1. Write 3 different java programs to print the following patterns

                a) 1

                   12

                   123

1234

                   12345

Ans:

import java.util.\*;

public class pattern1

{

public static void main(String[] args)

{

Scanner sc =new Scanner(System.in);

System.out.println("Enter the lines:");

int num=sc.nextInt();

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

{

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

{

System.out.print(j);

}

System.out.println();

}

  }

}

                b) 54321

                   5432

                   543

                   54

                   5

Ans:

  import java.util.\*;

public class pattern2

{

public static void main(String[] args)

{

Scanner sc =new Scanner(System.in);

System.out.println("Enter the lines:");

int num=sc.nextInt();

for(int i=num;i>=1;i--)

{

int k=5;

for(int j=i;j>=1;j--)

{

System.out.print(k);

k--;

}

System.out.println();

}

  }

}

                c)     x

                      xxx

                     xxxxx

                   xxxxxxx

                     xxxxx

                      xxx

                       x

Ans:

import java.util.Scanner;

class pattern3

{

public static void main(String[] args)

{

int star=1,lines;

System.out.print("Enter the number of lines: ");

Scanner s = new Scanner(System.in);

lines = s.nextInt();

int space=(lines\*2)-1;

int mid=(lines\*2)/2;

for(int i=1;i<=(lines\*2)-1;i++)

{

for(int j=1;j<=space;j++)

{

System.out.print(" ");

}

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

{

System.out.print("x");

}

System.out.println();

if(i<mid){

star=star+2;

space--;

}else {

star=star-2;

space++;

}

}

}

}

2. Write a java program to take the input from user and determine if it is a prime number or not.

 Ans :

import java.util.Scanner;

public class prime {

public static void main(String args[]) {

int i, flag = 0;

int num;

System.out.print("Enter the number of lines: ");

Scanner sc = new Scanner(System.in);

num = sc.nextInt();

if (num == 0 || num == 1) {

System.out.println(num + " is not prime number");

} else {

for (i = 1; i <= num; i++) {

if (num % i == 0) {

flag++;

}

}

if (flag == 2) {

System.out.println(num + " is prime number");

}else{

System.out.println(num + " is not prime number");

}

}

}

}

Output:

Enter the number of lines: 17

17 is prime number

3. Write a java program to display the fibonacci series till less than 200 using only 2 variables.

Ans:

import java.util.Scanner;

class fibo {

public static void main(String args[]) {

int n1 = 0, n2 = 1, i, count;

System.out.print("Enter the count of series: ");

Scanner sc = new Scanner(System.in);

count = sc.nextInt();

System.out.print(n1 + " " + n2);

for (i = 2; i < count; ++i)

{

n2 = n1 + n2;

if(n2<200)

{

System.out.print(" " + n2);

n1 = n2 - n1;

}

else

{

break;

}

}

}

}

Output:

Enter the count of series: 14

0 1 1 2 3 5 8 13 21 34 55 89 144

5.Write Java program to check if a name is palindrome.

Ans:

import java.util.Scanner;

public class palin {

public static void palindrome(String s)

{

String reverse = new StringBuffer(s).reverse().toString();

if (s.equals(reverse))

System.out.println(s+" is a palinderome ");

else

System.out.println(s+" is not a palindrome");

}

public static void main (String[] args)

throws java.lang.Exception

{

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

Scanner sc = new Scanner(System.in);

String name=sc.next();

palindrome(name);

}

}

Output:

Enter the name: ava

ava is a palinderome

6.Write Java program to check if a number is Armstrong number or not? (input 153 output true,  123 output false)

 Ans:

import java.util.Scanner;

class Armstrong{

public static void main(String[] args) {

int arm=0,r,temp;

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

Scanner sc = new Scanner(System.in);

int n=sc.nextInt();

temp=n;

while(n>0)

{

r=n%10;

n=n/10;

arm=arm+(r\*r\*r);

}

if(temp==arm)

System.out.println(temp+"is an armstrong number");

else

System.out.println(temp+"is not an armstrong number");

}

}

Output:

Enter the value: 153

153 is an Armstrong number

7.How to find factorial of number in Java using iteration?

Ans :

import java.util.Scanner;

 class Fact{

public static void main(String args[]){

int i,fact=1;

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

Scanner sc = new Scanner(System.in);

int n=sc.nextInt();

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

fact=fact\*i;

}

System.out.println("Factorial of "+n+" is: "+fact);

}

}

Output:

Enter the number: 5

Factorial of 5 is 120

8.Write a Java code to take a character as a input from user and determine if it is a vowel or a consonant using conditional construct.

Ans:

Import java.util.Scanner;

Class vowelCon

{

public static void main(String[ ] arg)

{

int i=0;

Scanner sc=new Scanner(System.in);

System.out.println("Enter a character : ");

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

if(ch=='a'||ch=='e'||ch=='i'||ch=='o'||ch=='u'||ch=='A'||ch=='E'||ch=='I'||ch=='O'||ch=='U')

{

System.out.println(ch+" is Vowel");

}

else if((ch>='a'&&ch<='z')||(ch>='A'&&ch<='Z'))

System.out.println(ch+" is Consonant");

else

System.out.println("Not an alphabet");

}

}

Output:

Enter a character: e

e is Vowel

9. Write a switch case java code to create calculator with + - / \* functionalities only.

Ans:

import java.util.Scanner;

public class Calculator {

public static void main(String[] args) {

Scanner reader = new Scanner(System.in);

System.out.print("Enter two numbers: ");

double num1 = reader.nextDouble();

double num2 = reader.nextDouble();

System.out.print("Enter an operator (+, -, \*, /): ");

char operator = reader.next().charAt(0);

double result;

switch(operator)

{

case '+':

result = num1 + num2;

System.out.println("Addition is "+result);

break;

case '-':

result = num1 - num2;

System.out.println("Substraction is "+result);

break;

case '\*':

result = num1\*num2;

System.out.println("Multiplication is "+result);

break;

case '/':

result = num1 / num2;

System.out.println("Division is "+result);

break;

default:

System.out.printf("Invalid choice");

}

}

}

Output:

Enter two numbers: 15 5

Enter an operator(+,-,\*,/): \*

Multiplication is 75

10. Write a java code to copy one array into another.

Ans:

import java.util.\*;

public class arrayCopy {

public static void main(String[] args) {

System.out.println("Enter the size:");

Scanner sc = new Scanner(System.in);

int size = sc.nextInt();

int[] arr1 = new int[size];

System.out.println("Enter the array:");

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

arr1[i] = sc.nextInt();

}

int arr2[] = new int[arr1.length];

arr2 = arr1;

System.out.println("Values of arr1[] ");

for (int i = 0; i < arr1.length; i++)

System.out.print(arr1[i] + " ");

System.out.println("\n\ Values of arr2[] ");

for (int i = 0; i < arr2.length; i++)

System.out.print(arr2[i] + " ");

}

}

Output:

Enter the size:

5

Enter the array:

12 34 53 54 75

Values of arr1[]

12 34 53 54 75

Values of arr2[]

12 34 53 54 75

11. Write a java code to compare the length of two arrays and display the longer array.

Ans:

public class longerArray {

public static void main(String[] args) {

int[] arr1 = {12,34,45,23,53,55};

int[] arr2 = {19,35,56};

System.out.println("Elements of longer array:");

if(arr1.length>arr2.length){

for (int i = 0; i <arr1.length; i++) {

System.out.println(arr1[i]);

}

}else

{

for (int i = 0; i <arr2.length; i++) {

System.out.println(arr2[i]);

}

}

}

}

Output:

Elements of longer array:

12

34

45

23

53

55

12. Write a java code to display a reverse String array.

Ans:

import java.util.Collections;

import java.util.List;

import java.util.Arrays;

public class RevStringArray {

public static void main(String args[]){

String[] names = new String[]{"Sagar", "Manish", "Akash", "Pavan"};

List<String> list = Arrays.asList(names);

Collections.reverse(list);

names = (String[]) list.toArray();

System.out.println("String array reversed");

for(int i=0; i < names.length; i++){

System.out.println(names[i]);

}

}

}

Output:

String array reversed

Pavan

Akash

Manish

Sagar

13.   Write the difference between checked and unchecked exception with example code

Ans:

The exceptions that are checked at compile time are called as Checked Exceptions . The checked exception is called as error. If some code within a method throws a checked exception, then the method must either handle the exception or it must specify the exception using throws keyword.

import java.io.\*;

class checkExcep {

public static void main(String[] args) {

FileReader file = new FileReader("C:\\test\\demo.txt");

BufferedReader br= new BufferedReader(file);

for (int counter = 0; counter < 3; counter++)

System.out.println(br.readLine());

br.close();

}

}

Exception in thread "main" java.lang.Error: Unresolved compilation problems:

Unhandled exception type FileNotFoundException

Unhandled exception type IOException

Unhandled exception type IOException

In above example it gives an checked exception and displays the first 3 lines of demo.txt.

Unchecked are the exceptions that are not checked at compile time. It means if the program is throwing an unchecked exception and even if we declared that exception, but the complier will not give a compilation error. All Unchecked exceptions are direct sub classes of RuntimeException class.

The unchecked exception classes are:

NullPointerException

ArrayIndexOutOfBoundsException

ArithmeticException

IllegalArgumentException

NumberFormatException

class Demo {

public static void main(String args[]) {

int x = 0;

int y = 10;

int z = y/x;

}

}

Output:

Exception in thread "main" java.lang.ArithmeticException: / by zero at Demo.main(Demo.java:5)

In above program, it compiles completely but it throws ArithmeticException when run. The compiler allows it to compile, because ArithmeticException is an unchecked exception.

14.   Write the difference between throw and throws with example code

Throws keyword is used to declare an exception, which specifies that any class or method may throw exception of that particular type. And throw keyword is used to throw an exception explicitly.

In syntax throw is followed by an instance of Exception class and throws is followed by exception class names.

Throw keyword is used in the method body to throw an exception, but throws is used in method signature to declare the exceptions that can occur by the statements present in the method body.

Throws example :

public class throw1{

void checkAge(int age){

if(age<18)

throw new ArithmeticException("Not Eligible for voting");

else

System.out.println("Eligible for voting");

}

public static void main(String args[]){

throw1 t1 = new throw1();

t1.checkAge(13);

System.out.println("End Of Program");

} }

Output:

Exception in thread "main" java.lang.ArithmeticException:

Not Eligible for voting

at throw1.checkAge(throw1.java:4)

at throw1.main(throw1.java:10)

In above example the method checkAge() contains the throw keyword is used to throw an arithmetic exception.Which throws the exception if age is less than 18.

Throws example:

public class Throws1{

int division(int a, int b) throws ArithmeticException{

int t = a/b;

return t;

}

public static void main(String args[]){

Throws1 t1 = new Throws1();

try{

System.out.println(t1.division(15,0));

}

catch(ArithmeticException e){

System.out.println("Number can not be divided by zero");

}

}

}

Output: Number can not be divided by zero

In above example the throws keyword is used to declare that the ArithmeticException maybe occurred from the division methods statements.And its handled in by using try catch block.

15.   Write a note or nested try…catch block with example code

A try catch block is within another try block is called the nested try catch block. Sometimes a situation may arise where a part of a block may cause one error and the entire block itself may cause another error. In such cases, exception handlers have to be nested..

If neither catch block nor parent catch block handles exception then the system generated message is shown for the exception.

class nest{

public static void main(String args[]){

try{

try{

System.out.println("going to divide");

int b =35/0;

}catch(ArithmeticException e){System.out.println(e);}

try{

int a[]=new int[5];

a[5]=4;

}catch(ArrayIndexOutOfBoundsException e){System.out.println(e);}

System.out.println("other statement);

}catch(Exception e){System.out.println("handeled");}

System.out.println("normal flow..");

}

}

Above example shows the nested try catch block which contains different exception codes with catch blocks.

16.   Write a note on MultiThreading and MultiTasking

Multitasking means to execute more than one task at the same time.We can perform more than one task simultaneously.

Multithreading is a process of executing multiple threads simultaneously. Multithreading is also known as Thread-based Multitasking.

17.   Write a short note on Deque and give example code.

Deque is a queue in which we can add and remove elements from both sides.

Deque is an interface and has two implementations: LinkedList and ArrayDeque. Deque is abbreviation for Double Ended Queue.

Examples to create a Deque instance:

Deque dq = new LinkedList();

Deque dq = new ArrayDeque();

import java.util.Deque;

import java.util.ArrayDeque;

public class DequeExample {

Deque dequeA = new LinkedList();

dequeA.add("element 0");

dequeA.add("element 1");

dequeA.add("element 2");

Iterator iterator = dequeA.iterator();

while(iterator.hasNext(){

String element = (String) iterator.next();

}

}}

In above example one deque instance is created with LinkedList class and three elements are added to the deque and displayed using iterator.

18.   Write a short note on Generics an all types of Parameters used in Generics with example code.

A class that can refer to any data type is known as generic class.The mostly usedtype is T type parameter to create the generic class of specific type.

Creating generic class:

class MyGen<T>{

T obj;

void add(T obj){this.obj=obj;}

T get(){return obj;}

}

The T type indicates that it can refer to any type like String, Integer, Employee. The type we specify for the class will be used to store and retrieve the data.

Types of Parameters

The type parameters in generics are naming conecntions used for specifying type. The type parameters are as follows:

T - Type

E - Element

K - Key

N - Number

V – Value

Example using E parameter :

public class Test{

public static < E > void printArray(E[] elements) {

for ( E element : elements){

System.out.print(element+” “ );

}

System.out.println();

}

public static void main( String args[] ) {

Integer[] intArray = { 10, 20, 30, 40, 50 };

System.out.println( "Printing Integer Array" );

printArray( intArray );

}

}

output: 10 20 30 40 50

In above example the E parameter generics used to iterate thorugh the Integer array.

19.   Write a short note on Map Interface.

A map contains values as key and value pair. Each key and value pair is known as an entry. Map contains only unique keys.

Map is useful when we have to search, update or delete elements on the basis of key.

Map interface has some methods put(),putAll(),remove(),get() etc. for the manipulation of values.

20.   Write the difference between LinkedList and ArrayList.

Describe the different approaches of String processing.

|  |  |
| --- | --- |
| ArrayList | LinkedList |
| 1) ArrayList internally uses dynamic array to store the elements. | LinkedList internally uses doubly linked list to store the elements. |
| 2) Manipulation with ArrayList is slow because it internally uses array. If any element is removed from the array, all the bits are shifted in memory. | Manipulation with LinkedList is faster than ArrayList because it uses doubly linked list so no bit shifting is required in memory. |
| 3) ArrayList class implements List only. | LinkedList class implements List and Deque interfaces. |
| 4) ArrayList is better for storing and accessing data. | LinkedList is better for manipulating data. |

21.   Write a note on Dynamic array in java.

Dynamic array is an array which grows at runtime and can store any number of values in it.

ArrayList class uses a dynamic array for storing the elements. It inherits AbstractList class and implements List interface.

The important points about Java ArrayList class are:

* ArrayList class can contain duplicate elements.
* ArrayList class maintains insertion order.
* ArrayList allows random access because array works at the index basis.

22.   What is the purpose of the System class?

System class contains several useful class fields and methods. It cannot be instantiated.

Standard input,output and error output streams are provided with System class. These are used to access the externally defined properties and environment variables.

Example :

System.in - for input device.

System.out – for output device

23.   Which is the abstract parent class of FileWriter ?

OutputStreamReader is the abstract parent class of FileWriter.

24.   Which class is used to read streams of characters from a file?

FileReader class is used to read the streams of characters from a file.It contains the methods read() for reading.

25.   Which class is used to read streams of raw bytes from a file?

FileInputStream class is used to read streams of raw bytes from a file.

26.   What are the differences between FileInputStream/FileOutputStream and RandomAccessFile

RandomAccessFile treats the file as an array of bytes where it has the internal pointer.

RandomAccessFile treats it as large array.FileInputStream reads the stream and returns the data. It is mostly used for reading raw data like images etc. It does not treat the file as a large array, it just keeps marks of where in the file it has read. FileInputStream read the data and place it into an array to get the access as RandomAccessFile.

The RandomAccessFile class has methods that perform the direct access to data of any part of the file. RandomAccessFile class also provides the facilities to read and write data from a single file without closing the streams for each read or write. It can write primitive data to the files.

FileInputStream and FileOutputStream are separately used for reading and writing contents but RandomAccessFile used for both.

27.   Write a note on Channels and Buffer with example.

A channel is an open connection between a data source and a Java program to perform I/O operations.

The Channel interface is in the java.nio.channels package.

Channel interface declares only two methods: close() and isOpen().

A buffer is essentially a block of memory into which you can write data, which you can then later read again.

28.   What is the difference between System.out ,System.err and System.in?

System.in is passed as parameter to the DataInputStream constructor and its linked to System.in. readLine() method reads from in stream which is entered from keyboard.It works like scanf in c language.

System.in is passed as parameter to the PrintStream constructor and its linked to System.out. println() method writes to console which is passed as normal message.It works like printf in c language.

System.err is the "standard" error output stream. This stream is already open and ready to accept output data.

err is also an object of PrintStream connected implicitly to output mechanism of OS.

It also writes contents to the console but it displays the error messages.

35.   Write a note on PreparedStatement and ResultSetMetaData interfaces with code snippets.

Java ResultSetMetaData Interface

The metadata means data about data i.e. we can get further information from the data.

If you have to get metadata of a table like total number of column, column name, column type etc. , ResultSetMetaData interface is useful because it provides methods to get metadata from the ResultSet object.

import java.sql.\*;

class ResultSetmd{

public static void main(String args[]){

try{

Class.forName("oracle.jdbc.driver.OracleDriver");

Connection con=DriverManager.getConnection(

"jdbc:mysql://localhost:3306/rsmd","root","root");

PreparedStatement ps=con.prepareStatement("select \* from emp");

ResultSet rs=ps.executeQuery();

ResultSetMetaData rsmd=rs.getMetaData();

System.out.println("Total columns: "+rsmd.getColumnCount());

System.out.println("Column Name of 1st column: "+rsmd.getColumnName(1));

System.out.println("Column Type Name of 1st column: "+rsmd.getColumnTypeName(1));

con.close();

}catch(Exception e){ System.out.println(e);}

}

}

Output:Total columns: 2

Column Name of 1st column: ID

Column Type Name of 1st column: NUMBER

PreparedStatement interface

The PreparedStatement interface is a subinterface of Statement. It is used to execute parameterized query.

String sql="insert into emp values(?,?,?)";

We are passing parameter (?) for the values. Its value will be set by calling the setter methods of PreparedStatement.

The performance of the application will be faster if you use PreparedStatement interface because query is compiled only once.

The prepareStatement() method of Connection interface is used to return the object of PreparedStatement.

import java.sql.\*;

class InsertStmt{

public static void main(String args[]){

try{

Class.forName("oracle.jdbc.driver.OracleDriver");

Connection con=DriverManager.getConnection("jdbc:mysql://localhost:3306/psd ","system","system");

PreparedStatement stmt=con.prepareStatement("insert into Emp values(?,?)");

stmt.setInt(1,101);

stmt.setString(2,"Ratan");

int i=stmt.executeUpdate();

System.out.println(i+" records inserted");

con.close();

}catch(Exception e){ System.out.println(e);}

}

}

In above example the record is inserted in EMP table by using prepared statement.

36.  Write a note on DDL, DML, DQL, DDL with code snippets.

Data Definition Language (DDL)

The SQL commands that are used to create database schema,change the structure of the database objects and delete database objects from database are called as DDL. Examples include Create, Alter , Drop, Truncate, Rename and Comment Commands.

Create

Create command is used to create database as tables, stored procedure, views etc.

Example

To create Employee table.

create table tblEmployee(

Id int primary key identity(1,1) not null,

Name nvarchar(50) ,

Gender nvarchar(50) ,

Salary int ,

DepartmentId int ,

)

Alter

Alter command is used to change database and its Objects.

e.g. alter table Emplyoee drop empid;

Drop

Drop command is used to delete objects from database.

e.g. drop employee;

Truncate

Trunctae Table command is used to remove all records from a table, including all spaces allocated for records are removed.

e.g. truncate employee;

Rename

It is used to rename the objects.

E.g rename employee to emp;

Data Manipulation Language (DML)

The commands of SQL that are used to insert data into the database, modify the data of the database and to delete data from the database are called as DML. Examples include Insert, Update and Delete.

Insert

To insert date into a table.

e.g. insert into stud values(1,’Shubham’);

Update

To update the existing data in a table.

e.g update table stud set name=’Sagar’ where id=3;

Delete

delete all records from a table.

e.g delete \* from stud;

Data Query Language (DQL)

The commands of SQL that are used to retrieve data from the database are called as DQL. So all Select statements comes under DQL.

Select

To retreive data from the database table.

Data Control Language (DCL)

The commands of SQL that are used to control the access to data stored in the database are called as DCL and examples include Grant and Revoke.

Grant

All users access previleges to database.

Revoke

Withdraw users access previleges given by using the Grant command.

37.   Write a note on HTML , CSS and Javascript.

HTML stands for Hyper Text Markup Language.

 Hyper Text means Text within Text. A text has a link within it, is a hypertext. Every time when clicked on a hypertext it goes to the another page.

 A markup language is a programming language that is used make text more interactive and dynamic. It can turn a text into images, tables, links etc.

An HTML document is made of many HTML tags and each HTML tag contains different content.

<html>

<body>

<h1>First Heading</h1>

<p>First Paragraph.</p>

</body>

</html>

It create an html webpage and displays First Heading and First Paragraph as output.

CSS stands for Cascading Style Sheet.CSS is used to design HTML tags.CSS is a widely used language on the web.

HTML, CSS and JavaScript are used for web designing. It helps the web designers to apply style on HTML tags.

<html>

<head>

<style>

h1{

color:white;

background-color:red;

padding:5px;

}

p{

color:blue;

}

</style>

</head>

< body>

<h1>Write Your First CSS Example</h1>

<p>This is Paragraph.</p>

</body>

</html>

It displays the content on webpage with background color as red.

JavaScript is an object-based scripting language that is lightweight and cross-platform.

JavaScript is not compiled but translated. The JavaScript Translator is embedded in browser an it is responsible to translate the JavaScript code.

<h2>Welcome to JavaScript</h2>

<script>

document.write("Welcome to NIIT");

</script>

It displays the heading as Welcome to JavaScript and the message as Welcome to NIIT.

39.   Describe the different approaches of String processing.