**Assignment Problems & solutions:**

**Java Basics:**

**Jeevika B**

**2K21CSE055**

**Control Flow Statements:**

**Level 1:**

**Easy:**

**1. Get employee details, wages, and number of days worked and find total salary.**

**package** CondiPractice;

**import** java.util.\*;

**class** EmployeeSalary {

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

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

        System.***out***.print("Enter employee name: ");

        String name = sc.next();

        System.***out***.print("Enter wages per day: ");

**double** wages = sc.nextDouble();

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

**int** days = sc.nextInt();

**double** totalSalary = wages \* days;

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

    }

}

Output:

Enter employee name:

jeev

Enter wages per day: 800

Enter number of days worked: 25

Total Salary: 20000.0

**2. Check whether the given number is a divisor of 7 using a simple if statement.**

**package** CondiPractice;

**import** java.util.\*;

**public** **class** DivisorofSeven {

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

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

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

**int** num = sc.nextInt();

**if** (num % 7 == 0) {

            System.***out***.println(num + " is a divisor of 7");

        }

    }

}

Output:

Enter a number: 49

49 is a divisor of 7

**3. Use switch case to check if the entered character is a vowel, consonant, or symbol.**

**package** CondiPractice;

**import** java.util.\*;

**public** **class** CharacterCheck {

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

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

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

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

**switch** (Character.*toLowerCase*(ch)) {

**case** 'a': **case** 'e': **case** 'i': **case** 'o': **case** 'u':

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

**break**;

**default**:

**if** (Character.*isLetter*(ch))

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

**else**

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

        }

    }

}

Output:

Enter a character: a

Vowel

**4. Evaluate the series 1+2+3+…+i using do-while loop.**

**package** CondiPractice;

**import** java.util.\*;

**public** **class** SumSeries {

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

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

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

**int** i = sc.nextInt(), sum = 0, num = 1;

**do** {

            sum += num;

            num++;

        } **while** (num <= i);

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

    }

}

Output:

Enter the value of i: 5

Sum: 15

**5. Print alphabets in the given pattern using a for loop.**

**package** CondiPractice;

**public** **class** AlphabetPattern {

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

**for** (**char** a = 'a', b = 'z'; a <= 'm'; a++, b--) {

            System.***out***.print(a + "" + b + " ");

        }

**for** (**char** a = 'n', b = 'm'; a <= 'z'; a++, b--) {

            System.***out***.print(a + "" + b + " ");

        }

    }

}

--------------------------------------------------------------------------------------------

char ch1=’a’; char ch2=’z’;

for(int i=0;i<26;i++){

System.out.println(ch1++ + “” );

System.out.println(ch2-- + “” );

}

Output:

az by cx dw ev fu gt hs ir jq kp lo mn nm ol pk qj ri sh tg uf ve wd xc yb za

**6. Read an integer continuously and display "Hello" as many times as the value of the integer.**

**package** CondiPractice;

**import** java.util.\*;

**public** **class** PrintHello {

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

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

**int** count, total = 0;

**while** (**true**) {

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

            count = sc.nextInt();

**if** (count < 0) **break**;

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

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

                total++;

            }

        }

    }

}

Output:

Enter a number: 5

Hello

Hello

Hello

Hello

Hello

**7. Check whether the blood donor is eligible or not using an if statement.**

**package** CondiPractice;

**import** java.util.\*;

**public** **class** BloodDonation {

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

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

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

**int** age = sc.nextInt();

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

**int** weight = sc.nextInt();

**if** (age > 18 && age < 55 && weight > 45) {

            System.***out***.println("Eligible for blood donation");

        } **else** {

            System.***out***.println("Not eligible for blood donation");

        }

    }

}

Output:

Enter age: 22

Enter weight: 54

Eligible for blood donation

**8. Check whether the given character is an Alphabet, Digit, or Special Symbol.**

**package** CondiPractice;

**import** java.util.\*;

**public** **class** CharacterType {

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

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

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

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

**if** (Character.*isLetter*(ch)) {

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

        } **else** **if** (Character.*isDigit*(ch)) {

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

        } **else** {

            System.***out***.println("Special Symbol");

        }

    }

}

Output:

Enter a character: j

Alphabet

**9. Print the sum of digits of a given number.**

**package** CondiPractice;

**import** java.util.\*;

**public** **class** SumofDigits {

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

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

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

**int** num = sc.nextInt(), sum = 0;

**while** (num > 0) {

            sum += num % 10;

            num /= 10;

        }

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

    }

}

Output:

Enter a number: 2407

Sum of digits: 13

**10. Print the given number pattern.**

**package** CondiPractice;

**import** java.util.\*;

**public** **class** SumofDigits {

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

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

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

**int** N = sc.nextInt();

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

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

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

            }

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

        }

  }

}

Output:

Enter the N value: 5

1

2 2

3 3 3

4 4 4 4

5 5 5 5 5

**Control Flow Statements:**

**Level 2:**

**Medium**

1. **Keeping in mind there are 86400 seconds per day, write a program that calculates how many seconds there are in a week if a week is 7 days.**

**import** java.util.\*;

**public** **class** Seconds {

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

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

**int** day=sc.nextInt();

System.***out***.println("Seconds for given number of days "+day\*86400);

sc.close();

}

}

1. **2. Mark is purchasing certain glossary items in a supermarket. While purchasing certain items, a discount of 15% is offered to him if the quantity purchased is more than 500. Help, Mark to calculate the total expenses.**

**import** java.util.\*;

**public** **class** Discount {

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

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

**double** amt=sc.nextDouble();

**if**(amt>500) {

System.***out***.println("You have a discount of 15% total expenxe is "+(amt-(amt\*0.15)));

sc.close();

}

}

}

Output:

540

You have a discount of 15% total expenxe is 459.0

1. **Write a program to calculate bill of a job work done as follows by using if-else statement. a. Rate of typing 3 Rs. per page b. Printing of 1s copy Rs. per page and later every copy 3 Rs. per page.**

**import** java.util.\*;

**public** **class** Page {

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

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

System.***out***.println("1-typing 2-copy");

**int** job=sc.nextInt();

System.***out***.println("Enter number of paper required");

**int** paper=sc.nextInt();

**if**(job==1) {

System.***out***.println("Rate of typing: "+paper\*3);

}

**else** {

**if**(paper==1) {

System.***out***.println("Rate of copying: 1");

}

**else** {

System.***out***.println("Rate of copying: "+(1+(paper-1)\*3));

}

}

sc.close();

}

}

Output:

1-typing 2-copy

1

Enter number of paper required

8

Rate of typing: 24

**4. Write a program to calculate bill for Internet browsing. The conditions are: a. 1 hr 50 Rs. b. 1min 1 Re. c. 5 hrs 200 Rs. d. User can only browse maximum 7 hrs**

**package** CondiPractice;

**import** java.util.\*;

**public** **class** InternetBrowsing {

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

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

        System.***out***.print("Enter browsing time in hours: ");

**int** hours = sc.nextInt();

        System.***out***.print("Enter additional minutes: ");

**int** minutes = sc.nextInt();

**if** (hours > 7 || (hours == 7 && minutes > 0)) {

            System.***out***.println("Maximum browsing limit is 7 hours.");

**return**;

        }

**int** totalBill = 0;

**if** (hours >= 5) {

            totalBill = 200;

            hours -= 5;

        }

        totalBill += hours \* 50 + minutes;

        System.***out***.println("Total Bill: Rs. " + totalBill);

    }

}

Output:

Enter browsing time in hours: 5

Enter additional minutes: 50

Total Bill: Rs. 250

1. **Write a program that reads continuously a month number (1 = Jan, 12 = Dec), the day that the month begins (1 = Mon, 7 = Sun), and displays the calendar for that month. If the selected month is February, the program should prompt the user to enter the month’s number of days, that is, 28 or 29. If the given month is out of [1, 12], the program should terminate**

**package** CondiPractice;

**import** java.util.\*;

**public** **class** Calender {

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

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

        System.***out***.println("Enter the month number");

**int** month=sc.nextInt();

        System.***out***.println("Enter the starting day of the month");

**int** start=sc.nextInt();

**int** noofdays;

**if** (month == 2) {

            System.***out***.print("Enter the number of days in February 28 or 29: ");

          noofdays= sc.nextInt();

        }

**else** {

**int**[] daysInMonths = { 0, 31, 0, 31, 30, 31, 30, 31, 31, 30, 31, 30, 31 };

            noofdays = daysInMonths[month];

        }

        String[] Days = { "Mon", "Tue", "Wed", "Thu", "Fri", "Sat", "Sun" };

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

**for** (String a : Days) {

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

        }

        System.***out***.println();

**int** c = 1;

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

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

        }

**for** (**int** i = start; c <= noofdays; i++) {

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

**if** (i % 7 == 0) {

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

            }

            c++;

        }

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

    }

}

Output:

Enter the month number

7

Enter the starting day of the month

2

 Calendar

Mon Tue Wed Thu Fri Sat Sun

1 2 3 4 5 6

7 8 9 10 11 12 13

14 15 16 17 18 19 20

21 22 23 24 25 26 27

28 29 30 31

**6. Calculate purchase amount to be paid after discount using if-else. Consider 10 % discount for the Sale amount above 1000 and 5% discount for the Sale amount less than 1000. Formula: Purchase Amount = price \* quantity Discount Amount = Purchase amount \* 0.10(10%) Paid Amount = Purchase Amount – Discount Amount**

**package** CondiPractice;

**import** java.util.\*;

**public** **class** PurchaseDiscount {

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

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

        System.***out***.print("Enter price per item: ");

**double** price = sc.nextDouble();

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

**int** quantity = sc.nextInt();

**double** purAmt = price \* quantity;

**double** discount = (purAmt > 1000) ? purAmt \* 0.10 : purAmt \* 0.05;

**double** finalAmt = purAmt - discount;

        System.***out***.println("Total Purchase Amount: Rs. " + purAmt);

        System.***out***.println("Discount Applied: Rs. " + discount);

        System.***out***.println("Final Amount to be Paid: Rs. " + finalAmt);

    }

}

Output:

Enter price per item: 500

Enter quantity: 5

Total Purchase Amount: Rs. 2500.0

Discount Applied: Rs. 250.0

Final Amount to be Paid: Rs. 2250.0

**7. To input basic salary of an employee and calculate gross salary based on the condition given below using if-else-if ststement: Basic Salary <= 10000 : HRA = 20%, DA = 80% Basic Salary is between 10001 to 20000: HRA = 25%, DA = 90% Basic Salary >= 20001 : HRA = 30%, DA = 95% Gross Salary=Basic Salary + HRA + DA**

**package** CondiPractice;

**import** java.util.\*;

**public** **class** EmpGross {

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

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

**int** sal=sc.nextInt();

**double** hra;

**double** da;

**if**(sal<=10000) {

hra=0.20\*sal;

da=0.80\*sal;

}

**else** **if**(sal>10001 && sal<20000) {

hra=0.25\*sal;

da=0.90\*sal;

}

**else** {

hra=0.30\*sal;

da=0.95\*sal;

}

**double** total=sal+hra+da;

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

sc.close();

}

}

Output:

10000

20000.0

**8. Accepts a string and calculate the number of digits and letters. Sample I/O: Enter String: India became independent in 1947 Output: Letters: 24, Digits: 4, Other Symbols: 4**

**package** CondiPractice;

**import** java.util.\*;

**public** **class** CountLetter {

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

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

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

String inp=sc.nextLine();

**int** letter=0;

**int** digit=0;

**int** other=0;

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

**char** ch=inp.charAt(i);

**if**(Character.*isLetter*(ch)) {

letter++;

}

**else** **if**(Character.*isDigit*(ch)) {

digit++;

}

**else** {

other++;

}

}

System.***out***.println("Letter: "+letter+" Digits: "+digit+" Others: "+other);

sc.close();

}

}

Output:

Enter the string:

Jeevika

Letter: 7 Digits: 0 Others: 0

**9. To check whether the given number is Armstrong number or not. Note: Armstrong number is 3 digit number, the sum of cubes of each digit is equal to the number itself.**

**package** CondiPractice;

**public** **class** Armstrong {

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

**int** n=9474;

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

**int** temp=n;

**int** two=0;

**while**(temp>0) {

**int** l=temp%10;

**int** one=1;

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

one\*=l;

}

two += one;

temp=temp/10;

}

**if**(n==two) {

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

}

**else** {

System.***out***.println("not an armstrong");

}

}

}

Output:

Armstrong

**Control Flow Statements:**

**Level 3:**

**Hard:**

1. **Numbers and Alphabets has equivalent ASCII values i.e Numbers (0 to 9) equivalent ASCII value is 48 to 57, uppercase alphabet (A to Z) equivalent ASCII value is 65 to 90 and lowercase alphabet (a to z) equivalent ASCII value is 97 to 120. Write a program to sort numbers 0 to 9, alphabets in upper and lowercase using equivalent ASCII values.**

**package** CondiPractice;

**import** java.util.\*;

**public** **class** Ascii {

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

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

        System.***out***.print("Enter alp or num");

        String input = sc.nextLine();

**char**[] arr = input.toCharArray();

        Arrays.*sort*(arr);

        System.***out***.println("Sorted Order using ASCII values:");

        System.***out***.println(**new** String(arr)+" ");

        sc.close();

    }

}

Output:

Enter a mix of numbers and alphabets: 1 2 3 f d a 1

Sorted Order using ASCII values:

       1 1 2 3 a d f

1. **The final grade of a student in a course is calculated as 30% of the exercise’s grade and as 70% of the exam’s grade, only if both grades are greater than or equal to 5; otherwise, the final grade will be their minimum. Write a program that reads continuously pairs of grades (exercises and exam grades) and displays the final grade for each student, until the user enters a pair of grades containing the value −1. Before it ends, the program should display the average grade of all students in the course. The program should check that all given grades belong in [0,10].**

package CondiPractice;

import java.util.\*;

public class Grade {

public static void main(String args[]) {

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

double totalGrade=0;

int count=0;

while(true) {

double excercise=sc.nextDouble();

double exam=sc.nextDouble();

if(excercise==-1 && exam==-1) {

break;

}

if(excercise<0 || excercise>10 || exam<0 || exam>10) {

System.*out*.println("enter between 0 to 10");

continue;

}

double total;

if(excercise >= 5 && exam >=5) {

total=excercise\*0.30 + exam\*0.70;

}

else {

total=Math.*min*(exam, excercise);

}

totalGrade += total;

count++;

System.*out*.println(total);

}

if(count > 0) {

double average=totalGrade/count;

System.*out*.println("Average of all the students"+average);

}

sc.close();

}

}

**Output:**

5

             4

4.0

1. **Ana planned to choose the four digit lucky number for her car. Her lucky numbers are 3, 5 and 7. Help her to find the number, whose sum is divisible by 3 or 5 or 7. Provide a valid car number, Fails to provide a valid input then display that number is not a valid car number. Sample Input 1: Enter the car no: 1234 Sample Output 1: Lucky Number Sample Input 2: Enter the car no: 1214 Sample Output 2: Sorry it’s not my lucky number Sample Input 3: Enter the car no: 14 Sample Output 3: 14 is not a valid car number**

package CondiPractice;

import java.util.\*;

public class LuckyNo {

public static void main(String args[]) {

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

System.*out*.println("Enter the car no: ");

int carNum=sc.nextInt();

int sum=0;

int c=1;

while(carNum>0) {

int a=carNum%10;

c++;

sum += a;

carNum=carNum/10;

}

if(c>4 && sum%3==0 || sum%5==0 || sum%7==0) {

System.*out*.println("Lucky Number");

}

else {

System.*out*.println("Sorry it's not my lucky number");

}

sc.close();

}

}

**Output:**

Enter the car no:

50

Lucky Number

**4. A cloth showroom has announced the following festival discounts on the purchase of items based on the total cost of the items purchased: Total Cost Less than Rs. 2000 Discount Rate Rs. 2000 to less than Rs. 5000 5% Rs. 5000 to less than Rs. 10,000 25% Rs. 10,000 and above 35% 50% Write a program to input the total cost and to compute and display the amount to be paid by the customer availing the discount. Sample Input 1: 4500 Sample Output 1: 3375.0 Sample Input 2: 6800 Sample Output 2: 4420.0**

package CondiPractice;

import java.util.\*;

public class ClothShowroom {

public static void main(String args[]) {

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

double total=sc.nextDouble();

double discount=0;

if(total<2000) {

discount=0;

}

else if(total >= 2000 && total < 5000) {

discount=0.05;

}

else if(total >= 5000 && total <10000) {

discount=0.25;

}

else if(total >= 10000){

discount=0.35;

}

double discountAmount=total\*discount;

double amountTotal=total-discountAmount;

System.*out*.println("amount to be paid: "+amountTotal);

sc.close();

}

}

**5.Sam teaches his student to find the factorial of a number. He wanted to test the understanding of the student. For that, he provides a number. He wants the students to tell him that number is a factorial of which number. Help the student by writing a program to do this. Note that the input should be a number greater than zero. If the input is less than or equal to zero, the output should be “Invalid Input”. Also, if the input provided is not exactly the factorial of a number, say, the input provided is 122, which is not a perfect factorial of a number; it should return “Sorry. The given number is not a perfect factorial”. Sample Input 1: 5040 Sample Output 1: 7 Sample Input 2: 0 Sample Output 2: Invalid Input Sample Input 3: 700 Sample Output 3: Sorry. The given number is not a perfect factorial**

**package** CondiPractice;

**import** java.util.Scanner;

**public** **class** Factorial {

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

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

**long** num=sc.nextLong();

**if**(num<=0) {

System.***out***.println("invalid input");

}

**else** {

**long** fact=1;

**int** i=1;

**boolean** isFact=**false**;

**while**(fact <= num) {

**if**(fact==num) {

isFact=**true**;

**break**;

}

i++;

fact \*=i;

}

**if**(isFact) {

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

}

}

sc.close();

}

}