");

    }

    System.out.println("Exiting child thread");

}

}

class extendthread{

    public static void main(String args[]){

        new newthread();

        try{

            for(int i=5;i>0;i--){

                System.out.println("Main Thread: " + i);

                Thread.sleep(1000);

            }

        }catch(InterruptedException e){

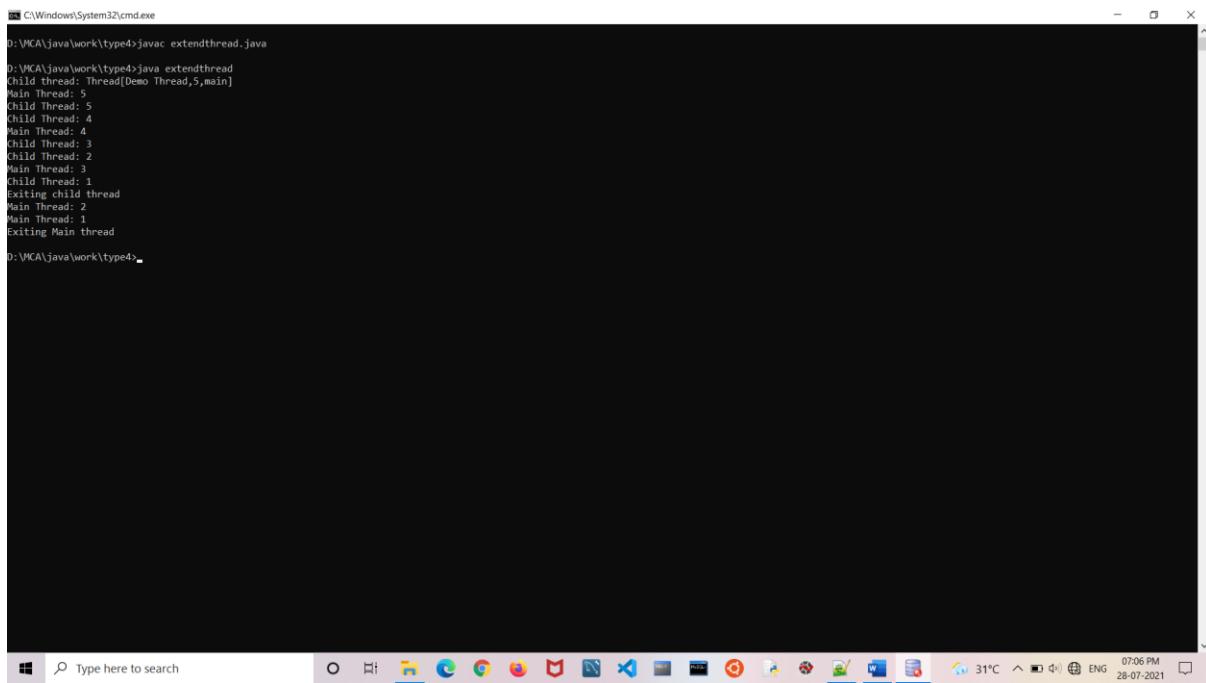
            System.out.println("Main interrupted");

        }

        System.out.println("Exiting Main thread");

    }

}
```



```
C:\Windows\System32\cmd.exe
D:\VCA\java\work\type4>javac extendthread.java
D:\VCA\java\work\type4>java extendthread
Child thread: Thread[Demo Thread,5,main]
Main Thread: 5
Child Thread: 5
Child Thread: 4
Main Thread: 4
Child Thread: 3
Child Thread: 2
Main Thread: 3
Child Thread: 1
Exiting child thread
Main Thread: 2
Main Thread: 1
Exiting Main thread
D:\VCA\java\work\type4>
```

---

```
class mainthread{
```

```
    public static void main(String arg[]){
        Thread t = Thread.currentThread();
        System.out.println("Current thread=" + t);

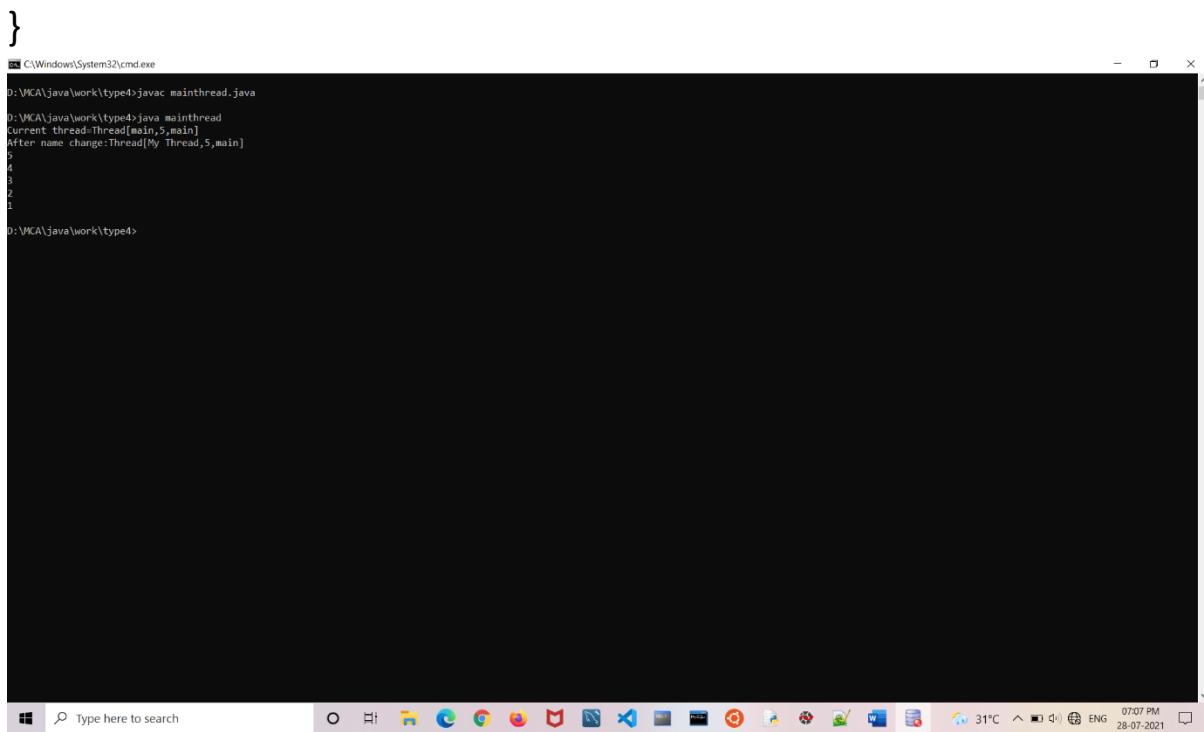
        t.setName("My Thread");

        System.out.println("After name change:" + t);
```

```
    try{
```

```
        for(int i=5;i>0;i--){
            System.out.println(i);
            Thread.sleep(1000);
        }
    }
```

```
    }  
}  
    }catch(InterruptedException e){  
        System.out.println("Main Thread Interrupted");  
  
    }  
  
}
```



A screenshot of a Windows command prompt window titled 'cmd.exe'. The window shows the following text:  
C:\Windows\System32\cmd.exe  
D:\VCA\java\work\type4>javac mainthread.java  
D:\VCA\java\work\type4>java mainthread  
Current thread:Thread[main,5,main]  
After name change:Thread[My Thread,5,main]  
5  
4  
3  
2  
1  
D:\VCA\java\work\type4>

---

```
-----  
class mythread implements Runnable  
{  
    String thrdname;  
    mythread(String name)
```

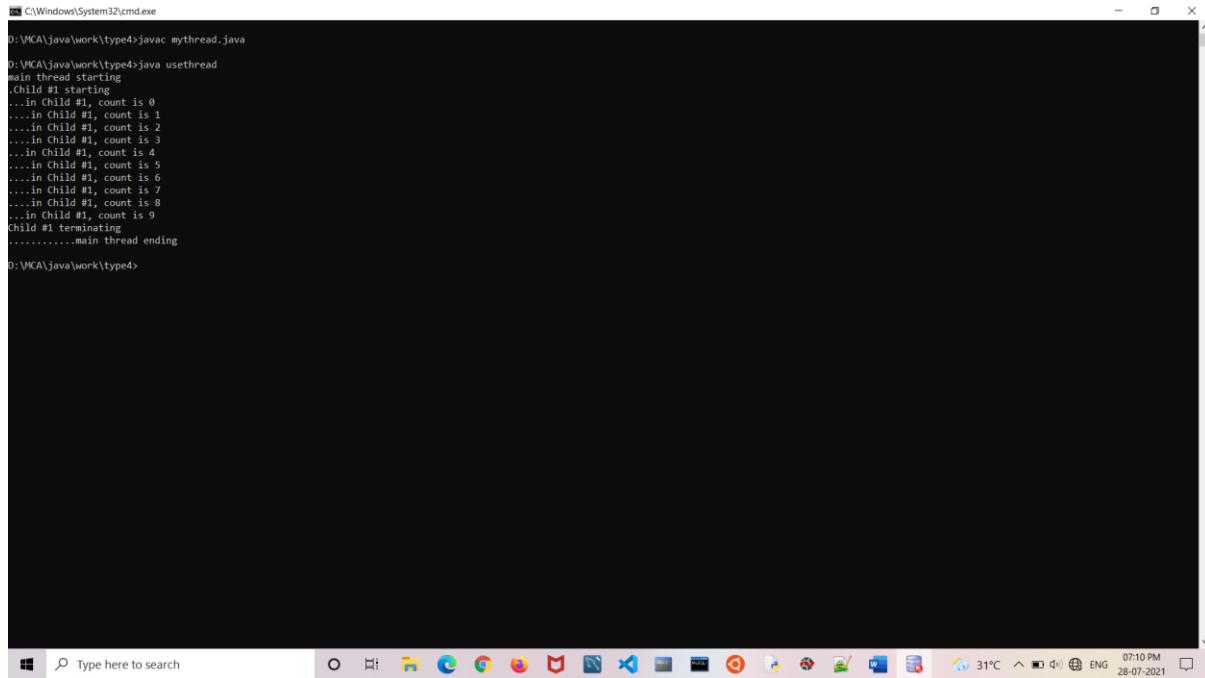
```
{  
    thrdname=name;  
}  
  
public void run()  
{  
    System.out.println(thrdname + " starting ");  
    try  
    {  
        for(int count=0;count<10;count++)  
        {  
            Thread.sleep(400);  
            System.out.println("in "+thrdname+", count is  
"+count);  
        }  
    }  
    catch(InterruptedException exc)  
    {  
        System.out.println(thrdname+"interrupted.");  
    }  
    System.out.println(thrdname+" terminating");  
}  
}  
  
class usethread
```

```
{  
    public static void main(String args[])  
    {  
        System.out.println("main thread starting");  
  
        mythread mt=new mythread("Child #1");  
  
        Thread newThrd = new Thread(mt);  
  
        newThrd.start();  
  
        for(int i=0;i<50;i++)  
        {  
            System.out.print(".");  
            try  
            {  
                Thread.sleep(100);  
            }  
            catch(InterruptedException exc)  
            {  
                System.out.println("main thread  
interrupted.");  
            }  
        }  
    }  
}
```

```
        System.out.println("main thread ending");

    }

}
```



A screenshot of a Windows command prompt window titled 'C:\Windows\System32\cmd.exe'. The window shows the following text:

```
D:\MCA\java\work\type4>javac mythread.java
D:\MCA\java\work\type4>java usethread
main thread starting
Child #1 starting
....in Child #1, count is 0
....in Child #1, count is 1
....in Child #1, count is 2
....in Child #1, count is 3
....in Child #1, count is 4
....in Child #1, count is 5
....in Child #1, count is 6
....in Child #1, count is 7
....in Child #1, count is 8
....in Child #1, count is 9
Child #1 terminating
.....main thread ending
D:\MCA\java\work\type4>
```

The window has a standard Windows title bar and taskbar at the bottom. The taskbar includes icons for various applications like File Explorer, Edge, and File Explorer.

---

```
//demonstration of this pointer
//java can have more than one class
```

```
class Point3D
{
    double x;
    double y;
    double z;

    Point3D(double x,double y,double z)
```

```
{  
    this.x=x;  
    this.y=y;  
    this.z=z;  
}  
  
}  
  
class ThisPointerDemo  
{  
    public static void main(String args[]){  
        {  
            Point3D p = new Point3D(2.3,1.1,5.6);  
  
            System.out.println("x is : " + p.x);  
            System.out.println("y is : " + p.y);  
            System.out.println("z is : " + p.z);  
        }  
    }  
}
```

A screenshot of a Windows command prompt window titled 'C:\Windows\System32\cmd.exe'. The window shows the following text:

```
D:\VMCA\java\work\type4>javac ThisPointerDemo.java
D:\VMCA\java\work\type4>java ThisPointerDemo
x is : 2.3
y is : 1.1
z is : 5.6
D:\VMCA\java\work\type4>
```

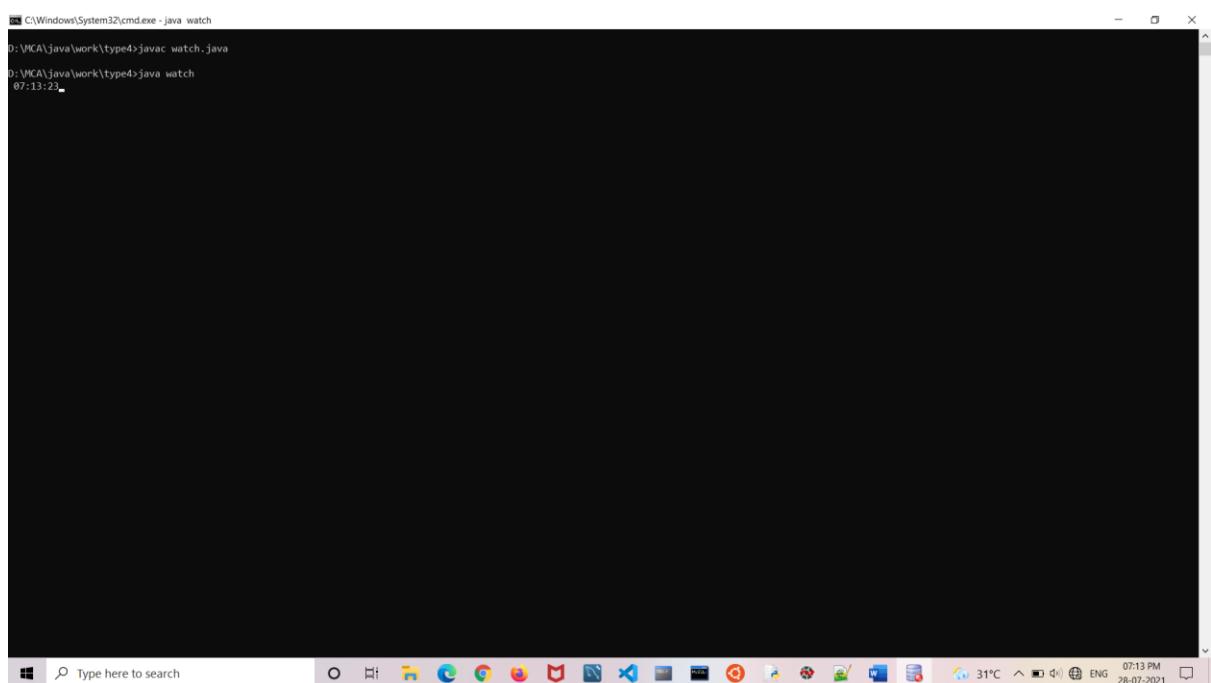
The command prompt is located at the bottom of the screen, showing the taskbar with various icons and system status information.

---

```
import java.text.DateFormat;
import java.text.SimpleDateFormat;
import java.util.Calendar;
import java.util.Date;

class watch {
    public static void main(String[] args) {
        while (true) {
            Date date = Calendar.getInstance().getTime();
            DateFormat formatter = new SimpleDateFormat("hh:mm:ss");
            String today = formatter.format(date);
            System.out.print("\r " + today);
        }
    }
}
```

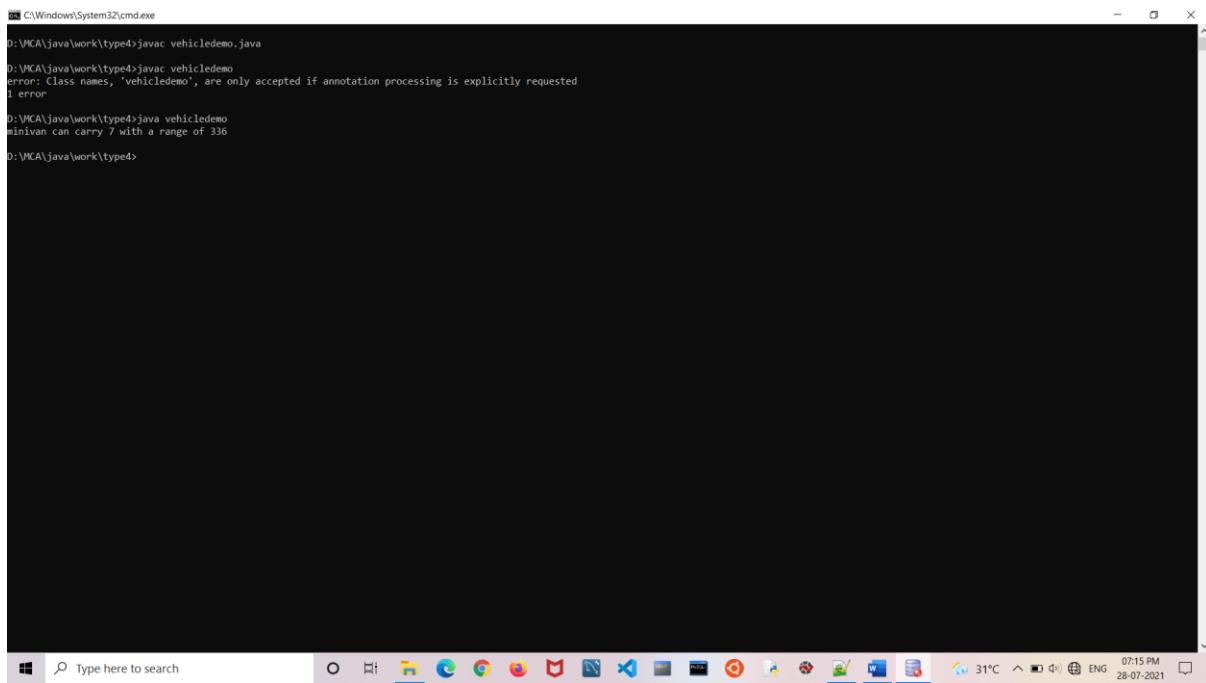
```
try {  
    Thread.sleep(1000);  
}  
catch (InterruptedException e) {  
    e.printStackTrace();  
}  
}  
}  
}
```



---

```
/* A program that uses the vechicle class.  
call this file vehicledemo.java  
*/  
class vechicle{
```

```
int passengers;//number of passengers  
int fulecap;//fuel capacity in gallons  
int mpg;// fuel consumption in miles per gallon  
}  
  
//this class declares an object of type vehicle  
class vehicledemo{  
    public static void main(String args[]){  
        {  
            vechicle minivan=new vechicle();  
            int range;  
            //assign values to fields in minivan  
            minivan.passengers=7;  
            minivan.fulecap=16;  
            minivan.mpg=21;  
            //computer the range assuming a full tank of gas  
            range=minivan.fulecap * minivan.mpg;  
            System.out.println("minivan can carry " + minivan.passengers + "  
with a range of "+ range);  
        }  
    }  
}
```



```
C:\Windows\System32\cmd.exe
D:\VCA\java\work\type4>javac vehicledemo.java
D:\VCA\java\work\type4>java vehicledemo
error: Class names, 'vehicledemo', are only accepted if annotation processing is explicitly requested
1 error
D:\VCA\java\work\type4>java vehicledemo
minivan can carry 7 with a range of 336
D:\VCA\java\work\type4>
```

---

```
class vehicle
```

```
{  
    private int passengers;  
    private int fuelcap;  
    private int mpg;
```

```
    vehicle(int p,int f,int m)
```

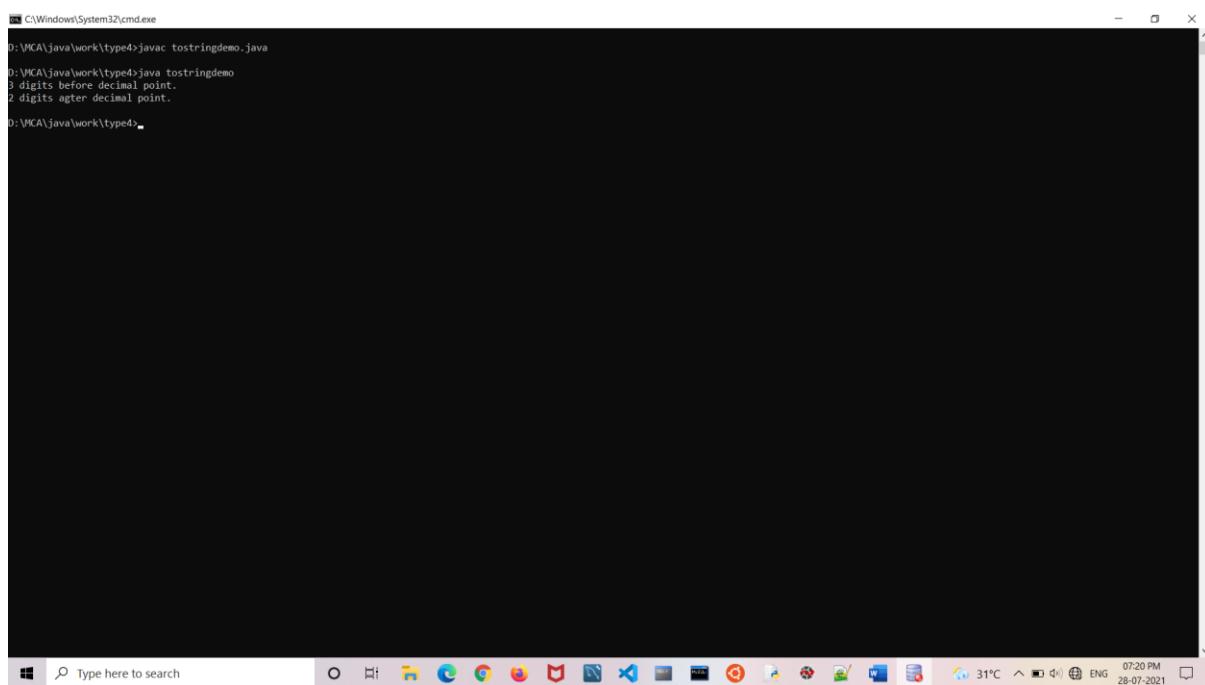
```
{  
    passengers=p;  
    fuelcap=f;  
    mpg=m;
```

```
}  
int range()
```

```
{  
    return mpg*fuelcap;  
}  
  
double fuelneeded(int miles)  
{  
    return() miles/mpg;  
}  
  
int getpassengers()  
{  
    return passengers;  
}  
  
void setpassengers(int p)  
{  
  
}  
  
int getFuelcap()  
{  
  
}  
}  
  
public class tostringdemo  
{
```

```
public static void main(String args[])
{
    double d=858.25;
    String s=Double.toString(d);

    int dot=s.indexOf('.');
    System.out.println(dot+" digits "+"before decimal
point.");
    System.out.println((s.length()-dot-1)+" digits agter
decimal point.");
}
```



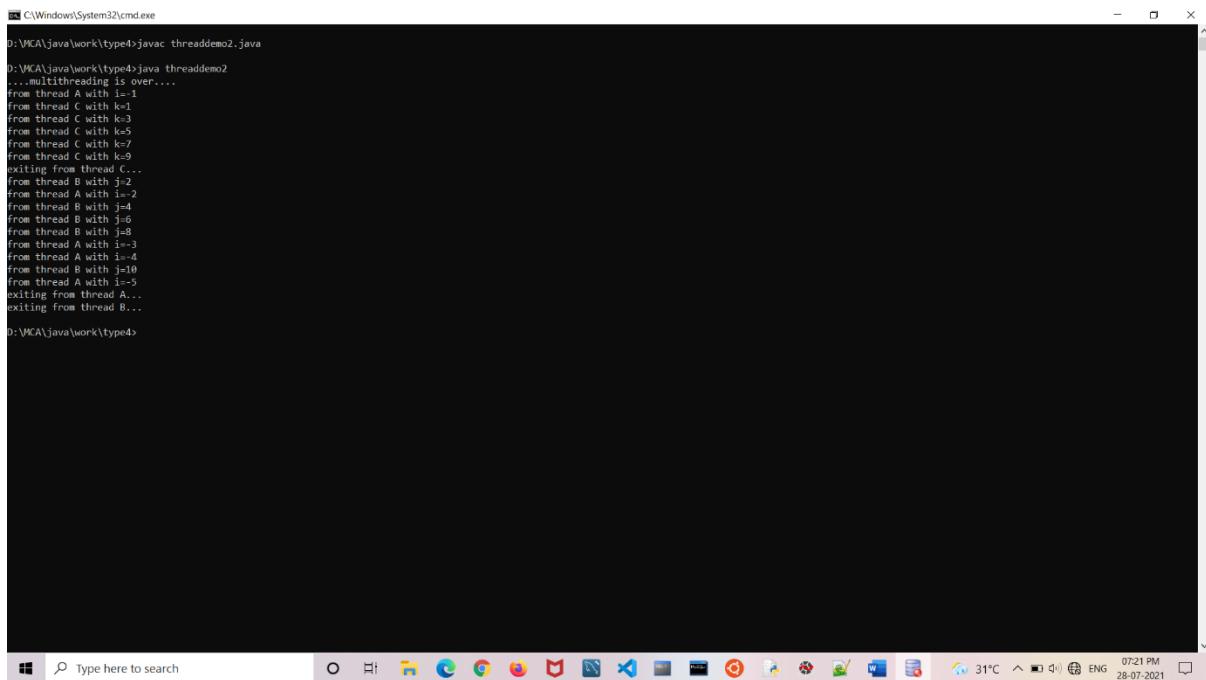
```
C:\Windows\System32\cmd.exe
D:\VICA\java\work\type4>javac tostringdemo.java
D:\VICA\java\work\type4>java tostringdemo
3 digits before decimal point.
2 digits agter decimal point.
D:\VICA\java\work\type4>
```

```
class threadA extends Thread
{
    public void run()
    {
        for(int i=1;i<=5;i++)
        {
            System.out.println("from thread A with i=" + -1*i);
        }
        System.out.println("exiting from thread A...");
    }
}

class threadB extends Thread
{
    public void run()
    {
        for(int j=1;j<=5;j++)
        {
            System.out.println("from thread B with j=" + 2*j);
        }
        System.out.println("exiting from thread B...");
    }
}

class threadC extends Thread
```

```
{  
    public void run()  
    {  
        for(int k=1;k<=5;k++)  
        {  
            System.out.println("from thread C with k="+ (2*k-  
1));  
        }  
        System.out.println("exiting from thread C...");  
    }  
}  
  
class threaddemo2  
{  
    public static void main(String args[])  
    {  
        threadA a=new threadA();  
        threadB b=new threadB();  
        threadC c=new threadC();  
        a.start();  
        b.start();  
        c.start();  
        System.out.println("....multithreading is over....");  
    }  
}
```



```
C:\Windows\System32\cmd.exe
D:\VCA\java\work\type4>javac threaddemo2.java
D:\VCA\java\work\type4>java threaddemo2
.....
from thread A with i=1
from thread C with k=1
from thread C with k=3
from thread C with k=5
from thread C with k=7
from thread C with k=9
exiting from thread C...
from thread B with j=1
from thread B with j=2
from thread B with j=4
from thread B with j=6
from thread B with j=8
from thread A with i=3
from thread A with i=4
from thread B with j=10
from thread A with i=5
exiting from thread A...
exiting from thread B...
D:\VCA\java\work\type4>
```

---

```
class myclass extends Thread
```

```
{
```

```
    public void run()
```

```
{
```

```
    for(int i=0;i<10;i++)
```

```
{
```

```
        System.out.println(Thread.currentThread().getId()+"
```

```
value "+i);
```

```
}
```

```
    try
```

```
{
```

```
        Thread.sleep(0);
```

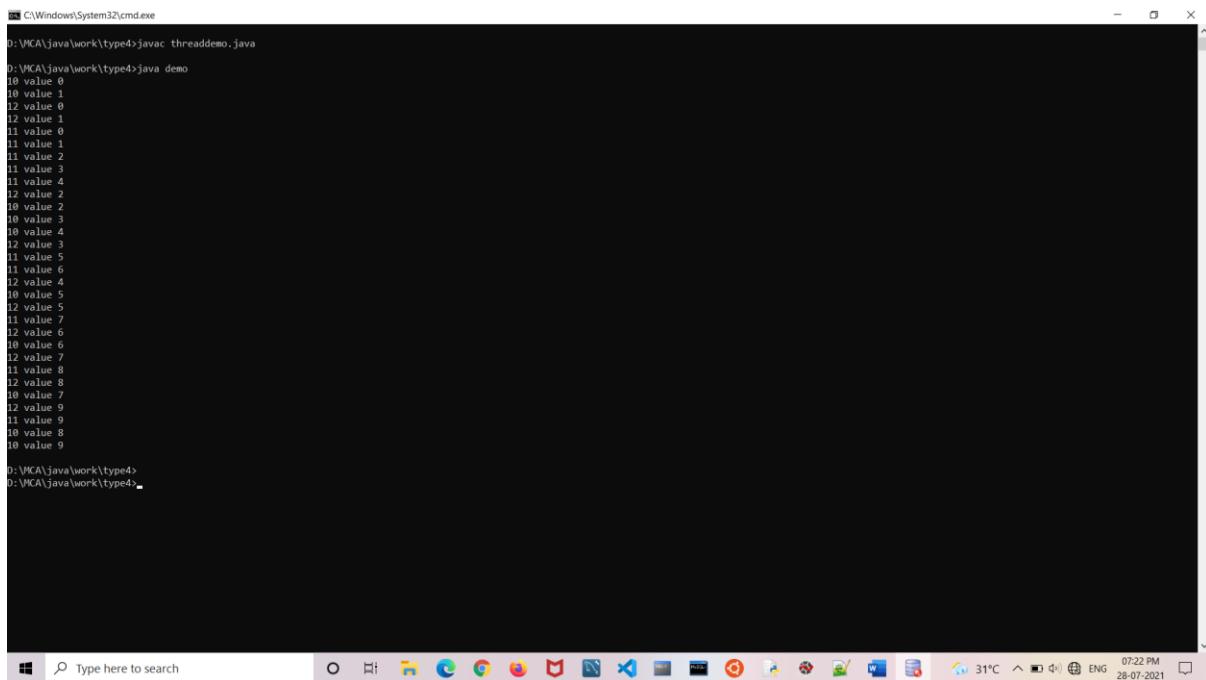
```
}
```

```
        catch(InterruptedException e)
        {
            e.printStackTrace();
        }
    }

class demo
{
    public static void main(String args[])
    {
        myclass m1=new myclass();
        m1.start();

        myclass m2=new myclass();
        m2.start();

        myclass m3=new myclass();
        m3.start();
    }
}
```



```
C:\Windows\System32\cmd.exe
D:\VCA\java\work\type4>javac threaddemo.java
D:\VCA\java\work\type4>java demo
10 value 0
10 value 1
12 value 0
12 value 1
11 value 0
11 value 1
11 value 2
11 value 3
11 value 4
12 value 2
10 value 2
10 value 3
10 value 4
12 value 3
12 value 5
11 value 5
11 value 6
12 value 4
10 value 5
12 value 5
11 value 7
12 value 6
10 value 6
12 value 7
11 value 8
12 value 8
10 value 7
12 value 9
11 value 9
10 value 8
10 value 9
D:\VCA\java\work\type4>
```

---

package inheritance;

```
import java.util.Date;
import java.util.GregorianCalendar;
```

```
public class Employee
```

```
{  
    private String name;  
    private double salary;  
    private Date hireDay;
```

```
    public Employee(String n, double s, int year, int month, int day)
```

```
{
```

```
name = n;  
salary = s;  
  
GregorianCalendar calendar = new GregorianCalendar(year, month  
-1, day);  
  
hireDay = calendar.getTime();  
}  
  
  
  
public String getName()  
{  
    return name;  
}  
  
public double getSalary()  
{  
    return salary;  
}  
  
  
  
public Date getHireDay()  
{  
    return hireDay;  
}  
  
  
  
public void raiseSalary(double byPercent)  
{  
    double raise = salary * byPercent / 100;
```

```
salary += raise;  
}  
}  
  
package inheritance;  
public class Manager extends Employee  
{  
    private double bonus;  
  
    public Manager(String n, double s, int year, int month, int day)  
    {  
        super(n, s, year, month, day);  
        bonus = 0;  
    }  
  
    public double getSalary()  
    {  
        double baseSalary = super.getSalary();  
        return baseSalary + bonus;  
    }  
  
    public void setBonus(double b)  
    {  
        bonus = b;  
    }
```

```
 }  
 }
```

```
package inheritance;
```

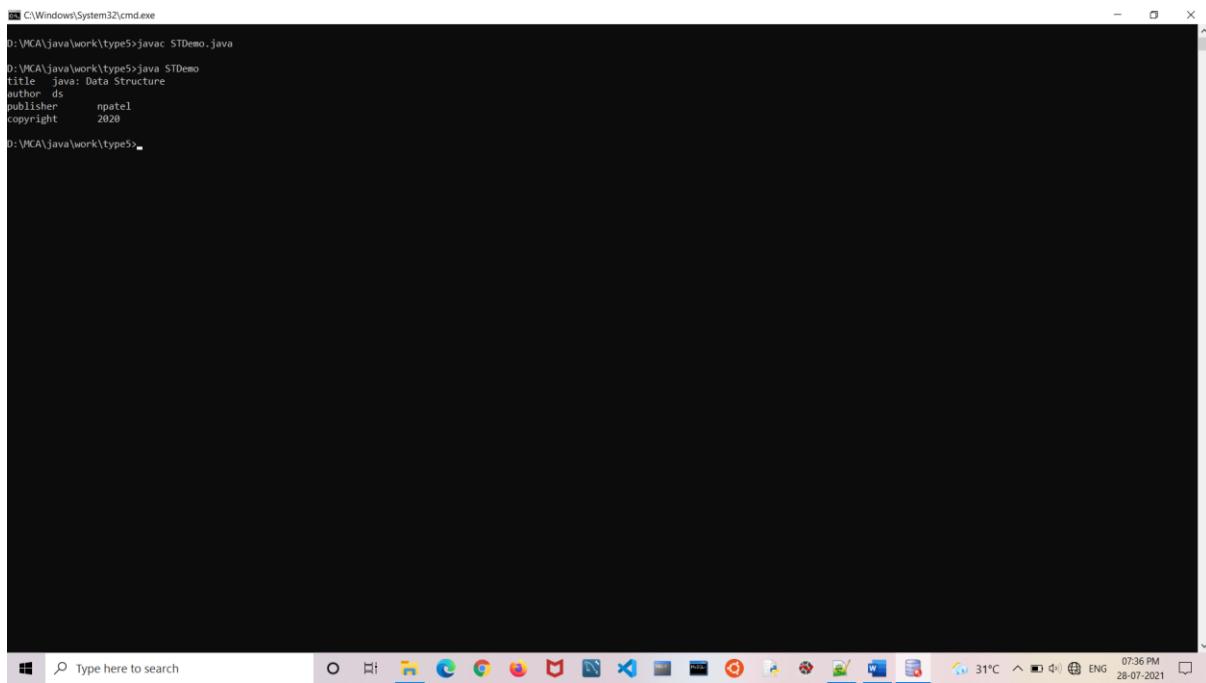
```
public class ManagerTest  
{  
    public static void main(String[] args)  
    {  
        // construct a Manager object  
        Manager boss = new Manager("Carl Cracker", 80000, 1987, 12,  
        15);  
        boss.setBonus(5000);  
        Employee[] staff = new Employee[3];  
        // fill the staff array with Manager and Employee objects  
        staff[0] = boss;  
        staff[1] = new Employee("Harry Hacker", 50000, 1989, 10, 1);  
        staff[2] = new Employee("Tommy Tester", 40000, 1990, 3, 15);  
        // print out information about all Employee objects  
        for (Employee e : staff)  
            System.out.println("name=" + e.getName() + ",salary=" +  
            e.getSalary());  
    }  
}
```

---

## Class Work – Synchronization , Exception , LocalDate and LocalTime , StringTokenizer

---

```
import java.util.StringTokenizer;  
  
class STDemo  
{  
    static String in="title=java: Data  
Structure;"+ "author=ds;"+ "publisher=npatel;"+ "copyright=2020";  
  
    public static void main(String args[])  
    {  
        StringTokenizer st=new StringTokenizer(in,"=");  
        while(st.hasMoreTokens())  
        {  
            String key=st.nextToken();  
            String val=st.nextToken();  
            System.out.println(key+"\t"+val);  
        }  
    }  
}
```



---

```
import java.io.*;
class ReadLines1
{
    public static void main(String args[]) throws IOException
    {
        BufferedReader br=new BufferedReader (new
InputStreamReader(System.in));
        String str;
        System.out.println("Enter lines of text.");
        System.out.println("Enter 'stop' to Exit");
        str="a";
        while ((!str.equals ("stop")) || (!str.equals ("STOP")))
    }
```

```
{  
    str=br.readLine();  
    System.out.println(str);  
}  
}  
}
```

```
C:\Windows\System32\cmd.exe - java ReadLines1  
D:\VICA\java\work\type5>javac ReadLines1.java  
D:\VICA\java\work\type5>java ReadLines1  
Enter lines of text.  
press 'stop' to Exit  
rajidip  
rajidip  
rajidipchavda  
rajidipchavda  
stop  
stop
```

---

```
class Q
```

```
{  
    int n;  
    boolean flag=false;  
    synchronized void put(int n)  
    {  
        if(flag)
```

```
{  
    try  
    {  
        wait();  
    }  
    catch(InterruptedException e)  
    { };  
}  
this.n=n;  
System.out.println("Produce :" + n);  
flag=true;  
notify();  
}  
  
synchronized int get()  
{  
    if(! flag)  
    {  
        try  
        {  
            wait();  
        }  
        catch(InterruptedException e)  
        { };  
    }  
}
```

```
    }

}

class Consumer implements Runnable

{

    Q q;

    Consumer (Q q )

    {

        this.q =q;

        new Thread (this).start( );

    }

    public void run()

    {

        while(true)

        {

            q.get();

        }

    }

}

class public_120

{

    public static void main(String args[])

    {

        Q q=new Q();

        new Producer(q);

    }

}
```

```
    new Consumer(q);

}

-----
import java.io.IOException;

public class jumbalename implements Runnable
{
    public jumbalename(String firstname,String secendname,long delay)
    {
        this.firstname=firstname;
        this.secendname=secendname;
        aWhile=delay;
    }

    public void run()
    {
        try
        {
            while(true)
            {
                System.out.println(firstname);
                Thread.sleep(aWhile);
            }
        }
    }
}
```

```
        System.out.println(secendname+"\n");
    }
}

catch(InterruptedException e)
{
    system.out.println(firstname+secendname+e);
}

}

public static void main(String args[])
{
    Thread first =new Thread(new
jumbalename("rajdip","chavda",200L));

    Thread secend =new Thread(new
jumbalename("abhiraj","makwana",300L));

    Thread third =new Thread(new
jumbalename("prajval","rai",500L));

    first.setDaemon(true);
    secend.setDaemon(true);
    third.setDaemon(true);

    System.out.println("press enter when you have had
enough...\n");

    first.start();
}
```

```
secend.start();  
third.start  
  
try  
{  
    System.in.read();  
    System.out.println("Enter pressed...\n");  
}  
}  
}
```

---

```
import java.time.LocalDate;  
import java.time.LocalTime;  
import java.time.Period;  
import java.time.temporal.TemporalAdjusters;  
  
public class dataAPlutility  
{  
    public static void main(String args[])  
    {  
        LocalDate today=LocalDate.now();  
        System.out.println("year "+today.getYear()+" is leap Year  
? "+ today.isLeapYear());
```

```
System.out.println("Today is before  
01/01/2015?"+today.isBefore(LocalDate.of(2015,1,1)));
```

```
System.out.println("current  
time="+today.atTime(LocalTime.now()));
```

```
System.out.println("10 days after today will be  
"+today.plusDays(10));
```

```
System.out.println("3 weeks after today will be  
"+today.plusDays(3));
```

```
System.out.println("20 months after today will be  
"+today.plusDays(20));
```

```
System.out.println("10 days before today will be  
"+today.minusDays(10));
```

```
System.out.println("3 weeks before today will be  
"+today.minusDays(3));
```

```
System.out.println("20 months before today will be  
"+today.minusDays(20));
```

```
System.out.println("first date of this month  
:"+today.with(TemporalAdjusters.firstDayOfMonth()));
```

```
LocalDate.lastDayOfYear =  
today.with(TemporalAdjusters.lastDayOfYear());
```

```
System.out.println("1st date of this  
year="+lastDayOfYear);
```

```

        Period Period = today.until(lastDayOfYear);

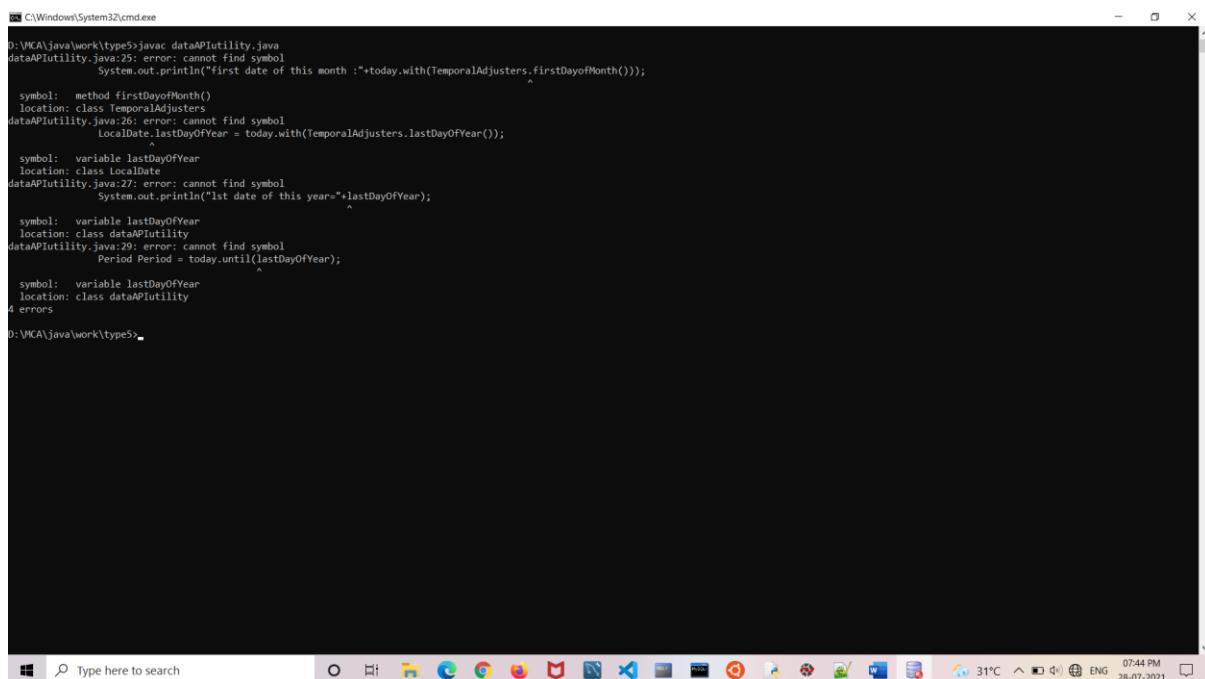
        System.out.println("period format "+Period);

        System.out.println("months remainnig in the year
"+Period.getMonths());

    }

}

```



The screenshot shows a Windows Command Prompt window titled 'C:\Windows\System32\cmd.exe'. The command entered is 'D:\VKP\java\work\type5>javac dataAPIUtility.java'. The output shows four errors related to symbols like 'firstDayOfMonth', 'lastDayOfYear', and 'Period' which cannot be found. The errors are:

```

D:\VKP\java\work\type5>javac dataAPIUtility.java
dataAPIUtility.java:25: error: cannot find symbol
        System.out.println("First date of this month :" +today.with(TemporalAdjusters.firstDayOfMonth()));
                                         ^
symbol:   method firstDayOfMonth()
location: class TemporalAdjusters
dataAPIUtility.java:26: error: cannot find symbol
        LocalDate lastDayOfYear = today.with(TemporalAdjusters.lastDayOfYear());
                                         ^
symbol:   variable lastDayOfYear
location: class LocalDate
dataAPIUtility.java:27: error: cannot find symbol
        System.out.println("1st date of this year=" +lastDayOfYear);
                                         ^
symbol:   variable lastDayOfYear
location: class dataAPIUtility
dataAPIUtility.java:29: error: cannot find symbol
        Period Period = today.until(lastDayOfYear);
                                         ^
symbol:   variable lastDayOfYear
location: class dataAPIUtility
4 errors
D:\VKP\java\work\type5>

```

---

```
class NonIntResultException extends Exception
```

```
{
    int n;
    int d;
    NonIntResultException(int i,int j)
```

```
{  
    n=i;  
    d=j;  
}  
  
public String toString()  
{  
    return "Result :of " +n+ " / "+d+" is non-integer ";  
}  
}  
  
class customeExceptiondemo  
{  
    public static void main(String args[])  
    {  
        int numer[]={4,8,15,32,54,127,256,512};  
        int denom[]={2,0,4,4,0,8};  
        for(int i=0;i<numer.length;i++)  
        {  
            try  
            {  
                if((numer[i]%2) != 0)  
                {  
                    throw new  
NonIntResultException(numer[i],denom[i]);  
                }  
            }  
        }  
    }  
}
```

```
        System.out.println(numer[i] + " / "+denom[i] + " is "
+ numer[i]/denom[i]);
    }
    catch( ArithmeticException exc)
    {
        System.out.println("Can't divide by Zero !");
    }
    catch(ArrayIndexOutOfBoundsException exc)
    {
        System.out.println("No maching elements found !");
    }
    catch(NonIntResultException exc)
    {
        System.out.println(exc);
    }
}
}
```

A screenshot of a Windows command prompt window titled 'C:\Windows\System32\cmd.exe'. The command 'javac customexception.java' is run, followed by 'java customExceptiondemo'. The output shows several division operations: 15 / 2 (result 7), 32 / 4 (result 8), 127 / 8 (result 15), and 127 / 0 (error: Can't divide by Zero!). A search bar at the bottom says 'Type here to search' and shows a taskbar with various icons.

```
D:\VCA\java\work\type5>javac customexception.java
D:\VCA\java\work\type5>java customExceptiondemo
15 / 2 is 7
Result :of 15 / 4 is non-integer
32 / 4 is 8
Can't divide by Zero !
Result :of 127 / 8 is non-integer
No matching elements found !
No matching elements found !
D:\VCA\java\work\type5>
```

---

```
class Account
```

```
{
```

```
    public int balance;
```

```
    public int accountNo;
```

```
    void displayBalance()
```

```
{
```

```
        System.out.println(" Account Number "+ accountNo + "  
Balance "+ balance);
```

```
}
```

```
synchronized void deposit(int amount)
```

```
{
```

```
    balance=balance+amount;
```

```
        System.out.println(amount+ " is deposited ");
        displayBalance();
    }

    synchronized void withdraw(int amount)
    {
        balance=balance-amount;
        System.out.println(amount+ " is withdrawn ");
        displayBalance();
    }

}

class TransactionDeposit implements Runnable
{
    int amount;
    Account accountX;
    TransactionDeposit(Account x,int amount)
    {
        accountX=x;
        this.amount=amount;
        new Thread(this).start();
    }

    public void run()
    {
        accountX.deposit(amount);
    }
}
```

```
}

class TransactionWithdraw implements Runnable

{

    int amount;

    Account accountY;

    TransactionWithdraw(Account y,int amount)

    {

        accountY=y;

        this.amount=amount;

        new Thread(this).start();

    }

    public void run()

    {

        accountY.deposit(amount);

    }

}

class SynchronizedDemo

{

    public static void main(String[] args) {

        Account Abc=new Account();

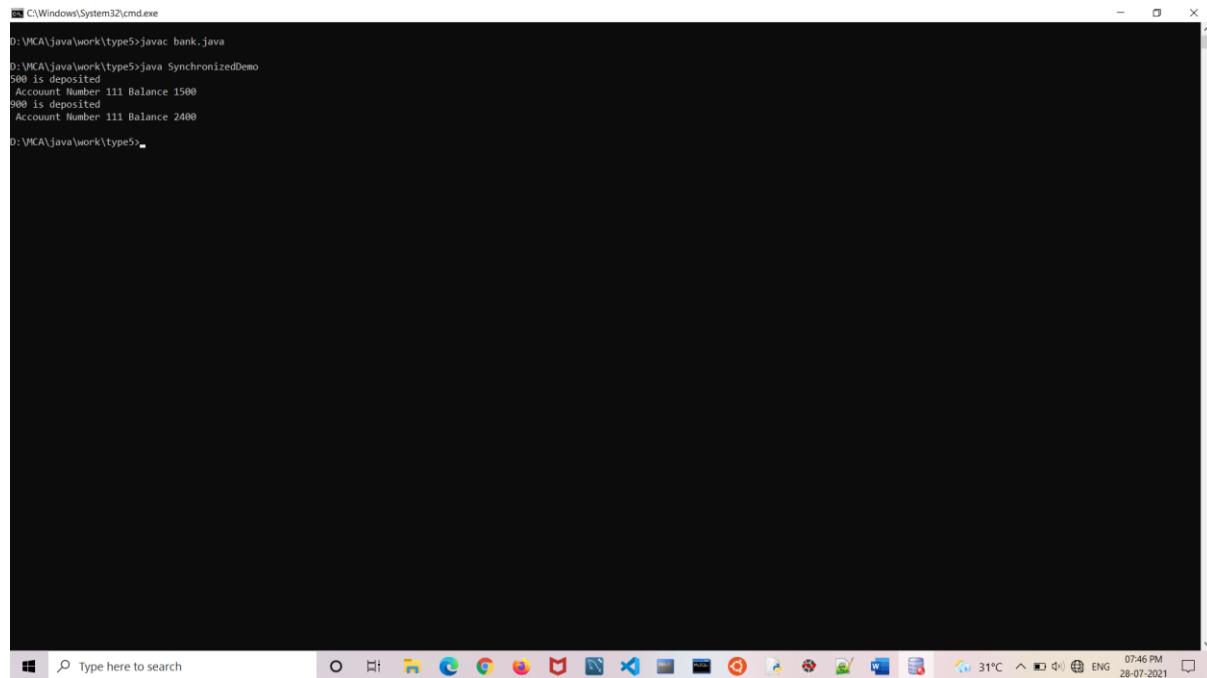
        Abc.balance=1000;

        Abc.accountNo=111;

        TransactionDeposit t1;

        TransactionWithdraw t2;
```

```
t1=new TransactionDeposit(Abc,500);  
t2=new TransactionWithdraw(Abc,900);  
}  
}
```



A screenshot of a Windows command prompt window titled 'C:\Windows\System32\cmd.exe'. The window contains the following text:

```
D:\VCA\java\work\type5>javac bank.java  
D:\VCA\java\work\type5>java SynchronizedDemo  
500 is deposited  
Account Number 111 Balance 1500  
900 is deposited  
Account Number 111 Balance 2400
```

The window has a standard Windows title bar and taskbar at the bottom. The taskbar includes icons for various applications like File Explorer, Edge, and Task View.

