**Ordinary:**

**01. Write a program to convert to convert temperature among different scales.**

**Source Code:**

**import** java.util.Scanner;

public class App {

public static void main(String[] args) {

try{

Scanner input=new Scanner(System.in);

double c,k,f;

System.out.print("Enter temperature in Farenheit: ");

f=input.nextDouble();

if(f<0.0)

throw new MyException("F is negative");

c=(f-32)\*(5.0/9.0);

k=((f-32)\*(5.0/9.0))+273.15;

System.out.println("Celcius: "+c+" Kelvin: "+k);

}

catch(MyException e){

System.out.println("Caught my exception");

System.out.println(e.getMessage());

}

}

}

public class MyException extends Exception {

public MyException(String message){

super(message);

}

}

**Sample Input & Output:**

Enter temperature in Farenheit: 95

Celcius: 35.0 Kelvin: 308.15

**02. Calculate yearly basis interest for banking**

**Source Code:**

import java.util.Scanner;

public class App {

public static void main(String[] args) {

Scanner input=new Scanner(System.*in*);

int year,period;

double amount, value, inrate,principal,inrate1;

System.*out*.print("Enter principal: ");

principal=input.nextDouble();

System.*out*.print("Enter period: ");

period=input.nextInt();

System.*out*.print("Enter Interest rate: ");

inrate=input.nextDouble();

amount=principal;

year=0;

while(year<=period){

System.*out*.printf("%2d %8.2f\n",year, amount);

value=amount+inrate\*amount;

year=year+1;

amount=value;

}

}

}

**Sample Input & Output:**

Enter principal: 5000

Enter period: 10

Enter Interest rate: 0.11

0 5000.00

1 5550.00

2 6160.50

3 6838.16

4 7590.35

5 8425.29

6 9352.07

7 10380.80

8 11522.69

9 12790.18

10 14197.10**03. Check a number is prime or not**

**Source Code:**

import java.util.Scanner;

public class App {

public static void main(String[] args) {

try{

Scanner input=new Scanner(System.in);

int a,i,count;

count=0;

System.out.printf("Enter number: ");

a=input.nextInt();

if(a<0)

throw new MyException("Number is negative");

for(i=2;i<=a/2;i++)

{

if(a%i==0)

{

count++;

break;

}

}

if(count==0&&a!=1)

System.out.printf("Number is prime");

else

System.out.printf("Number is not prime");

}

catch(MyException e){

System.out.println("Caught my exception");

System.out.println(e.getMessage());

}

}

}

**Sample Input & Output:**

Enter number: -2

Caught my exception

Number is negative**04. Prime number upto n**

**Source Code:**

import java.util.Scanner;

public class PrimeUptoN {

public static void main(String[] args) {

try{

int i,j,count,n,sum=0,x=0;

Scanner input=new Scanner(System.*in*);

System.*out*.print("Enter N: ");

n=input.nextInt();

if(n<0.0)

throw new MyException("N is negative");

for(i=1;i<=n;i++)

{

count=0;

for(j=2;j<=i/2;j++)

{

if(i%j==0)

{

count++;

break;

}

}

if(count==0&&i!=1)

{

x++;

sum=sum+i;

System.*out*.print(i+"\t");

}

}

System.*out*.println();

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

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

}

catch(MyException e){

System.*out*.println("Caught my exception");

System.*out*.println(e.getMessage());

}

}

}

**Sample Input & Output:**

Enter N: 17

2 3 5 7 11 13 17

Total: 7

Sum: 58

**05. Check a number is odd or even**

**Source Code:**

import java.util.Scanner;

public class OddNumber {

public static void main(String[] args) {

try{

Scanner input=new Scanner(System.*in*);

System.*out*.print("Enter a number: ");

int x=input.nextInt();

if(x<0.0)

throw new MyException("x is negative");

Demo d=new Demo(x);

d.odd();

}

catch(MyException e){

System.*out*.println("Caught my exception");

System.*out*.println(e.getMessage());

}

}

}

public class Demo {

int a;

Demo(int x)

{

a=x;

}

void odd()

{

if(a%2!=0)

System.*out*.println("Number is odd");

else

System.*out*.println("Number is not odd");

}

}

public class MyException extends Exception{

public MyException(String message){

super(message);

}

}

**Sample Input & Output:**

Enter a number: -5

Caught my exception

x is negative

**06. Odd number upto n**

**Source Code:**

import java.util.Scanner;

public class OddSum {

public static void main(String[] args) {

Scanner input=new Scanner(System.*in*);

System.*out*.print("Enter n: ");

int n=input.nextInt();

int i,sum=0;

for(i=1;i<=n;i++)

{

if(i%2!=0)

sum = sum+i;

}

System.*out*.println("Sum of first odd numbers upto n is: "+sum);

}

}

**Sample Input & Output:**

Enter n: 9

Sum of first odd numbers upto n is: 25

**07. Even number upto n**

**Source Code:**

import java.util.Scanner;

public class EvenSum {

public static void main(String[] args) {

Scanner input=new Scanner(System.*in*);

System.*out*.print("Enter a number: ");

int n=input.nextInt();int i,sum=0;

for(i=1;i<=n;i++)

{

if(i%2==0)

sum = sum+i;

}

System.*out*.println("Sum of first even numbers upto n is: "+sum);

}

}

**Sample Input & Output:**

Enter a number: 4

Sum of first even numbers upto n is: 6

**08. Fibonacci series**

**Source Code:**

import java.util.Scanner;

public class Fibonacci {

public static void main(String[] args) {

int i,fib,fib1,fib2,n;

Scanner input=new Scanner(System.*in*);

fib1=0;

fib2=1;

System.*out*.print("Enter N: ");

n=input.nextInt();

for(i=1;i<=n;i++)

{

fib=fib1+fib2;

System.*out*.print(fib+"\t");

fib2=fib1;

fib1=fib;

}

}

}

**Sample Input & Output:**

Enter N: 9

1 2 3 5 8 13 21 34

**09. Summation upto n**

**Source Code:**

**import** java.util.Scanner;

**public** **class** App {

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

Scanner input=**new** Scanner(System.***in***);

**int** n,sum;

System.***out***.print("Enter number n: ");

n=input.nextInt();

sum=(n\*(n+1))/2;

System.***out***.print("Sum: "+sum);

}

}

**Sample Input & Output:**

Enter number n: 5

Sum: 15

**10. Swapping two numbers using third variable.**

**Source Code:**

import java.util.Scanner;

public class App {

public static void main(String[] args) {

Scanner input=new Scanner(System.*in*);

int a,b,temp;

System.*out*.println("Enter value of a and b: ");

a=input.nextInt();

b=input.nextInt();

temp=a;

a=b;

b=temp;

System.*out*.println("After swapping a: "+a+" b: "+b);

}

}

**Sample Input & Output:**

Enter value of a and b:

12 34

After swapping a: 34 b: 12

**11. Swapping two numbers without using third variable.**

**Source Code:**

import java.util.Scanner;

public class App {

public static void main(String[] args) {

Scanner input=new Scanner(System.*in*);

int a,b;

System.*out*.println("Enter value of a and b: ");

a=input.nextInt();

b=input.nextInt();

a=a+b;

b=a-b;

a=a-b;

System.*out*.println("After swapping a: "+a+" b: "+b);

}

}

**Sample Input & Output:**

Enter value of a and b:

23 45

After swapping a: 45 b: 23

**12(a) . Calculate the value of permutation**

**Source Code:**

**import** java.util.Scanner;

**public** **class** App {

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

**try**{

Scanner input=**new** Scanner(System.***in***);

**int** n,k,p;

System.***out***.printf("Enter value of n and k: ");

n=input.nextInt();

k=input.nextInt();

**if**(n<k)

**throw** **new** MyException("n is smaller than k");

p=*factorial*(n)/*factorial*(n-k);

System.***out***.printf("%dP%d : %d",n,k,p);

}

**catch**(MyException e){

System.***out***.println("Caught my exception");

System.***out***.println(e.getMessage());

}

**catch**(ArithmeticException e){

System.***out***.println("Math error!");

}

}

**public** **static** **int** factorial(**int** n)

{

**if**(n==1)

**return** 1;

**else**

**return** (n\**factorial*(n-1));

}

}

**public** **class** MyException **extends** Exception {

MyException(String message){

**super**(message);

}

}

**Sample Input & Output:**

Enter value of n and k: 2 7

Caught my exception

n is smaller than k

**12(b). Calculate the value of combination**

**Source Code:**

**import** java.util.Scanner;

**public** **class** App {

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

**try**{

Scanner input=**new** Scanner(System.***in***);

**int** n,r,c;

System.***out***.printf("Enter value of n and r: ");

n=input.nextInt();

r=input.nextInt();

**if**(n<r)

**throw** **new** MyException("n is smaller than r");

c=*factorial*(n)/(*factorial*(r)\**factorial*(n-r));

System.***out***.printf("%dC%d : %d",n,r,c);

}

**catch**(MyException e){

System.***out***.println("Caught my exception");

System.***out***.println(e.getMessage());

}

**catch**(ArithmeticException e){

System.***out***.println("Math error!");

}

}

**public** **static** **int** factorial(**int** n)

{

**if**(n==1)

**return** 1;

**else**

**return** (n\**factorial*(n-1));

}

}

**public** **class** MyException **extends** Exception{

**public** MyException(String message){

**super**(message);

}

}

**Sample Input & Output:**

Enter value of n and k: 7 3

7P3 : 210

**12(c). Calculate the value of lcd**

**Source Code:**

import java.util.Scanner;

public class App {

public static void main(String[] args) {

Scanner input=new Scanner(System.*in*);

int a,b,l;

System.*out*.printf("Enter the two numbers: ");

a=input.nextInt();

b=input.nextInt();

if(a>b)

l = *lcd*(a,b);

else

l = *lcd*(b,a);

System.*out*.printf("LCD of %d and %d: %d",a,b,l);

}

public static int lcd(int a,int b)

{

int temp = a;

while(true)

{

if(temp % b == 0 && temp % a == 0)

break;

temp++;

}

return temp;

}

}

**Sample Input & Output:**

Enter the two numbers: 5 7

LCD of 5 and 7: 35

**12(d). Calculate the value of gcd**

**Source Code:**

import java.util.Scanner;

public class App {

public static void main(String[] args) {

Scanner input=new Scanner(System.*in*);

int a, b, result;

System.*out*.printf("Enter the two numbers: ");

a=input.nextInt();

b=input.nextInt();

result = *gcd*(a, b);

System.*out*.printf("The GCD of %d and %d is: %d", a, b, result);

}

public static int gcd(int a, int b)

{

while (a != b)

{

if (a > b)

{

return *gcd*(a - b, b);

}

else

{

return *gcd*(a, b - a);

}

}

return a;

}

}

**Sample Input &Output:**

Enter the two numbers: 2 3

The GCD of 2 and 3 is: 1

**13. Write a program to calculate gpa for given number.**

**Source Code:**

**import** java.util.Scanner;

**public** **class** GpaCalculation {

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

**try**{

Scanner input=**new** Scanner(System.***in***);

**int** number;

System.***out***.print("Enter your number: ");

number=input.nextInt();

**if**(number<0.0)

**throw** **new** MyException("Invalid input");

**if**(number>=80)

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

**else** **if**(number>=75 && number<80)

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

**else** **if**(number>=70 && number<75)

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

**else** **if**(number>=65 && number<70)

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

**else** **if**(number>=60 && number<65)

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

**else** **if**(number>=55 && number<60)

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

**else** **if**(number>=50 && number<55)

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

**else** **if**(number>=45 && number<50)

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

**else** **if**(number>=40 && number<45)

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

**else**

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

}

**catch**(MyException e){

System.***out***.println("Caught my exception");

System.***out***.println(e.getMessage());

}

}

}

**public** **class** MyException **extends** Exception{

**public** MyException(String message){

**super**(message);

}

}

**Sample Input & Output:**

Enter your number: 70

A-

**14. Check a given string is palindrome or not**

**Source Code:**

import java.util.Scanner;

public class App {

public static void main(String [] args){

Scanner input=new Scanner(System.*in*);

String s;

System.*out*.print("Enter String: ");

s=input.nextLine();

if(*isPalindrome*(s)){

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

} else {

System.*out*.println("Not Palindrome");

}

}

public static boolean isPalindrome(String original){

try{

int i = original.length()-1;

int j=0;

while(i > j){

if(original.charAt(i) != original.charAt(j)){

return false;

}

i--;

j++;

}

}

catch(StringIndexOutOfBoundsException e){

System.*out*.println("Index out of bound for character");

}

return true;

}

}

**Sample Input & Output:**

Enter String: annn

Not Palindrome

**Array:**

**01. One ,two dimensional array representation**

**Source Code:**

**public** **class** App {

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

**int** a[]=**new** **int** [5];

**int** b[][]=**new** **int** [5][5];

**for**(**int** i=0;i<5;i++){

a[i]=i+1;

}

System.***out***.println("One Dimensional array: ");

**for**(**int** i=0;i<5;i++){

System.***out***.print(a[i]+"\t");

}

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

**for**(**int** i=0;i<5;i++){

**for**(**int** j=0;j<5;j++){

b[i][j]=i+1;

}

}

System.***out***.println("Two Dimensional array: ");

**for**(**int** i=0;i<5;i++){

**for**(**int** j=0;j<5;j++){

System.***out***.print(b[i][j]+"\t");

}

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

}

}

}

**Sample Input & Output:**

One Dimensional array:

1 2 3 4 5

Two Dimensional array:

1 1 1 1 1

2 2 2 2 2

3 3 3 3 3

4 4 4 4 4

5 5 5 5 5

**02. Matrix addition**

**Source Code:**

**import** java.util.Scanner;

**public** **class** Run {

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

**try**{

**int** [][]a =**new** **int**[10][10];

**int** [][]b =**new** **int**[10][10];

**int** [][]c =**new** **int**[10][10];

**int** row,col,i,j;

Scanner input = **new** Scanner(System.***in***);

System.***out***.printf("Enter Number of Rows: ");

row=input.nextInt();

System.***out***.printf("Enter Number of Column: ");

col=input.nextInt();

System.***out***.printf("Enter First Matrix:\n");

**for**(i=0;i<row;i++)

**for**(j=0;j<col;j++)

a[i][j]=input.nextInt();

System.***out***.printf("Enter Second Matrix:\n");

**for**(i=0;i<row;i++)

**for**(j=0;j<col;j++)

b[i][j]=input.nextInt();

System.***out***.printf("First Matrix:---\n");

**for**(i=0;i<row;i++)

{

**for**(j=0;j<col;j++)

System.***out***.printf("%d ",a[i][j]);

System.***out***.printf("\n");

}

System.***out***.printf("Second Matrix:\n");

**for**(i=0;i<row;i++)

{

**for**(j=0;j<col;j++)

System.***out***.printf("%d ",b[i][j]);

System.***out***.printf("\n");

}

**for**(i=0;i<row;i++)

**for**(j=0;j<col;j++)

c[i][j]=a[i][j]+b[i][j];

System.***out***.printf("Addition of Matrix:\n");

**for**(i=0;i<row;i++)

{

**for**(j=0;j<col;j++)

System.***out***.printf("%d ",c[i][j]);

System.***out***.printf("\n");

}

}

**catch**(ArrayIndexOutOfBoundsException e){

System.***out***.println("Index out of bound for array");

}

}

}

**Sample Input & Output:**

Enter Number of Rows: 2

Enter Number of Column: 1

Enter First Matrix:

1 2

Enter Second Matrix:

1 3

First Matrix:---

1

2

Second Matrix:

1

3

Addition of Matrix:

2

5

**03. Matrix multiplication**

**Source Code:**

**import** java.util.Scanner;

**public** **class** App {

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

**try**{

Scanner input=**new** Scanner(System.***in***);

**int** a[][]=**new** **int**[10][10];

**int** b[][]=**new** **int**[10][10];

**int** c[][]=**new** **int**[10][10];

**int** i,j,k,row,col;

System.***out***.printf("Enter row of matrix: ");

row=input.nextInt();

System.***out***.printf("Enter column of matrix: ");

col=input.nextInt();

System.***out***.printf("Enter first matrix\n");

**for**(i=0;i<row;i++)

**for**(j=0;j<col;j++)

a[i][j]=input.nextInt();

System.***out***.printf("\nEnter second matrix \n");

**for**(i=0;i<row;i++)

**for**(j=0;j<col;j++)

b[i][j]=input.nextInt();

System.***out***.printf("\nFirst matrix is : \n");

**for**(i=0;i<row;i++)

{

**for**(j=0;j<col;j++)

System.***out***.printf("%d ",a[i][j]);

System.***out***.printf("\n");

}

System.***out***.printf("\nSecond matrix is\n");

**for**(i=0;i<row;i++)

{

**for**(j=0;j<col;j++)

System.***out***.printf("%d ",b[i][j]);

System.***out***.printf("\n");

}

**for**(i=0;i<row;i++)

**for**(j=0;j<col;j++)

{

c[i][j]=0;

**for**(k=0;k<col;k++)

c[i][j]=c[i][j]+(a[i][k]\*b[k][j]);

}

System.***out***.printf("\nMultiplication is\n");

**for**(i=0;i<row;i++)

{

**for**(j=0;j<col;j++)

System.***out***.printf("%d ",c[i][j]);

System.***out***.printf("\n");

}

}

**catch**(ArrayIndexOutOfBoundsException e){

System.***out***.println("Index out of bound for array");

}

}

}

**Sample Input & Output:**

Enter row of matrix: 3

Enter column of matrix: 3

Enter first matrix

2 4 5

3 4 5

1 2 3

Enter second matrix

1 3 4

6 7 8

1 2 3

First matrix is :

2 4 5

3 4 5

1 2 3

Second matrix is

1 3 4

6 7 8

1 2 3

Multiplication is

31 44 55

32 47 59

16 23 29

**04. Diagonal matrix**

**Source Code:**

**import** java.util.Scanner;

**public** **class** App {

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

**try**{

Scanner input=**new** Scanner(System.***in***);

**int** a[][]=**new** **int**[10][10];

**int** row,column;

System.***out***.print("Enter row and column of the matrix: ");

row=input.nextInt();

column=input.nextInt();

**for**(**int** i=1;i<=row;i++){

**for**(**int** j=1;j<=column;j++){

**if**(i==j){

a[i][j]=1;

}

**else**{

a[i][j]=0;

}

}

}

System.***out***.println("Diagonal Matrix: ");

**for**(**int** i=1;i<=row;i++){

**for**(**int** j=1;j<=column;j++){

System.***out***.print(a[i][j]+"\t");

}

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

}

}

**catch**(ArrayIndexOutOfBoundsException e){

System.***out***.println("Index out of bound for array");

}

}

}

**Sample Input & Output:**

Enter row and column of the matrix: 3 3

Diagonal Matrix:

1 0 0

0 1 0

0 0 1

**05. Transpose matrix**

**Source Code:**

**import** java.util.Scanner;

**public** **class** App {

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

**try**{

Scanner input=**new** Scanner(System.***in***);

**int** a[][]=**new** **int** [10][10];

**int** c[][]=**new** **int** [10][10];

**int** row,col,i,j;

System.***out***.printf("Enter Number of Rows:\n");

row=input.nextInt();

System.***out***.printf("Enter Number of Column:\n");

col=input.nextInt();

System.***out***.printf("Enter Matrix:\n");

**for**(i=0;i<row;i++)

**for**(j=0;j<col;j++)

a[i][j]=input.nextInt();

System.***out***.printf("Matrix:\n");

**for**(i=0;i<row;i++)

{

**for**(j=0;j<col;j++)

System.***out***.printf("%d ",a[i][j]);

System.***out***.printf("\n");

}

**for**(i=0;i<col;i++)

**for**(j=0;j<row;j++)

c[i][j]=a[j][i];

System.***out***.printf("Transpose of Matrix:\n");

**for**(i=0;i<col;i++)

{

**for**(j=0;j<row;j++)

System.***out***.printf("%d ",c[i][j]);

System.***out***.printf("\n");

}

}

**catch**(ArrayIndexOutOfBoundsException e){

System.***out***.println("Index out of bound for array");

}

}

}

**Sample Input & Output:**

Enter Number of Rows:

2

Enter Number of Column:

3

Enter Matrix:

2 3 4

1 2 3

Matrix:

2 3 4

1 2 3

Transpose of Matrix:

2 1

3 2

4 3

**String operation on array:**

**01. Compare two strings**

**Source Code:**

**import** java.util.Scanner;

**public** **class** App {

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

Scanner input=**new** Scanner(System.***in***);

String s1,s2;

System.***out***.println("Enter String 1 and 2: ");

s1=input.nextLine();

s2=input.nextLine();

**if**(s1.compareTo(s2)>0)

System.***out***.println(s1 +" is greater than "+s2);

**else**

System.***out***.println(s2 +" is greater than "+s1);

}

}

**Sample Input & Output:**

Enter String 1 and 2:

Chittagong

Comilla

Comilla is greater than Chittagong

**02. Extract substring from a given string**

**Source Code:**

import java.util.Scanner;

public class App {

public static void main(String[] args) {

try{

String s1,s2;

int n;

Scanner input=new Scanner(System.*in*);

System.*out*.print("Enter the string: ");

s1=input.nextLine();

System.*out*.print("Enter from which position u want to Extract: ");

n=input.nextInt();

s2=s1.substring(n);

System.*out*.println(s2);

}

catch(StringIndexOutOfBoundsException e){

System.*out*.println("Index out of bound for character");

}

}

}

**Sample Input & Output:**

Enter the string: I have read a book

Enter from which position u want to Extract: 7

read a book

**03. Replaced present substring by given substring**

**Source Code:**

import java.util.Scanner;

public class App {

public static void main(String[] args) {

String s1,s2,s3,s4;

int n;

Scanner input=new Scanner(System.*in*);

System.*out*.print("Enter the string: ");

s1=input.nextLine();

System.*out*.print("Enter the substring you want to replace: ");

s2=input.nextLine();

System.*out*.print("Enter the new substring: ");

s3=input.nextLine();

s3=s1.replace(s2,s3);

System.*out*.println("New String: "+s3);

}

}

**Sample Input & Output:**

Enter the string: I have read the book

Enter the substring you want to replace: book

Enter the new substring: topic

New String: I have read the topic

**04. Sort a series of strings alphabetically(upper to lower/ lower to upper)**

**Source Code:**

import java.util.Scanner;

public class App {

public static void main(String[] args) {

try{

Scanner input=new Scanner(System.*in*);

int n;

String temp;

System.*out*.print("Enter total number of strings: ");

n=input.nextInt();

temp=input.nextLine();

String name[]=new String[n];

for(int k=0;k<n;k++){

name[k]=input.nextLine();

}

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

for(int j=i+1;j<n;j++){

if(name[j].compareTo(name[i])<0){

temp=name[i];

name[i]=name[j];

name[j]=temp;

}

}

}

System.*out*.println("After Sorting: ");

for(int k=0;k<n;k++){

System.*out*.println(name[k]);

}

}

catch(StringIndexOutOfBoundsException e){

System.*out*.println("Index out of for character");

}

catch(ArrayIndexOutOfBoundsException e){

System.*out*.println("Index out of for string ");

}

}

}

**Sample Input & Output**:

Enter total number of strings: 5

babor

aslam

alim

kibria

intejar

After Sorting:

alim

aslam

babor

intejar

kibria

**05. Count words, numbers, space, characters for a string**

**Source Code:**

import java.util.Scanner;

public class App {

public static void main(String[] args) {

try{

String s;

int l,c = 0,n = 0,space=0,word=0,number=0;

Scanner input=new Scanner(System.*in*);

System.*out*.println("Enter a paragraph: ");

s=input.nextLine();

l=s.length();

for(int i=0;i<l;i++){

if((s.charAt(i)>='a' && s.charAt(i)<='z')||(s.charAt(i)>='A' &&

s.charAt(i)<='Z')){

c=1;

}

else if(s.charAt(i)>='0' && s.charAt(i)<='9'){

n=1;

}

else if(s.charAt(i)==' '){

space++;

if(c==1&&n==0){

word++;

}

else if(c==0&&n==1){

number++;

}

c=0;

n=0;

}

}

if(c==1&&n==0){

word++;

}

else if(c==0&&n==1){

number++;

}

System.*out*.println("Space: "+space);

System.*out*.println("Words: "+word);

System.*out*.println("Numbers: "+number);

System.*out*.println("Characters: "+l);

}

catch(StringIndexOutOfBoundsException e){

System.*out*.println("Index out of bound for character");

}

}

}

**Sample Input & Output:**

Enter a paragraph:

I have studied a book

Space: 4

Words: 5

Numbers: 0

Characters: 21

**06(a). Count occurrences of characters in a given string**

**Source Code:**

import java.util.Scanner;

public class App {

public static void main(String[] args) {

Scanner input=new Scanner(System.*in*);

String s,word;

System.*out*.print("Enter the string: ");

s=input.nextLine();

System.*out*.print("Enter the character to be searched: ");

word=input.nextLine();

int count = s.length() - s.replace(word, "").length();

System.*out*.println(word+" have been found "+count+" times");

}

}

**Sample Input & Output:**

Enter the string: I have read the book

Enter the character to be searched: v

v have been found 1 times

**06(b). Count occurrences of words in a given string**

**Source Code:**

import java.util.Scanner;

import java.util.regex.Matcher;

import java.util.regex.Pattern;

public class App {

public static void main(String[] args) {

Scanner input=new Scanner(System.in);

String s,word;

int i=0;

System.out.print("Enter the string: ");

s=input.nextLine();

System.out.print("Enter the word to be searched: ");

word=input.nextLine();

Pattern p = Pattern.compile(word);

Matcher m = p.matcher(s);

while (m.find()) {

i++;

}

System.out.println(word+" have been found "+i+" times");

}

}

**Sample Input & Output:**

Enter the string: How do you do?

Enter the word to be searched: do

do have been found 2 times

**Sorting and Searching:**

**01. Bubble sort**

**Source Code:**

**import** java.util.Scanner;

**public** **class** Run {

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

Demo d=**new** Demo();

d.input\_data();

d.bubblesort();

}

}

**public** **class** Demo {

**int**[] data = **new** **int**[100];

**int** n;

Scanner input=**new** Scanner(System.***in***);

**public** **void** input\_data(){

System.***out***.print("Enter how many elements you want to insert: ");

n=input.nextInt();

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

data[i]=input.nextInt();

System.***out***.println("Array before sorting: ");

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

System.***out***.print(data[i]+ "\t");

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

}

**public** **void** bubblesort(){

**try**{

**int** k,temp,p;

**for**(p=0;p<n-1;p++)

{

**for**(k=0;k<n-p-1;k++)

{

**if**(data[k]>data[k+1])

{

temp=data[k];

data[k]=data[k+1];

data[k+1]=temp;

}

}

}

System.***out***.println("Array after sorting: ");

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

System.***out***.print(data[i]+ "\t");

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

}

**catch**(ArrayIndexOutOfBoundsException e){

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

}

}

}

**Sample Input & Output:**

Enter how many elements you want to insert: 3

11 13 12

Array before sorting:

11 13 12

Array after sorting:

11 12 13

**02. Insertion sort**

**Source Code:**

public class Run {

public static void main(String[] args) {

Demo d=new Demo();

d.input\_data();

d.insertionsort();

}

}

import java.util.Scanner;

public class Demo {

int[] data = new int[100];

int n;

Scanner input=new Scanner(System.*in*);

public void input\_data(){

System.*out*.print("Enter how many elements you want to insert: ");

n=input.nextInt();

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

data[i]=input.nextInt();

System.*out*.println("Array before sorting: ");

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

System.*out*.print(data[i]+ "\t");

System.*out*.println();

}

public void insertionsort(){

int key,j,i;

for(j=1;j<n;j++)

{

key=data[j];

i=j-1;

while(i>=0 && data[i]>key)

{

data[i+1]= data[i];

i=i-1;

}

data[i+1]=key;

}

System.*out*.println("Array after sorting: ");

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

System.*out*.print(data[i]+ "\t");

}

}

**Sample Input & Output:**

Enter how many elements you want to insert: 3

8 5 9

Array before sorting:

8 5 9

Array after sorting:

5 8 9

**03. Quick sort**

**Source Code:**

**import** java.util.Scanner;

**public** **class** App {

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

**try**{

Scanner input=**new** Scanner(System.***in***);

**int** a[]=**new** **int**[100];

**int** b[]=**new** **int**[100];

**int** c[]=**new** **int**[100];

**int** n,i,k;

System.***out***.printf("Enter number of elements: ");

n=input.nextInt();

**for**(i=1;i<=n;i++)

a[i]=input.nextInt();

*quicksort*(a,1,n);

System.***out***.printf("\nAfter sorting: \n");

**for**(i=1;i<=n;i++)

System.***out***.printf("%d\t",a[i]);

}

**catch**(ArrayIndexOutOfBoundsException e){

System.***out***.println("Index out of bound for array");

}

**catch**(ArithmeticException e){

System.***out***.println("Math error!");

}

}

**public** **static** **void** quicksort(**int** a[],**int** p,**int** r){

**int** q;

**if**(p<r)

{

q=*partition*(a,p,r);

*quicksort*(a,p,q-1);

*quicksort*(a,q+1,r);

}

}

**public** **static** **int** partition(**int** a[],**int** p,**int** r){

**int** x,i,j,temp;

x=a[r];

i=p-1;

**for**(j=p;j<=r-1;j++)

{

**if**(a[j]<=x)

{

i=i+1;

temp=a[i];

a[i]=a[j];

a[j]=temp;

}

}

temp=a[i+1];

a[i+1]=a[r];

a[r]=temp;

**return**(i+1);

}

}

**Sample Input & Output:**

Enter number of elements: 5

23 45 67 2 8

After sorting:

2 8 23 45 67

**04. Merge sort**

**Source Code:**

**import** java.util.Scanner;

**public** **class** App {

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

Scanner input=**new** Scanner(System.***in***);

**int** i,n;

System.***out***.printf("Enter total number of elements: ");

n=input.nextInt();

**int** a[]=**new** **int** [n+1];

System.***out***.printf("Enter elements: ");

**for**(i=1;i<=n;i++)

a[i]=input.nextInt();

*merge\_sort*(a,1,n);

System.***out***.printf("After sorting: \n");

**for**(i=1;i<=n;i++){

System.***out***.printf("%d\t",a[i]);

}

}

**public** **static** **void** merge\_sort(**int** a[],**int** p,**int** r)

{

**int** q;

**if**(p<r)

{

q=(p+r)/2;

*merge\_sort*(a,p,q);

*merge\_sort*(a,q+1,r);

*merge*(a,p,q,r);

}

}

**public** **static** **void** merge(**int** a[],**int** p,**int** q,**int** r)

{

**int** n1,n2,i,j,k;

n1=q-p+1;

n2=r-q;

**int** lf[]=**new** **int**[n1+2];

**int** ri[]=**new** **int**[n2+2];

**for**(i=1;i<=n1;i++)

lf[i]=a[p+i-1];

**for**(j=1;j<=n2;j++)

ri[j]=a[q+j];

lf[n1+1]=1000000;

ri[n2+1]=1000000;

i=1;

j=1;

**for**(k=p;k<=r;k++)

{

**if**(lf[i]<=ri[j])

{

a[k]=lf[i];

i=i+1;

}

**else**

{

a[k]=ri[j];

j=j+1;

}

}

}

}

**Sample Input & Output:**

Enter total number of elements: 5

Enter elements: 23 46 7 8 34

After sorting:

7 8 23 34 46

**05. Radix sort**

**Source Code:**

**import** java.util.Scanner;

**public** **class** App {

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

**try**{

Scanner input=**new** Scanner(System.***in***);

String dummy,temp;

**int** i=0,d,total,j,k;

System.***out***.print("Enter number of digits: ");

d=input.nextInt();

System.***out***.printf("Enter total number: ");

total=input.nextInt();

temp=input.nextLine();

String number[]=**new** String[total];

System.***out***.printf("\nEnter numbers: \n");

**for**(i=0;i<total;i++)

number[i]=input.nextLine();

**for**(k=d-1;k>=0;k--)

{

**for**(i=0;i<total;i++)

{

**for**(j=1;j<total-i-1;j++)

{

**if**(number[j].charAt(k)>number[j+1].charAt(k))

{

dummy=number[j];

number[j]=number[j+1];

number[j+1]=dummy;

}

}

}

}

System.***out***.printf("\nAfter sorting:");

**for**(i=0;i<total;i++)

System.***out***.printf("\n%s",number[i]);

}

**catch**(StringIndexOutOfBoundsException e){

System.***out***.println("Index out of for character");

}

**catch**(ArrayIndexOutOfBoundsException e){

System.***out***.println("Index out of for string ");

}

}

}

**Sample Input & Output:**

Enter number of digits: 4

Enter total number: 4

Enter numbers:

7777

1111

4444

2222

After sorting:

7777

1111

2222

4444

**06. Selection sort**

**Source Code:**

**import** java.util.Scanner;

**public** **class** App {

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

**try**{

Scanner input=**new** Scanner(System.***in***);

**int** a[]=**new** **int**[100];**int**

n,temp,i,j;

System.***out***.printf("Enter the number of elements: ");

n=input.nextInt();

System.***out***.printf("Enter the elements: ");

**for**(i=1;i<=n;i++)

{

a[i]=input.nextInt();

}

**for**(i=1;i<=n-1;i++)

{

**for**(j=i+1;j<=n;j++)

{

**if**(a[i]>a[j])

{

temp=a[i];

a[i]=a[j];

a[j]=temp;

}

}

}

System.***out***.printf("The Ascending order");

**for**(i=1;i<=n;i++)

System.***out***.printf("\n%d",a[i]);

}

**catch**(ArrayIndexOutOfBoundsException e){

System.***out***.println("Index out of bound for array");

}

}

}

**Sample Input & Output:**

Enter the number of elements: 5

Enter the elements: 23 4 7 8 9

The Ascending order

4

7

8

9

23

**07. Binary search**

**Source Code:**

**public** **class** Run {

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

Demo d=**new** Demo();

d.input\_data();

d.binarysearch();

}

}

**import** java.util.Scanner;

**public** **class** Demo {

**int**[] data = **new** **int**[100];

**int** n;

Scanner input=**new** Scanner(System.***in***);

**public** **void** input\_data(){

System.***out***.print("Enter how many elements you want to insert: ");

n=input.nextInt();

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

data[i]=input.nextInt();

}

**public** **void** binarysearch(){

**int** beg=0,mid,end=n,item;

mid=(beg+end)/2;

System.***out***.print("Enter element to be searched: ");

item=input.nextInt();

**while**(beg<=end && data[mid]!=item)

{

**if**(item<data[mid])

{

end=mid-1;

}

**else**

{

beg=mid+1;

}

mid=((beg+end)/2);

}

**if**(item==data[mid])

System.***out***.println("Item found in position " +(mid+1));

**else**

System.***out***.println("Item not found");

}

}

**Sample Input & Output:**

Enter how many elements you want to insert: 3

2 6 9

Enter element to be searched: 6

Item found in position 2

**08. Linear search**

**Source Code:**

**public** **class** Run {

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

Demo d=**new** Demo();

d.input\_data();

d.linearsearch();

}

}

**import** java.util.Scanner;

**public** **class** Demo {

**int**[] data = **new** **int**[100];

**int** n;

Scanner input=**new** Scanner(System.***in***);

**public** **void** input\_data(){

System.***out***.print("Enter how many elements you want to insert: ");

n=input.nextInt();

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

data[i]=input.nextInt();

}

**public** **void** linearsearch(){

**int** item,j=0;

System.***out***.print("Enter element to be searched: ");

item=input.nextInt();

**for**(**int** i=0;i<n;i++){

**if**(data[i]==item){

System.***out***.println("Item found in position " +(i+1));

j=1;

**break**;

}

}

**if**(j==0)

System.***out***.println("Item not found");

}

}

**Sample Input & Output:**

Enter how many elements you want to insert: 4

-1 2 3 4

Enter element to be searched: -1

Item found in position 1

**Class and Objects:**

**01. Calculate area of a rectangle using methods**

**Source Code:**

public class RoomArea {

public static void main(String[] args) {

Demo d=new Demo();

d.input();

d.calculation();

d.display();

}

}

import java.util.Scanner;

public class Demo {

float length;

float width;

float area;

void input()

{

Scanner input=new Scanner(System.*in*);

System.*out*.print("Enter length: ");

length=input.nextFloat();

System.*out*.print("Enter width: ");

width=input.nextFloat();

}

void calculation()

{

area=width\*length;

}

void display()

{

System.*out*.println("Area: "+area);

}

}

**Sample Input & Output:**

Enter height: 5

Enter width: 2

Area: 10.0

**02. Demonstrate constructor, method overloading, method overriding**

**Source Code:**

public class App {

public static void main(String[] args) {

int a=10,b=20;

Rectangle rec=new Rectangle(a,b);

Rectangle rec1=new Rectangle(a);

Square sqr=new Square(b);

rec.show();

rec1.show();

sqr.show();

}

}

public class Rectangle {

int length,width;

public Rectangle(int a,int b){

length=a;

width=b;

}

public Rectangle(int a){

length=a;

width=a;

}

public void show(){

System.*out*.println("Area: "+(length\*width));

}

}

public class Square extends Rectangle {

public Square(int a){

super(a);

length=a;

}

public void show(){

System.*out*.println("Area of square: "+length\*length);

}

}

**Sample Input & Output:**

Area: 200

Area: 100

Area of square: 400

**03. Demonstrate Interface , Multiple Inheritance**

**Source Code:**

class Hybrid

{

public static void main(String args[])

{

Results student1 = new Results();

student1.getNumber(1234);

student1.getMarks(27.5F, 33.0F);

student1.display();

}

}

class Student

{

int rollNumber ;

void putNumber()

{

System.*out*.println("Roll No : " + rollNumber ) ;

}

void getNumber(int n){

rollNumber=n;

}

}

interface Sports {

float *sportWt* = 6.0F ;

void putWt();

}

class Test extends Student

{

float part1, part2 ;

public void getMarks (float m1, float m2)

{

part1 = m1 ;

part2 = m2;

}

public void putMarks()

{

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

System.*out*.println("Part1 = " + part1) ;

System.*out*.println("Part2 = " +part2) ;

}

}

class Results extends Test implements Sports

{

float total ;

public void putWt()

{

System.*out*.println("Sports Wt = " + *sportWt*) ;

}

public void display()

{

total = part1 + part2 + *sportWt* ;

putNumber() ;

putMarks() ;

putWt() ;

System.*out*.println("Total Score = " + total) ;

}

}

**Sample Input & Output:**

Roll No : 1234

Marks obtained

Part1 = 27.5

Part2 = 33.0

Sports Wt = 6.0

Total Score = 66.5

**File operation:**

**01. Take a file , extract words by words in another file**

**Source Code:**

import java.io.BufferedWriter;

import java.io.File;

import java.io.FileReader;

import java.io.FileWriter;

import java.io.IOException;

import java.util.Scanner;

public class App {

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

//String s;

FileReader f = new FileReader("j.txt");

Scanner input=new Scanner(f);

File file = new File("filename.txt");

FileWriter fw = new FileWriter(file.getAbsoluteFile());

BufferedWriter bw = new BufferedWriter(fw);

//s=input.nextLine();

if (!file.exists()) {

file.createNewFile();

}

while(input.hasNext()){

String s=input.next();

bw.write(s+" ");

//System.out.println(s);

}

bw.close();

}

}

**Sample Input & Output:**

**Input:**

I am a student.

I read in comilla University.

**Output:**

I am a student. I read in comilla University.

**02. Take a file and count words, character, space, digits, numbers**

**Source Code:**

import java.io.FileReader;

import java.util.Scanner;

public class Count {

public static void main(String[] args)throws Exception {

FileReader file = new FileReader("j.txt");

String s;

int l,c = 0,n = 0,space=0,word=0,number=0,digit=0;

Scanner input=new Scanner(file);

s=input.nextLine();

l=s.length();

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

{

if((s.charAt(i)>='a' && s.charAt(i)<='z')||(s.charAt(i)>='A' &&

s.charAt(i)<='Z')){

c=1;

}

else if(s.charAt(i)>='0' && s.charAt(i)<='9'){

n=1;

digit++;

}

else if(s.charAt(i)==' '){

space++;

if(c==1&&n==0){

word++;

}

else if(c==0&&n==1){

number++;

}

c=0;

n=0;

}

}

if(c==1&&n==0){

word++;

}

else if(c==0&&n==1){

number++;

}

System.out.println("Space: "+space);

System.out.println("Words: "+word);

System.out.println("Numbers: "+number);

System.out.println("Characters: "+l);

System.out.println("Digit: "+digit);

}

}

**Sample Input & Output:**

I am a student. My ID is 1208020.

Space: 7

Words: 7

Numbers: 1

Characters: 33

Digit: 7

**03. Take two files and print similar words, dissimilar words for each file.**

**Source Code:**

**Sample Input & Output:**

**04. Write a program to read CSV(Comma Separated Value)**

**Source Code:**

import java.io.File;

import java.io.FileNotFoundException;

import java.util.Scanner;

public class App {

public static void main(String[] args) {

File file=new File("id.csv");

try {

Scanner input=new Scanner(file);

while(input.hasNext()){

String s=input.next();

System.out.println(s);

}

}

catch (FileNotFoundException e) {

e.printStackTrace();

}

}

}

**Sample Input & Output:**

**Input:**

Roll,Name,ID

1,Imran,1208001

20,Anon,1208020

3,Borhan,1208003

7,Naim,1208007

6,Salman,1208006

**Output:**

Roll,Name,ID

1,Imran,1208001

20,Anon,1208020

3,Borhan,1208003

7,Naim,1208007

6,Salman,1208006

**05. Write a program to read Tab Separated Value.**

**Source Code:**

import java.io.File;

import java.io.FileNotFoundException;

import java.util.Scanner;

public class App {

public static void main(String[] args) throws FileNotFoundException {

File file=new File("idsheet.tsv");

try {

Scanner input=new Scanner(file);

while(input.hasNext()){

String s=input.nextLine();

System.out.println(s);

}

} catch (FileNotFoundException e) {

e.printStackTrace();

}

}

}

**Sample Input & Output:**

**Input:**

Roll Name ID

1 Imran 1208001

20 Anon 1208020

3 Borhan 1208003

7 Naim 1208007

6 Salman 1208006

27 Zahid 1108027

**Output:**

Roll Name ID

1 Imran 1208001

20 Anon 1208020

3 Borhan 1208003

7 Naim 1208007

6 Salman 1208006

27 Zahid 1108027

**Tree and Graph:**

**01. Write a program to calculate to generate adjacent nodes of a graph.**

**Source Code:**

**import** java.util.Scanner;

**public** **class** App {

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

Scanner input=**new** Scanner(System.***in***);

String s,temp;

System.***out***.print("Enter total number of vertices: ");

**int** n = input.nextInt();

temp=input.nextLine();

**int** a[][]=**new** **int** [n+1][n+1];

**for**(**int** i=1;i<=n;i++){

**for**(**int** j=1;j<=n;j++){

**if**(i==j){

a[i][j]=0;

**continue**;

}

System.***out***.print("Enter 'y' if Vertex-"+i+" have an edge with Vertex-"+j+" : ");

s=input.nextLine();

**if**(s.compareTo("y")==0)

a[i][j]=1;

**else**

a[i][j]=0;

}

}

**for**(**int** i=1;i<=n;i++){

System.***out***.print(i+" -> ");

**for**(**int** j=1;j<=n;j++){

**if**(a[i][j]!=0)

System.***out***.print(j+"\t");

}

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

}

}

}

**Sample Input & Output:**

Enter total number of vertices: 4

Enter 'y' if Vertex-1 have an edge with Vertex-2 : y

Enter 'y' if Vertex-1 have an edge with Vertex-3 : n

Enter 'y' if Vertex-1 have an edge with Vertex-4 : y

Enter 'y' if Vertex-2 have an edge with Vertex-1 : y

Enter 'y' if Vertex-2 have an edge with Vertex-3 : y

Enter 'y' if Vertex-2 have an edge with Vertex-4 : n

Enter 'y' if Vertex-3 have an edge with Vertex-1 : y

Enter 'y' if Vertex-3 have an edge with Vertex-2 : n

Enter 'y' if Vertex-3 have an edge with Vertex-4 : j

Enter 'y' if Vertex-4 have an edge with Vertex-1 : y

Enter 'y' if Vertex-4 have an edge with Vertex-2 : y

Enter 'y' if Vertex-4 have an edge with Vertex-3 : u

1 -> 2 4

2 -> 1 3

3 -> 1

4 -> 1 2

02. Generate a tree structure from data.

Source Code:

Sample Input & Output: