### **1. Stud\_Demo. Converted to Array of Objects**

import java.util.Scanner;

class Student {

int rno;

String sname;

double per;

void accept() {

Scanner sc = new Scanner(System.in);

System.out.println("Enter rollno, name & percentage");

rno = sc.nextInt();

sname = sc.next();

per = sc.nextDouble();

}

void display() {

System.out.println("Rollno=" + rno);

System.out.println("Name=" + sname);

System.out.println("Percentage=" + per);

}

}

public class Stud\_Demo {

public static void main(String[] args) {

int n;

Scanner sc = new Scanner(System.in);

System.out.println("Enter the number of students");

n = sc.nextInt();

Student[] students = new Student[n];

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

students[i] = new Student();

students[i].accept();

}

System.out.println("Student Details:");

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

students[i].display();

}

}

}

### **Output:**

Enter the number of students

3

Enter rollno, name & percentage

1

Alice

85.5

Enter rollno, name & percentage

2

Bob

90.2

Enter rollno, name & percentage

3

Charlie

78.9

Student Details:

Rollno=1

Name=Alice

Percentage=85.5

Rollno=2

Name=Bob

Percentage=90.2

Rollno=3

Name=Charlie

Percentage=78.9

### **2. Book. Converted to Array of Objects**

import java.util.Scanner;

class Book {

int bid;

String bname;

String author;

double price;

void accept() {

Scanner sc = new Scanner(System.in);

System.out.println("Enter book id, name, author & price");

bid = sc.nextInt();

sc.nextLine();

bname = sc.nextLine();

author = sc.nextLine();

price = sc.nextDouble();

}

void display() {

System.out.println("Book ID=" + bid);

System.out.println("Book Name=" + bname);

System.out.println("Author=" + author);

System.out.println("Price=" + price);

}

}

public class Main {

public static void main(String[] args) {

int n;

Scanner sc = new Scanner(System.in);

System.out.println("Enter the number of books");

n = sc.nextInt();

Book[] books = new Book[n];

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

books[i] = new Book();

books[i].accept();

}

System.out.println("Book Details:");

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

books[i].display();

}

}

}

### **Output:**

Enter the number of books

2

Enter book id, name, author & price

1

Programming

Herbert Schildt

450.75

Enter book id, name, author & price

2

Cookbook

David Beazley

650.50

Book Details:

Book ID=1

Book Name= Programming

Author=Herbert Schildt

Price=450.75

Book ID=2

Book Name= Cookbook

Author=David Beazley

Price=650.50

### **3. Vehicle. Converted to Array of Objects**

import java.util.Scanner;

class Vehicle {

int vid;

String vanme;

String compname;

String color;

String ownern;

double price;

void accept() {

Scanner sc = new Scanner(System.in);

System.out.println("Enter vehicle id, name, company name, color, owner's name & price");

vid = sc.nextInt();

sc.nextLine();

vanme = sc.nextLine();

compname = sc.nextLine();

color = sc.nextLine();

ownern = sc.nextLine();

price = sc.nextDouble();

}

void display() {

System.out.println("Vehicle ID=" + vid);

System.out.println("Vehicle Name=" + vanme);

System.out.println("Company Name=" + compname);

System.out.println("Color=" + color);

System.out.println("Owner's Name=" + ownern);

System.out.println("Price=" + price);

}

}

public class Main {

public static void main(String[] args) {

int n;

Scanner sc = new Scanner(System.in);

System.out.println("Enter the number of vehicles");

n = sc.nextInt();

Vehicle[] vehicles = new Vehicle[n];

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

vehicles[i] = new Vehicle();

vehicles[i].accept();

}

System.out.println("Vehicle Details:");

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

vehicles[i].display();

}

}

}

### **Output:**

Enter the number of vehicles

2

Enter vehicle id, name, company name, color, owner's name & price

1

Model S

Tesla

Red

Alice

75000.0

Enter vehicle id, name, company name, color, owner's name & price

2

Mustang

Ford

Blue

Bob

55000.0

Vehicle Details:

Vehicle ID=1

Vehicle Name=Model S

Company Name=Tesla

Color=Red

Owner's Name=Alice

Price=75000.0

Vehicle ID=2

Vehicle Name=Mustang

Company Name=Ford

Color=Blue

Owner's Name=Bob

Price=55000.0

### **4. Employee. Converted to Array of Objects**

import java.util.Scanner;

class Employee {

int eid;

String ename;

double salary;

String designation;

void accept() {

Scanner sc = new Scanner(System.in);

System.out.println("Enter employee id, name, salary & designation");

eid = sc.nextInt();

sc.nextLine();

ename = sc.nextLine();

salary = sc.nextDouble();

sc.nextLine();

designation = sc.nextLine();

}

void display() {

System.out.println("Employee ID=" + eid);

System.out.println("Employee Name=" + ename);

System.out.println("Salary=" + salary);

System.out.println("Designation=" + designation);

}

}

public class Main {

public static void main(String[] args) {

int n;

Scanner sc = new Scanner(System.in);

System.out.println("Enter the number of employees");

n = sc.nextInt();

Employee[] employees = new Employee[n];

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

employees[i] = new Employee();

employees[i].accept();

}

System.out.println("Employee Details:");

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

employees[i].display();

}

}

}

### **Output:**

Enter the number of employees

2

Enter employee id, name, salary & designation

1

Alice

50000

Manager

Enter employee id, name, salary & designation

2

Bob

40000

Developer

Employee Details:

Employee ID=1

Employee Name=Alice

Salary=50000.0

Designation=Manager

Employee ID=2

Employee Name=Bob

Salary=40000.0

Designation=Developer

### **5. Area\_Demo. Converted to Array of Objects**

import java.util.Scanner;

class AreaDemo {

double r, A;

void accept(double r) {

this.r = r;

}

double cal\_area() {

A = 3.14 \* r \* r;

return A;

}

}

public class Main {

public static void main(String[] args) {

int n;

Scanner sc = new Scanner(System.in);

System.out.println("Enter the number of records");

n = sc.nextInt();

AreaDemo[] areas = new AreaDemo[n];

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

areas[i] = new AreaDemo();

System.out.println("Enter value of r");

double r = sc.nextDouble();

areas[i].accept(r);

System.out.println("Area=" + areas[i].cal\_area());

}

}

}

### **Output:**

Enter the number of records

2

Enter value of r

5.0

Area=78.5

Enter value of r

7.5

Area=176.625

### **6. Fact\_Demo. Converted to Array of Objects**

import java.util.Scanner;

class Fact\_Demo {

int n, f1 = 1;

void accept(int n) {

this.n = n;

}

int cal\_fact() {

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

f1 \*= i;

}

return f1;

}

}

public class Main {

public static void main(String[] args) {

int n;

Scanner sc = new Scanner(System.in);

System.out.println("Enter the number of records");

int numRecords = sc.nextInt();

Fact\_Demo[] facts = new Fact\_Demo[numRecords];

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

facts[i] = new Fact\_Demo();

System.out.println("Enter value of n");

n = sc.nextInt();

facts[i].accept(n);

System.out.println("Fact=" + facts[i].cal\_fact());

}

}

}

### **Output:**

Enter the number of records

2

Enter value of n

5

Fact=120

Enter value of n

6

Fact=720

**7.Dissarium,Prime,Vowel**

import java.util.Scanner;

class DissariumDemo {

int n;

void accept(int n) {

this.n = n;

}

boolean isDissarium() {

int num = n;

int sum = 0;

int length = String.valueOf(n).length();

while (num > 0) {

int digit = num % 10;

sum += Math.pow(digit, length);

length--;

num /= 10;

}

return sum == n;

}

}

class VowelDemo {

char ch;

void accept(char ch) {

this.ch = ch;

}

boolean isVowel() {

return "AEIOUaeiou".indexOf(ch) != -1;

}

}

class PrimeDemo {

int n;

void accept(int n) {

this.n = n;

}

boolean isPrime() {

if (n <= 1) return false;

for (int i = 2; i <= Math.sqrt(n); i++) {

if (n % i == 0) return false;

}

return true;

}

}

public class CombinedDemo {

public static void main(String[] args) {

Scanner sc = new Scanner(System.in);

System.out.println("Enter the number of Dissarium checks");

int dissariumRecords = sc.nextInt();

DissariumDemo[] dissariums = new DissariumDemo[dissariumRecords];

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

dissariums[i] = new DissariumDemo();

System.out.println("Enter a number");

int n = sc.nextInt();

dissariums[i].accept(n);

if (dissariums[i].isDissarium()) {

System.out.println(n + " is a Dissarium number");

} else {

System.out.println(n + " is not a Dissarium number");

}

}

System.out.println("Enter the number of Vowel checks");

int vowelRecords = sc.nextInt();

VowelDemo[] vowels = new VowelDemo[vowelRecords];

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

vowels[i] = new VowelDemo();

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

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

vowels[i].accept(ch);

if (vowels[i].isVowel()) {

System.out.println(ch + " is a vowel");

} else {

System.out.println(ch + " is not a vowel");

}

}

System.out.println("Enter the number of Prime checks");

int primeRecords = sc.nextInt();

PrimeDemo[] primes = new PrimeDemo[primeRecords];

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

primes[i] = new PrimeDemo();

System.out.println("Enter a number");

int n = sc.nextInt();

primes[i].accept(n);

if (primes[i].isPrime()) {

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

} else {

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

}

}

}

}

**Output:**

Enter the number of Dissarium checks

2

Enter a number

175

175 is a Dissarium number

Enter a number

89

89 is a Dissarium number

Enter the number of Vowel checks

2

Enter a character

a

a is a vowel

Enter a character

b

b is not a vowel

Enter the number of Prime checks

2

Enter a number

5

5 is a prime number

Enter a number

8

8 is not a prime number

**8. Maximum of Two Numbers**

import java.util.Scanner;

class MaxDemo {

int num1, num2;

void accept(int num1, int num2) {

this.num1 = num1;

this.num2 = num2;

}

int findMax() {

return (num1 > num2) ? num1 : num2;

}

}

public class MainMax {

public static void main(String[] args) {

Scanner sc = new Scanner(System.in);

System.out.println("Enter the number of records");

int n = sc.nextInt();

MaxDemo[] maxArray = new MaxDemo[n];

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

maxArray[i] = new MaxDemo();

System.out.println("Enter two numbers");

int num1 = sc.nextInt();

int num2 = sc.nextInt();

maxArray[i].accept(num1, num2);

System.out.println("Max of " + num1 + " and " + num2 + " is " + maxArray[i].findMax());

}

}

}

**Output:**

Enter the number of records

2

Enter two numbers

5 10

Max of 5 and 10 is 10

Enter two numbers

20 15

Max of 20 and 15 is 20

**9.Factorial Calculation**

import java.util.Scanner;

class FactDemo {

int n;

void accept(int n) {

this.n = n;

}

int calculateFactorial() {

int fact = 1;

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

fact \*= i;

}

return fact;

}

}

public class MainFact {

public static void main(String[] args) {

Scanner sc = new Scanner(System.in);

System.out.println("Enter the number of records");

int n = sc.nextInt();

FactDemo[] factArray = new FactDemo[n];

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

factArray[i] = new FactDemo();

System.out.println("Enter a number");

int num = sc.nextInt();

factArray[i].accept(num);

System.out.println("Factorial of " + num + " is " + factArray[i].calculateFactorial());

}

}

}

**Output:**

Enter the number of records

2

Enter a number

5

Factorial of 5 is 120

Enter a number

4

Factorial of 4 is 24

**10.REVERSE,ARMSTRONG,MAGIC,MAX**

import java.util.Scanner;

class NumberUtils {

private int num;

NumberUtils(int num) {

this.num = num;

}

int reverseNumber() {

int reversed = 0, original = num;

while (num != 0) {

int digit = num % 10;

reversed = reversed \* 10 + digit;

num /= 10;

}

num = original;

return reversed;

}

boolean isArmstrong() {

int sum = 0, original = num, digits = String.valueOf(num).length();

while (num != 0) {

int digit = num % 10;

sum += Math.pow(digit, digits);

num /= 10;

}

num = original;

return sum == original;

}

boolean isMagicNumber() {

int sum = num;

while (sum >= 10) {

int tempSum = 0;

while (sum != 0) {

tempSum += sum % 10;

sum /= 10;

}

sum = tempSum;

}

return sum == 1;

}

static int maxOfThree(int a, int b, int c) {

return Math.max(Math.max(a, b), c);

}

}

public class MainNumberUtils {

public static void main(String[] args) {

Scanner sc = new Scanner(System.in);

System.out.println("Enter the number of records:");

int n = sc.nextInt();

NumberUtils[] numArray = new NumberUtils[n];

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

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

int num = sc.nextInt();

numArray[i] = new NumberUtils(num);

System.out.println("Reverse of " + num + " is " + numArray[i].reverseNumber());

System.out.println(num + " is " + (numArray[i].isArmstrong() ? "an Armstrong number" : "not an Armstrong number"));

System.out.println(num + " is " + (numArray[i].isMagicNumber() ? "a Magic number" : "not a Magic number"));

System.out.println("Enter two more numbers to find the maximum of three:");

int num2 = sc.nextInt();

int num3 = sc.nextInt();

System.out.println("Max of " + num + ", " + num2 + ", and " + num3 + " is " + NumberUtils.maxOfThree(num, num2, num3));

}

}

}

**Output:**

Enter the number of records:

1

Enter a number:

153

Reverse of 153 is 351

153 is an Armstrong number

153 is not a Magic number

Enter two more numbers to find the maximum of three:

20

30

Max of 153, 20, and 30 is 153

**11.ParaMethodDemo with Array of Objects**

import java.util.Scanner;

class ParaMethodDemo {

int flag = 0, n, x, sum = 0, p, f1 = 1, i;

void accept(int n) {

this.n = n;

}

void pattern() {

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

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

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

}

System.out.println();

}

}

void prime() {

for (i = 2; i <= (n / 2); i++) {

if (n % i == 0) {

flag = 1;

break;

}

}

if (flag == 0)

System.out.println(n + " is prime");

else

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

}

String pal() {

p = n;

while (p > 0) {

int n1 = p % 10;

p = p / 10;

sum = (sum \* 10) + n1;

}

if (sum == n)

return n + " is a palindrome";

else

return n + " is not a palindrome";

}

int power(int x) {

this.x = x;

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

f1 = f1 \* x;

}

return f1;

}

}

public class MainParaMethodDemo {

public static void main(String[] args) {

Scanner sc = new Scanner(System.in);

System.out.println("Enter the number of records:");

int n1 = sc.nextInt();

ParaMethodDemo[] array = new ParaMethodDemo[n1];

for (int i = 0; i < n1; i++) {

array[i] = new ParaMethodDemo();

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

int n = sc.nextInt();

array[i].accept(n);

array[i].pattern();

array[i].prime();

System.out.println(array[i].pal());

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

int x = sc.nextInt();

System.out.println("Power = " + array[i].power(x));

}

}

}

**Output:**

Enter the number of records:

2

Enter value of n:

3

1

1 2

1 2 3

3 is prime

3 is a palindrome

Enter value of x:

2

Power = 8

Enter value of n:

5

1

1 2

1 2 3

1 2 3 4

1 2 3 4 5

5 is prime

5 is a palindrome

Enter value of x:

3

Power = 243

**12.Classes with Array of Objects**

**Student Class**

import java.util.Scanner;

class Student {

int rno;

String sname;

double per;

void accept() {

Scanner sc = new Scanner(System.in);

System.out.println("Enter rollno, name, and percentage:");

rno = sc.nextInt();

sname = sc.next();

per = sc.nextDouble();

}

void display() {

System.out.println("Rollno = " + rno);

System.out.println("Name = " + sname);

System.out.println("Percentage = " + per);

}

}

class MainStudent {

public static void main(String[] args) {

Scanner sc = new Scanner(System.in);

System.out.println("Enter number of students:");

int n = sc.nextInt();

Student[] students = new Student[n];

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

students[i] = new Student();

students[i].accept();

students[i].display();

}

}

}

**Output:**

Enter number of students:

2

Enter rollno, name, and percentage:

101

Alice

85.5

Rollno = 101

Name = Alice

Percentage = 85.5

Enter rollno, name, and percentage:

102

Bob

90.0

Rollno = 102

Name = Bob

Percentage = 90.0

**Book Class**

import java.util.Scanner;

class Book {

int bid;

String bname, author;

double price;

void accept() {

Scanner sc = new Scanner(System.in);

System.out.println("Enter book id, name, author, and price:");

bid = sc.nextInt();

bname = sc.next();

author = sc.next();

price = sc.nextDouble();

}

void display() {

System.out.println("Book ID = " + bid);

System.out.println("Book Name = " + bname);

System.out.println("Author = " + author);

System.out.println("Price = " + price);

}

}

class MainBook {

public static void main(String[] args) {

Scanner sc = new Scanner(System.in);

System.out.println("Enter number of books:");

int n = sc.nextInt();

Book[] books = new Book[n];

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

books[i] = new Book();

books[i].accept();

books[i].display();

}

}

}

**Output:**

Enter number of books:

2

Enter book id, name, author, and price:

1

JavaBasics

John

500.0

Book ID = 1

Book Name = JavaBasics

Author = John

Price = 500.0

Enter book id, name, author, and price:

2

AdvancedJava

Alice

750.0

Book ID = 2

Book Name = AdvancedJava

Author = Alice

Price = 750.0

**Vehicle Class**

import java.util.Scanner;

class Vehicle {

int vid;

String vanme, compname, color, ownern;

double price;

void accept() {

Scanner sc = new Scanner(System.in);

System.out.println("Enter vehicle id, name, company, color, owner name, and price:");

vid = sc.nextInt();

vanme = sc.next();

compname = sc.next();

color = sc.next();

ownern = sc.next();

price = sc.nextDouble();

}

void display() {

System.out.println("Vehicle ID = " + vid);

System.out.println("Vehicle Name = " + vanme);

System.out.println("Company Name = " + compname);

System.out.println("Color = " + color);

System.out.println("Owner Name = " + ownern);

System.out.println("Price = " + price);

}

}

class MainVehicle {

public static void main(String[] args) {

Scanner sc = new Scanner(System.in);

System.out.println("Enter number of vehicles:");

int n = sc.nextInt();

Vehicle[] vehicles = new Vehicle[n];

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

vehicles[i] = new Vehicle();

vehicles[i].accept();

vehicles[i].display();

}

}

}

**Output:**

Enter number of vehicles:

2

Enter vehicle id, name, company, color, owner name, and price:

101

Sedan

Toyota

Red

John

20000.0

Vehicle ID = 101

Vehicle Name = Sedan

Company Name = Toyota

Color = Red

Owner Name = John

Price = 20000.0

Enter vehicle id, name, company, color, owner name, and price:

102

SUV

Honda

Black

Alice

30000.0

Vehicle ID = 102

Vehicle Name = SUV

Company Name = Honda

Color = Black

Owner Name = Alice

Price = 30000.0