Analyze Of Hands-On Introduction to Java

1.Initialize an integer variable `number` with the value 100. Then print the value of `number` to the console.

Analysis

In this program, we have initialized an integer variable `number` with the value 100.

Code

```
package com.hands_on;

public class PrintANumber {
    public static void main(String[] args) {
        int number = 100;
        System.out.println(number);
    }
}
```

Output

```
100
```

---

2. Initialize two integer variables `six` and `four` with the values as the name says. Then, print the values of `six` and `four` to the console.

Analysis

In this program, we have initialized two integer variables `six` and `four` with the values 6 and 4 respectively.

Code

```
package com.hands_on;

public class PrintSixAndFour {
    public static void main(String[] args) {
        byte six = 6, four = 4;
        System.out.println(six+" "+four);
    }
}
```

Output

```
6 4
```

---

3. Initialize a byte variable `age` with the value 30. Then, print the value of `age` to the console.

Analysis

In this program, we have initialized a byte variable `age` with the value 30.

Code

```
package com.hands_on;
import java.util.Scanner;

public class DisplayAge {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        byte age = scanner.nextByte();
        System.out.println(age);
    }
}
```

Output

```
30
```

---

4. Declare three integer variables named `hundred`, `twoHundred`, and `threeHundred`, and initialize them with the values 10, 2000, and -30000 respectively. Then, reassign them with the corresponding number names. Finally, print the values of all three variables.

Analysis

In this program, we have declared three integer variables `hundred`, `twoHundred`, and `threeHundred`, and initialized them with the values 10, 2000, and -30000 respectively. Then, we reassigned them with the corresponding number names.

Code

```
package com.hands_on;
import java.util.Scanner;

public class GetThreeUserInput {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        short hundred = 10, twoHundred = 2000, threeHundred = -30000;
        hundred = scanner.nextShort();
        twoHundred = scanner.nextShort();
        threeHundred = scanner.nextShort();
        System.out.println(hundred+"\n"+twoHundred+"\n"+threeHundred);
    }
}
```

Output

```
100 200 300
```

5. Declare a variable `bookPrice` (Choose the right datatype). Assign the value 150.50 to `bookPrice`. Print the price. Now, re-assign a value to `bookPrice` then print `bookPrice`.

Analysis

In this program, we have declared a double variable `bookPrice` and assigned the value 150.50 to `bookPrice`. Then, we reassigned a value to `bookPrice` and printed `bookPrice`.

Code

```
package com.hands_on;
import java.util.Scanner;

public class ChangeBookPrice {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        double price = 150.50;
        System.out.println(price);
        price = scanner.nextDouble();
        System.out.println(price);
    }
}
```

Output

```
150.50
200.50
```

6. Declare the variables for the marks of the subjects `Tamil`, `English`, and `French`. Initialize or assign them with the scores 95,99 and 100 respectively. Print them in separate lines.

Analysis

In this program, we have declared three integer variables `Tamil`, `English`, and `French` and initialized them with the scores 95, 99, and 100 respectively. Then, we printed them in separate lines.

Code

```
package com.hands_on;

public class DisplaySubjectMarks {
    public static void main(String[] args) {
        int Tamil = 95, English = 99, French = 100;
        System.out.println(Tamil+" "+English+" "+French);
    }
}
```

Output

```
95 99 100
```

---

7. Create two variables to store a student's name and his/her age. Assign/initialize them with the appropriate values and display the data.

Analysis

In this program, we have created two variables to store a student's name and his/her age. We have assigned/initialized them with the appropriate values and displayed the data.

Code

```
package com.hands_on;
import java.util.Scanner;

public class DisplayStudentNameAndAge {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        String Student = scanner.nextLine();
        int age = scanner.nextInt();
        System.out.println(Student + "
" + age);
    }
}
```

Output

```
Shabari K S
21
```

---

8. Create the variables for a player's name, age, height in cm, weight in kg, rank, and mobile number, and assign the values of your choice. Display the player detail. (byte, short, int, double, String datatypes can be used).

Analysis

In this program, we have created the variables for a player's name, age, height in cm, weight in kg, rank, and mobile number, and assigned the values of our choice. We have displayed the player detail.

Code

```
package com.hands_on;

import java.util.Scanner;
```

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

        Scanner scanner = new Scanner(System.in);

        String playerName = scanner.nextLine();
        int age = scanner.nextInt();
        double height = scanner.nextDouble();
        double weight = scanner.nextDouble();
        String rank = scanner.nextLine();
        int mobileNumber = scanner.nextInt();

        System.out.println("Name = "+playerName);
        System.out.println("Age = "+age);
        System.out.println("Height = "+height);
        System.out.println("Weight = "+weight);
        System.out.println("Rank = "+rank);
        System.out.println("Mobile Number = "+mobileNumber);
    }
}
```

Output

```
Shabari K S
21
170
60
elite
1234567890

Name = Shabari K S
Age = 21
Height = 170.0
Weight = 60.0
Rank = elite
Mobile Number = 1234567890
```

9. Read a person's name first, read another person and another. Greet the first person first, the third person second and the second person last. If `Chloe` , `Joey` & `Zoe` are the inputs, then the output will be `Welcome Chloe! Welcome Zoe! Welcome Joey too!`

Analysis

In this program, we have read a person's name first, read another person and another. We have greeted the first person first, the third person second, and the second person last.

Code

```
package com.hands_on;

import java.util.Scanner;

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

        String firstPerson = sc.nextLine();
        String secondPerson = sc.nextLine();
        String thirdPerson = sc.nextLine();

        System.out.println("Welcome " + firstPerson + "!");
        System.out.println("Welcome " + thirdPerson + "!");
        System.out.println("Welcome " + secondPerson + "!");
    }
}
```

Output

```
Chloe
Joey
Zoe
Welcome Chloe!
```

```
Welcome Zoe!
Welcome Joey!
```

---

10. Write a Java program to add 8 to the given number and then divide it by 3. Now, the modulus of the quotient is taken with 5, and then multiply the resultant value by 5. Display the result.

Analysis

In this program, we have added 8 to the given number and then divided it by 3. Now, the modulus of the quotient is taken with 5, and then multiplied the resultant value by 5.

Code

```java
package com.hands_on;

import java.util.Scanner;

public class MathOperation {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        int number = scanner.nextInt();
        int result = (((number + 3) / 3 ) % 5)*5;
        System.out.println(result);
    }
}
```

Output

```
10
20
```

---

11. Write a Java program to accept 3 sides of triangle from user and print area of triangle as an output. (Library method can be used to find the square root)

Analysis

In this program, we have accepted 3 sides of a triangle from the user and printed the area of the triangle as an output.

Code

```
package com.hands_on;

import java.util.Scanner;

public class AreaOfTriangle {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        int a = scanner.nextInt();
        int b = scanner.nextInt();
        int c = scanner.nextInt();

        double semiPerimeter = (double) (a + b + c) / 2;
        double areaOfTriangle = Math.sqrt(
                                    semiPerimeter * (semiPerimeter - a)
                                    * (semiPerimeter - b) * (semiPerimeter -
                                );
        System.out.println("Area of Triangle : "+areaOfTriangle);
    }
}
```

Output

```
3 4 5
Area of Triangle : 6.0
```

12. A factory-manufactured LED bulbs on the first day. On the second day, it made CFL bulbs. How many bulbs did the factory make altogether? Counts are the input

Analysis

In this program, we have taken the input of the number of LED and CFL bulbs manufactured by the factory on the first and second days. Then, we have calculated the total number of bulbs manufactured by the factory.

Code

```
package com.hands_on;

import java.util.Scanner;

public class CountLEDAndCFLBulb {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        int dayOne = scanner.nextInt();
        int dayTwo = scanner.nextInt();
        System.out.println(dayOne+dayTwo);
    }
}
```

Output

```
100 200
300
```

---

13. Suppose the values of variables 'a' and 'b' are 6 and 8 respectively, write programs to swap the values of the two variables.

1. **First program by using a third variable**

2. **Second program without using any third variable (use arithmetic operators)**
3. **Third program using using XOR operator**

Analysis

In this program, we have swapped the values of two variables `a` and `b` using three different methods.

1. **First program by using a third variable**

Code

```java
package com.hands_on;
import java.util.Scanner;
public class SwappingUsingThirdVariable {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        int a = scanner.nextInt();
        int b = scanner.nextInt();

        int temp = a;
        a = b;
        b = temp;

        System.out.println(a + " " + b);
    }
}
```

Output

```
6 8
8 6
```

2. **Second program without using any third variable (use arithmetic operators)**

Code

```java
package com.hands_on;
```

```java
import java.util.Scanner;

public class SwappingWithOutThirdVariable {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        int a = scanner.nextInt();
        int b = scanner.nextInt();

        a = a + b;
        b = a - b;
        a = a - b;

        System.out.println(a + " " + b);
    }
}
```

Output

```
6 8
8 6
```

3. **Third program using using XOR operator**

Code

```java
package com.hands_on;

import java.util.Scanner;

public class SwappingWithOutThirdVariableAndArithmeticOperator {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        int a = scanner.nextInt();
        int b = scanner.nextInt();

        a = a ^ b;
        b = a ^ b;
        a = a ^ b;

        System.out.println(a + " " + b);
```

```
    }
}
```

Output

```
6 8
8 6
```

14.Assist the teacher in analyzing the students' fruit preferences recorded as follows:

1. **Determine the total number of students in the school who like oranges.**
2. **Determine the total number of students in the school who like mangoes.**
3. **Calculate the total number of students in the school overall.**
4. **Determine whether the number of girls exceeds the number of boys. State 'true' or 'false'.**

Student	Orange	Mango	Total
Girls	136	240	-
Boys	128	243	-
Total	-	-	-

Analysis

In this program, we have analyzed the students' fruit preferences recorded as follows:

1. Determine the total number of students in the school who like oranges.
2. Determine the total number of students in the school who like mangoes.
3. Calculate the total number of students in the school overall.
4. Determine whether the number of girls exceeds the number of boys. State 'true' or 'false'.

Code

```
package com.hands_on;
```

```java
public class TeacherAnalysis {
    public static void main(String[] args) {
        int girlsOrange = 136;
        int boysOrange = 128;
        int girlsMango = 240;
        int boysMango = 243;

        int totalOrange = girlsOrange + boysOrange;
        int totalMango = girlsMango + boysMango;
        int totalStudents = totalOrange + totalMango;
        int totalBoys = boysOrange + boysMango;
        int totalGirls = girlsOrange + girlsMango;

        System.out.println(
            "Total number of students in the school who like oranges: "
            + totalOrange
        );
        System.out.println(
            "Total number of students in the school who like mangoes: "
            + totalMango
        );
        System.out.println(
            "Total number of students in the school overall: "
            + totalStudents
        );
        System.out.println(
            "Whether the number of girls exceeds the boys: "
            + (totalGirls > totalBoys)
        );
    }
}
```

Output

```
Total number of students in the school who like oranges: 264
Total number of students in the school who like mangoes: 483
Total number of students in the school overall: 747
Whether the number of girls exceeds the boys: true
```

15. Declare four variables numberOne, numberTwo, numberThree, and numberFour of integer type. Assign the values of your choice for the variables numberOne, numberTwo and numberThree. Assign 1000 to numberFour. Print the values. Now re-assign the values as follows to print,

1. **numberOne's value to numberTwo**
2. **numberTwo's value to numberThree**
3. **numberThree's value to numberFour**
4. **100 to numberOne**

Analysis

In this program, we have declared four integer variables `numberOne`, `numberTwo`, `numberThree`, and `numberFour`. We have assigned the values of our choice for the variables `numberOne`, `numberTwo`, and `numberThree`. We have assigned 1000 to `numberFour`. We have printed the values and then reassigned the values as follows:

1. `numberOne`'s value to `numberTwo`
2. `numberTwo`'s value to `numberThree`
3. `numberThree`'s value to `numberFour`
4. 100 to `numberOne`

Code

```
package com.hands_on;

public class SwappingValuesOfFourVariable {
    public static void main(String[] args) {
        int numberOne = 10, numberTwo = 20,
            numberThree = 30, numberFour = 1000;
        System.out.println(
            numberOne + " " + numberTwo + " "
            + numberThree + " " + numberFour
        );
        numberFour = numberThree;
        numberThree = numberTwo;
        numberTwo = numberOne;
```

```
        numberOne = 100;
        System.out.println(
            numberOne + " " + numberTwo + " "
            + numberThree + " " + numberFour
        );
    }
}
```

Output

```
10 20 30 1000
100 10 20 30
```

---

16. Write a Java application that takes a duration in minutes as input and calculates the equivalent duration in years and days.

Analysis

In this program, we have taken the duration in minutes as input and calculated the equivalent duration in years and days.

Code

```
package com.hands_on;

import java.util.Scanner;

public class DurationInYearAndDay {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        System.out.println("Enter the duration in minutes: ");
        int minutes = scanner.nextInt();
        int days = minutes / 1440;
        int years = days / 365;
        days = days % 365;
        System.out.println("Years: " + years + " Days: " + days);
```

```
    }
}
```

Output

```
Enter the duration in minutes:
100029391
Years: 190 Days: 114
```

---

17. Write a Java program to reverse a 3-digit number.

Analysis

In this program, we have reversed a 3-digit number.

Code

```
package com.hands_on;

import java.util.Scanner;

public class ReverseThreeDigitNumber {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        int number = scanner.nextInt();
        int reverse = 0;
        while (number != 0) {
            int digit = number % 10;
            reverse = reverse * 10 + digit;
            number /= 10;
        }
        System.out.println(reverse);
    }
}
```

Output

```
123
321
```

---

18. The total number of students in a class are 90 out of which 45 are boys. If 50% of the total students secured grade 'A' out of which 20 are boys, then write a program to calculate the total number of girls getting grade 'A'.

Analysis

In this program, we have calculated the total number of students in a class who secured grade 'A'.

Code

```java
package com.hands_on;
public class GradeCalculator {
    public static void main(String[] args) {
        int totalStudents = 90;
        int totalBoys = 45;
        int boysWithGradeA = 20;

        // Calculate total students with grade 'A'
        int totalGradeA = totalStudents / 2;

        // Calculate total girls with grade 'A'
        int girlsWithGradeA = totalGradeA - boysWithGradeA;

        System.out.println(
            "Total girls getting grade 'A': " + girlsWithGradeA
        );
    }
}
```

Output

```
Total girls getting grade 'A': 25
```

19. Write a Java program to calculate Net Salary. User must input Basic Salary and Output should be net salary calculated based on following allowances:

Allowances:

```
DA = 70% of Basic Salary

HRA = 7% of Basic Salary

MA = 2% of Basic Salary

TA = 4% of Basic Salary
```

Deduction:

```
PF = 12% of Basic Salary

Income/professional tax = User Input (e.g., 500)

Net Salary = Basic Salary + Allowances - Deduction
```

Analysis

In this program, we have calculated the net salary based on the allowances and deductions.

Code

```java
package com.hands_on;

import java.util.Scanner;

public class NetSalaryCalculator {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        System.out.println("Enter the Basic Salary: ");
```

```
        double basicSalary = scanner.nextDouble();
        System.out.println("Enter the Income/professional tax: ");
        double tax = scanner.nextDouble();

        double DA = 0.7 * basicSalary;
        double HRA = 0.07 * basicSalary;
        double MA = 0.02 * basicSalary;
        double TA = 0.04 * basicSalary;
        double PF = 0.12 * basicSalary;

        double netSalary = basicSalary + DA + HRA + MA + TA - PF - tax;
        System.out.println("Net Salary: " + netSalary);
    }
}
```

Output

```
Enter the Basic Salary:
10000
Enter the Income/professional tax:
500
Net Salary: 16600.0
```

---

20. Anisha and Raja took their common pocket money to the market. Anisha bought Apples and Raju bought Bananas. On their way back they saw a Magic Money Vending Machine which gives the triple of the money deposited. They both tried with all the balance amount that they had. Now write a program to,

1. **Print the amount, they spent together in the market**
2. **Print the final amount that they had when they reach home**
3. **Print the amount they deposited in the magic machine**

`Inputs` : Pocket money, Apple cost, Banana cost

Analysis

In this program, we have calculated the amount spent by Anisha and Raja in the market, the final amount they had when they reached home, and the amount they deposited in the magic machine.

Code

```
package com.hands_on;

import java.util.Scanner;

public class MagicMoneyVendingMachine {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        System.out.println("Enter the Pocket Money: ");
        double pocketMoney = scanner.nextDouble();
        System.out.println("Enter the Apple cost: ");
        double appleCost = scanner.nextDouble();
        System.out.println("Enter the Banana cost: ");
        double bananaCost = scanner.nextDouble();

        double amountSpent = appleCost + bananaCost;
        double finalAmount = pocketMoney - amountSpent;
        double depositAmount = finalAmount * 3;

        System.out.println("Amount spent in the market: " + amountSpent);
        System.out.println("Final amount when they reach home: " + finalAmoun
        System.out.println("Amount deposited in the magic machine: " + deposi
    }
}
```

Output

```
Enter the Pocket Money:
1000
Enter the Apple cost:
200
Enter the Banana cost:
300
Amount spent in the market: 500.0
```

```
Final amount when they reach home: 500.0
Amount deposited in the magic machine: 1500.0
```

---

21. A cashier in a shop has currency notes of denominations 10,50 and 100. If the amount to be returned is the input, find the total number of currency notes of each denomination that the cashier should give to the customer. Write a program to accomplish the above task. Assume that the input is in 10’s multiples.

Analysis

In this program, we have calculated the total number of currency notes of each denomination that the cashier should give to the customer.

Code

```java
package com.hands_on;

import java.util.Scanner;

public class CurrencyNotes {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        System.out.println("Enter the amount: ");
        int amount = scanner.nextInt();

        int hundredNotes = amount / 100;
        int fiftyNotes = (amount % 100) / 50;
        int tenNotes = ((amount % 100) % 50) / 10;

        System.out.println(
            "100 Notes: " + hundredNotes + "\n" +
            "50 Notes: " + fiftyNotes + "\n" +
            "10 Notes: " + tenNotes
        );
```

```
    }
}
```

Output

```
Enter the amount:
450
100 Notes: 4
50 Notes: 1
10 Notes: 0
```

---

22. Electricity bill calculator: Calculate the bill for 30 days based on the given below data.

1. **There are 2 fans of 60W each. Usage of each fan is 6 hours per day.**
2. **There are 3 lights of 40W each. Usage of each light is 8 hours per day.**
3. **For the other electrical appliances, the total consumption per day is 3000W.**
4. **Cost of 1 unit is Rs.6.00**

Analysis

In this program, we have calculated the electricity bill for 30 days based on the given data.

Code

```
package com.hands_on;

public class ElectricityBillCalculator {
    public static void main(String[] args) {
        int fanPower = 60;
        int fanUsage = 6;
        int lightPower = 40;
        int lightUsage = 8;
        int otherPower = 3000;
        int days = 30;
        double costPerUnit = 6.00;
```

```
        double fanConsumption = 2 * fanPower * fanUsage * days;
        double lightConsumption = 3 * lightPower * lightUsage * days;
        double otherConsumption = otherPower * days;
        double totalConsumption = fanConsumption + lightConsumption +
                                  otherConsumption;
        double bill = totalConsumption / 1000 * costPerUnit;

        System.out.println("Electricity Bill: " + bill);
    }
}
```

Output

```
Electricity Bill: 842.40
```

---

23. Write a Java program to check whether the given number is odd or even. Don't use comparison operator and decision statement.

Analysis

In this program, we have checked whether the given number is odd or even without using a comparison operator and decision statement.

Code

```
package com.hands_on;

import java.util.Scanner;

public class EvenOrOdd {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        System.out.println("Enter the number: ");
        int number = scanner.nextInt();

        String[] result = {"Even", "Odd"};
        System.out.println(result[number & 1]);
```

```
    }
}
```

Output

```
Enter the number:
10
Even
```

---

24. Write a Java program to detect if two integers have opposite signs or not. Don't use relational operator.

Analysis

In this program, we have detected whether two integers have opposite signs or not without using a relational operator.

Code

```java
package com.hands_on;

import java.util.Scanner;

public class OppositeSign {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        System.out.println("Enter the first number: ");
        int number1 = scanner.nextInt();
        System.out.println("Enter the second number: ");
        int number2 = scanner.nextInt();

        String[] res = {"Not opposite signs", "Opposite signs"};
        System.out.println(res[((number1 ^ number2)>>31) & 1]);
    }
}
```

Output

```
Enter the first number:
-10
Enter the second number:
20
Opposite signs
```

---

25. Write a Java program that increments a given number. Don't use arithmetic operators.

Analysis

In this program, we have incremented a given number without using arithmetic operators.

Code

```java
package com.hands_on;

import java.util.Scanner;

public class IncrementNumber {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        System.out.println("Enter the number: ");
        int number = scanner.nextInt();

        int incrementedNumber = -~number;
        System.out.println("Incremented Number: " + incrementedNumber);
    }
}
```

Output

```
Enter the number:
10
```

```
Incremented Number: 11
```
