[To understand any java concept you can refer this video link : [Learn Core Java](https://www.youtube.com/playlist?list=PLl7_v0mPHiMjvU_PzLyJicdvbo7OVuzNF) ]

1. Write a program to print Hello World. [Compile and run](https://youtu.be/Idqa30mZbko) it using command prompt.
2. Write a [program to declare a variable](https://youtu.be/PVJwfMH_hxc) named rollNo of integer type. Assign it a value (let say 100) to it and print the following statement **roll no = 100** .
3. Find the result of following expressions. You need to determine the [primitive data type](https://youtu.be/1ydNljiCSX0) of the variable by looking carefully the given expression and initialize variables by any random value.

A. y = x2 + 3x - 7 (print value of y)

B. y = x++ + ++x (print value of x and y)

C. z = x++ - --y - --x + x++ (print value of x ,y and z)

D. z = x && y || !(x || y) (print value of z) [ x, y, z are boolean variables ]

1. Write a program that initializes 2 byte type of variables. Add the values of these variables and store in a byte type of variable. [Note: [primitive down casting](https://youtu.be/CjQ07STtWpQ) is required in this program ] .
2. Write a program that takes user’s name as [command line argument](https://youtu.be/NCYXNGjxEjs) and prints Welcome <entered user name>.
3. Write a program that takes radius of a circle as input. Read the entered radius using [Scanner class](https://youtu.be/8pDFOcWbzXE). Then calculate and print the area and circumference of the circle.
4. Write a program to calculate sum of 5 subject’s marks & find percentage. Take the obtained marks from user using Scanner class. Output should be in this format [ percentage marks = 99 % ]. Use [concatenation operator](https://youtu.be/C7SRqTQZSr0) here.
5. Write a program to find the simple interest. Take the principle amount, rate of interest and time from user using [Scanner class](https://youtu.be/8pDFOcWbzXE).
6. Write a program to read the days (eg. 670 days) as integer value using [Scanner class.](https://youtu.be/8pDFOcWbzXE) Now convert the entered days into complete years, months and days and print them.
7. Write a program to convert temperature from Fahrenheit to Celsius. Take Fahrenheit as input using [Scanner class.](https://youtu.be/8pDFOcWbzXE) [ formula : C= 5\*(f-32)/9 ]
8. Write a program to swap two numbers without using third variable.
9. In a company an employee is paid as under: If his basic salary is less than Rs. 10000, then HRA = 10% of basic salary and DA = 90% of basic salary. If his salary is either equal to or above Rs. 10000, then HRA = Rs. 2000 and DA = 98% of basic salary. If the employee's salary is input by the user write a program to find his gross salary. [ formula : GS= Basic + DA + HRA ]
10. Program to find greatest in 3 numbers. [ once using [if else statement](https://youtu.be/YEXDjvNg6-M) and then using [ternary operator](https://youtu.be/C7SRqTQZSr0) ( [logical operator](https://youtu.be/C7SRqTQZSr0)) ]
11. Program to check that entered year is a leap year or not.
12. Accept person’s gender (character m for male and f for female), age (integer), as input and then check whether person is eligible for marriage or not.
13. Write a program to print table of any entered number [using loop](https://youtu.be/U6gf1JH9UdU).
14. Write a program to reverse a given number.
15. Program to check whether number is prime or not.
16. Calculate series : 12+22+32+42+.........+n2
17. Print all prime numbers between two given numbers. [ [break continue](https://youtu.be/yauIvIlXquc) ]
18. Program to show sum and average of 10 element array. Accept [array elements](https://youtu.be/Un-WMt_QsHM) from user.
19. Sort a ten element [array](https://youtu.be/Un-WMt_QsHM) in descending order.
20. Write a program to reverse the [array](https://youtu.be/Un-WMt_QsHM) elements.
21. Write a program to search an element in the [array](https://youtu.be/Un-WMt_QsHM).
22. Write the program to find the sum of even elements and sum of odd elements present in the [array](https://youtu.be/Un-WMt_QsHM) of integer type.
23. Create an [array](https://youtu.be/Un-WMt_QsHM) of 17 elements in 5 rows. And calculate sum of all elements.
24. Write a program to fine the smallest and greatest number present in the [array](https://youtu.be/Un-WMt_QsHM) of integer type.
25. [Initialize one String type of array](https://youtu.be/FSQxydxHLwY) and print the elements using for each loop.
26. Write a program to print the total number of one-D arrays in a [two-D array](https://youtu.be/w1nQh0Evgyw) and the number of elements in every one-D array present in the [two-D arrays](https://youtu.be/w1nQh0Evgyw).
27. Create an integer type [2-D array](https://youtu.be/w1nQh0Evgyw) of [size [3X3]](https://youtu.be/yC1ux1nSvd0). Take the elements from the user and then calculate the sum of the elements present in the [diagonal](https://youtu.be/WhlZdnaC_Dk).
28. Create a [class](https://youtu.be/qWcl4Ar_4uY) Student with 2 data members’ rno and name. Create one method setData() that takes roll number and student name as parameter and stores them in data members rno and name. Create one more method showData() to print the data member values. Create another [class](https://youtu.be/qWcl4Ar_4uY) ( main [class](https://youtu.be/qWcl4Ar_4uY)) StudentDemo that creates Student class object and calls setData() and showData() methods.
29. Modify the above program (no. 31) to count the no of Student [objects](https://youtu.be/qWcl4Ar_4uY) created. [ In this program [static variable](https://youtu.be/R7GenCGZr_E) is required ]
30. Write a program to demonstrate functionalities of [this keyword in java](https://youtu.be/syjHm5GfnEI).
31. Create a [class](https://youtu.be/qWcl4Ar_4uY) Circle that has two data members, one to store the radius and another to store area and three methods first init() method to input radius from user, second calculateArea() method to calculate area of circle and third display() method to display values of radius and area. Create [class](https://youtu.be/qWcl4Ar_4uY) CircleDemo ( main class) that creates the Circle object and calls init(), calculateArea() and display() methods.
32. Create a class MathOperation that has four [static methods](https://youtu.be/xhVlEWpz8Lw). add() method that takes two integer numbers as parameter and returns the sum of the numbers. subtract() method that takes two integer numbers as parameter and returns the difference of the numbers. multiply() method that takes two integer numbers as parameter and returns the product. power() method that takes two integer numbers as parameter and returns the power of first number to second number. Create another class Demo (main class) that takes the two numbers from the user and calls all four methods of MathOperation class by providing entered numbers and prints the return values of every method.
33. Create a class MathOperation containing [overloaded methods](https://youtu.be/uv1ZDTxapcw) ‘multiply’ to calculate multiplication of following arguments.
    1. two integers
    2. three floats
    3. all elements of array
    4. one double and one integer
34. Create a class Person with properties (name and age) with following features.
    1. Default age of person should be 18.
    2. A person object can be initialized with name and age.
    3. Method to display name and age of person

Create another class PersonDemo ( main class ) that demonstrates the functionalities of Person class by creating Person object and calling methods.

1. Create a class Employee with three data members (empNo, salary and totalSalary) and following features.
   1. Only [parameterized constructor](https://youtu.be/kULXZmsZQFo). [Do not [overload the constructor](https://youtu.be/l8J_ROfYPts)]
   2. totalSalary always represents salary total of all the employees created.
   3. empNo should be auto incremented.
   4. display total employees and totalSalary using a method.

Create another class EmployeeDemo (main class) that creates some Employee objects and calls Employee method to display no. of employees and total of their salaries.

1. Create class Product with three data members (pid, price, quantity) and [parameterized constructor](https://youtu.be/kULXZmsZQFo) that takes values for all three data members.

Create a main method in different class (say ProductDemo) and perform following task:

a. Accept information for five Product objects from user and store objects in an array

b. Find pid of product with highest price.

c. Create a static method (with array of product’s object as argument) in Product class to calculate and return total amount spent on all products. ( amount spent **on single product = price of product \* quantity of product )**

1. Create a class Student having data members name, roll no., age and score. Write a program to accept 10 records of student and store them in an array. And then arrange the student records based on the score group [0-50], [50-65], [65-80], [80-100].
2. Write a program to demonstrate [this() construct](https://youtu.be/bm-LjrQwE1Q) functionality.
3. Create a class Tile to store the edge length of a square tile, and create another class Floor to store length and width of a rectangular floor. Add method totalTiles(Tile t) in Floor class with Tile as argument to calculate the whole number of tiles needed to cover the floor completely.
4. Create a class OneBHK with instance variables roomArea, hallArea and price. Then create default constructor that initializes instance variables with some values and a parameterized constructor that takes values for all instance variables and stores them in instance variables. Now create a method named show() to print OneBHK’s instance variable values.

Create another class TwoBHK which has [(inherites)](https://youtu.be/Xtj8XLWiKlA) all the properties and behaviors of OneBHK and a new instance variable room2Area. Then create default constructor to initialize all 4 instance variables and a parameterized constructor to take the values for initialization of all instance variables. Override show() method to print all data member information.

Write main method in another class (Say Demo) and store three TwoBHK flat’s information and print information using show method. Also print total amount of all flats.

1. Create three classes

* Faculty with two data members facultyId and salary and two methods, one intput() method for accepting facultyId as input and another printSalary() to print salary.
* FullTimeFaculty that [inherits](https://youtu.be/iF6fw004RAw) class Faculty with two data members’ basicSalary and allowance. Override input() method in this class that calls super class inut() method and accepts basicSalary and allowance as input. Salary should not be accepted as input but should be calculated using formula (basicSalary + allowance)
* PartTimeFaculty that [inherits](https://youtu.be/k0oaIxwpdz0) class Faculty with two data members’ workingHours, ratePerHour. [Override](https://youtu.be/2cbzGNLaCtY) input() method in this class that calls super class inut() method and accepts workingHours and ratePerHour as input. Salary should not be accepted as input but should be calculated using formula ( workingHour \* ratePerHour )

1. Create a class Student with two members : rollno and percentage. Create default and parameterized constructors. Create method show() to display information. Create another class CollegeStudent inherits Student class. Add a new member semester to it. Create default and parameterized constructors. [Also override](https://youtu.be/2cbzGNLaCtY) show() method that calls [super](https://youtu.be/saWlv18bw_U) class show() method and displays semester. Create another class SchoolStudent inherits Student class. Add a new member className(eg 12th ,10th etc.) to it. Create default and parameterized constructors. Also [override](https://youtu.be/2cbzGNLaCtY) show() method that calls [super](Aishwary) class show() method and displays className. Create a class( say Demo) with main method that carries out the operation of the project : -- has array to store objects of any class(Student, CollegeStudent or SchoolStudent) --create two CollegeStudent and three SchoolStudent objects and store them inside the array -- display all records from the array -- search record on the basic of rollno and check given rollno is of SchoolStudent or of CollegeStudent. --count how many students are having A grade, if for A grade percentage >75.
2. Create a program to demonstrate the use of [instanceof operator](https://youtu.be/NDuPFInLGCE) or secure [reference down casting](https://youtu.be/jFyDeMseMG8).
3. Create a program to demonstrate [constructor chaining.](https://youtu.be/DuwKsrX9S74)
4. Create an Abstract class Processor with int member variable data and method showData to display data value. Create abstract method process() to define processing of member data.
   1. Create a class Factorial using [abstract class](https://youtu.be/v8iwBW167Tw) Processor to calculate and print factorial of a number by overriding the process method.
   2. Create a class Circle using [abstract class](https://youtu.be/v8iwBW167Tw) Processor to calculate and print area of a circle by overriding the process method.
   3. Create Main class to demonstrate above classes. Ask user to enter choice (factorial or circle area). Also ask data to work upon. Use Processor class [reference](https://youtu.be/I2L4y-ZQfyo) to achieve this mechanism.
5. Create [Interface](https://youtu.be/zkXqaknUUyE) Taxable with members salesTax=7% and incomeTax=10.5%. create abstract method calcTax().
   1. Create class Employee(empId,name,salary) and implement Taxable to calculate incomeTax on yearly salary.
   2. Create class Product(pid,price,quantity) and implement Taxable to calculate salesTax on unit price of product.
   3. Create class for main method(Say XYZ), accept employee information and a product information from user and print income tax and sales tax respectively.
6. Explain the importance of toString() and equals() method of the Object class and override them on class Employee(empId,name,salary).
   1. Create class for main method(say XYZ),and accept five employees information and store in an array. Also ensure if entered empId already exist or not (use equals method).
   2. Display all employee info using toString method.
7. Create a program that helps banks to maintain records. It should have following facilities.
   1. Anybody can create current or saving account with following initial information: account number, name, balance, and branch. o display account detail for a particular accounts.
   2. Display total money deposited in bank.
   3. Allow deposit and withdrawal in an account . d.
   4. For saving account opening balance and minimum balance must be 5000.
   5. For current account opening balance and minimum balance must be 1000.
   6. Can not withdraw the amount from the account that makes balance less than the minimum balance.
8. Input name of a person and count how many vowels it contains. Use String class functions.
9. Input data exactly in the following format, and print sum of all integer values. “67, 89, 23, 67, 12, 55, 66”. (Hint use String class split method and Integer class parseInt method) .
10. [Write a program to reverse the given String](https://youtu.be/sMiEsob6EoQ).
11. [Write a program to count no of words in the String](https://youtu.be/JRYUwMqyfKk).
12. [Write a program to convert very first character of every word in uppercase in a String](https://youtu.be/CVpG67GZ8GE).
13. [Write a program to reverse every word of the String](https://youtu.be/ukl-GvR43Xs).
14. Store name of weekdays in an array (starting from “Sunday” at 0 index). Ask day position from user and print day name. Handle array index out of bound [exception](https://youtu.be/0hRqwT8aX2I) and give proper message if user enter day index outside range (0-6).
15. Create a class Voter(voterId, name, age) with parameterized constructor. The parameterized constructor should throw a [checked exception](https://youtu.be/SZoijVHT53M) if age is less than 18. The message of exception is “invalid age for voter ”
16. Create Interface StudentFee and declare following method. getFee() [throws](https://youtu.be/-CviKKERXDE) InvalidFeeException. This method ask fees from user and [throws exception](https://youtu.be/q_F7Htdxc2s) if user enters invalid or negative fees Create class Student with members (name, fees) and implement the StudentFee Interface.
17. Create a Thread class to print following star (\*) pattern on screen with delay of 1 second between each \* print. Number of lines in the pattern should be passed to the constructor of Thread class. \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* Use this class in main method and ask user to enter number of lines to print.
18. Create a class that checks whether a given number is prime or not using Runnable interface.
19. Write a program to count how many times character ‘t’ occurs in a file.
20. Write a program to count no of words in a text file and average word size.
21. Write a program to count number of bytes in a image file(jpeg/png/gif). Also find how much time it will take to upload the file on server if internet speed is 256 bps(bits per second).
22. Write a program to store your shopping details in a binary file(shopping.dat) with information itemName, price, quantity. (Use ObjectOutputStream to store Item class object).
23. Write a program to read data from shopping.dat file created in above problem and find total money spent on all shopping items. . (Use ObjectInputStream to read Item class object).