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| **Experiment No.** | 02 |

| **AIM:** | Write a program to demonstrate constructor |
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| **Program 1** | |
| **PROBLEM STATEMENT :** | esign a Time class with data members hours, minutes and seconds. Add a no-argument  constructor to the class which initializes hours, minutes, and seconds to 0. Further add  two conversion() methods to the class. conversion1() method has the time in seconds as  a parameter and converts and displays the time into hours, minutes and seconds, apart  from initializing the time object. Write another method conversion2() which has 3  parameters, hours, minutes and seconds, which will compute and display the total seconds  of a Time object. Write another class called TestTime which contains the main() method.  Create 2 different objects of Time class in main(), first object should call conversion1()  method user to enter seconds as an integer in the argument. And second object should call  conversion2() with appropriate parameters.  For example, if user enters 4205 seconds as an input called totSeconds, the answer should  be:  Hours : 1  Minutes : 10  Seconds : 5  Similarly, vice-versa. Use Scanner for reading data through keyboard |
| **PROGRAM:** | class Time{  int hours,minutes,seconds;  Time(){  hours=0;  minutes=0;  seconds=0;  }    void conversion1(int sec){  hours = sec /3600;  sec = sec%3600;  minutes= sec/60;  seconds= sec%60;  System.out.println("Hours="+hours);  System.out.println("Minutes=" + minutes);  System.out.println("Seconds=" +seconds);  }    void conversion2(int hour, int min , int sec){  hours =hour;  minutes= min;  seconds = sec;  int totSec= hour\*3600 +min\*60+ sec;  System.out.println("Total time in seconds =" +totSec);    }  }  import java.util.\*;  class TestTime{  public static void main(String[] args) {  Scanner sc= new Scanner(System.in);  Time t1= new Time();  System.out.println("Enter the total seconds: ");  int totSec = sc.nextInt();  t1.conversion1(totSec);    Time t2= new Time();  System.out.println("Enter The hours ");  int hour = sc.nextInt();  System.out.println("Enter The minutes ");  int min = sc.nextInt();  System.out.println("Enter The seconds ");  int sec = sc.nextInt();  t2.conversion2( hour, min, sec);    sc.close();  }  } |
| **RESULT:** | |
| **Program 2** | |
| **PROBLEM STATEMENT :** | Create a class 'Employee' with three data members which are name, age and Salary. The  constructor of the class assigns default values name as "unknown", age as '18' and salary  as 20000. Write the setter and getter methods for class Employee. Write another method  which prints the name, age and Salary of an employee. Test the methods in a separate  class called TestEmployee which contains the main() method |
| **PROGRAM:** | class Employee{  String name;  int age;  int salary;    Employee(){  this.name="unknown";  this.age= 18;  this.salary = 20000;  }    void setName(String name){  this.name= name;  }    String getName(){  return name;  }    void setAge(int age){  this.age = age;  }    int getAge(){  return age;  }    void setSalary(int salary){  this.salary= salary;  }  int getSalary(){  return salary;  }    void printInfo(){  System.out.println("The Employee Details are: ");  System.out.println("Employee name: "+name);  System.out.println("Employee age: "+age+ " years");  System.out.println("Salary: $"+salary);  }  }  import java.util.\*;  class TestEmployee{  public static void main(String[] args) {  Employee e1= new Employee();  Scanner sc = new Scanner(System.in);    //print the default details  System.out.println("The default values are: ");  e1.printInfo();    System.out.print("Enter the name of Employee: ");  String name = sc.nextLine();  e1.setName(name);    System.out.print("Enter the age of Employee: ");  int age = sc.nextInt();  e1.setAge(age);    System.out.print("Enter the Salary of Employee:");  int salary = sc.nextInt();  e1.setSalary(salary);    // Print the updated details  System.out.println("\nUpdated details are:");  e1.printInfo();    sc.close();    }  } |
| **RESULT:** | |
| **Program 3** | |
| **PROBLEM STATEMENT:** |  |
| **PROGRAM:** | import java.util.Scanner;  class Fraction {  int num;  int den;  Fraction() {  num = 1;  den = 1;  }  Fraction(int a, int b) {  this.num = a;  this.den = b;  }  int gcd(int a, int b) {  if (b == 0)  return a;  else  return gcd(b, a % b);  }  void reduce() {  int divisor = gcd(num, den);  num /= divisor;  den /= divisor;  }  void print() {  System.out.print("" + num + "/" + den);  }  void addFraction(Fraction f1, Fraction f2) {  this.num = (f1.num \* f2.den) + (f1.den \* f2.num);  this.den = (f1.den \* f2.den);  reduce();  print();  }  void subFraction(Fraction f1, Fraction f2) {  this.num = (f1.num \* f2.den) - (f1.den \* f2.num);  this.den = (f1.den \* f2.den);  reduce();  print();  }  void mulFaction(Fraction f1, Fraction f2) {  this.num = (f1.num \* f2.num);  this.den = (f1.den \* f2.den);  reduce();  print();  }  void divFaction(Fraction f1, Fraction f2) {  this.num = (f1.num \* f2.den);  this.den = (f1.den \* f2.num);  reduce();  if (this.den == 0) {  System.out.println("Undefined!");  } else {  print();  }  }  void mulTable(int n) {  int i;  Fraction m = new Fraction();  System.out.print("\n\t");  for (i = 1; i <= n; i++) {  Fraction f1 = new Fraction(i, n);  f1.reduce();  f1.print();  System.out.print("\t");  }  System.out.println("\n");  for (i = 1; i <= n; i++) {  Fraction f1 = new Fraction(i, n);  f1.reduce();  f1.print();  System.out.print("\t");  for (int j = 1; j <= n; j++) {  Fraction f2 = new Fraction(j, n);  m.mulFaction(f1,f2);  System.out.print("\t");  }  System.out.print("\n\n");  }  }      public static void main(String[] args) {  Fraction f = new Fraction();  Scanner sc = new Scanner(System.in);  int option;  int a,b,c,d;  System.out.print("Enter the numerator of 1st fraction: ");  a = sc.nextInt();  do{  System.out.print("Enter the denominator of 1st fraction: ");  b = sc.nextInt();  if (b == 0) { //  System.out.println("Denominator of Fraction can't be zero. Enter valid Denominator");  }  else  break;    }while(true);    Fraction f1 = new Fraction(a, b);  System.out.print("Enter the numerator of 2nd fraction: ");  c = sc.nextInt();  do{  System.out.print("Enter the denominator of 2nd fraction: ");  d = sc.nextInt();  if (d == 0) { //  System.out.println("Denominator of Fraction can't be zero. Enter valid Denominator");  }  else  break;    }while(true);  Fraction f2 = new Fraction(c, d);  loop: while (true) {  System.out.println("\n\nMenu:\t1.Addition\t2.Subtraction\t3.Multiplication\t4.Division\t5.Exit");  System.out.print("Enter your choice: ");  option = sc.nextInt();  switch (option) {  case 1:  System.out.print("The resultant Addition of Fractions is:");  f.addFraction(f1, f2);  break;  case 2:  System.out.print("The resultant Subtraction of Fractions is:");  f.subFraction(f1, f2);  break;  case 3:  System.out.print("The resultant Multiplication of Fractions is:");  f.mulFaction(f1, f2);  break;  case 4:  System.out.print("The resultant Division of Fractions is:");  f.divFaction(f1, f2);  break;  case 5:  System.out.println("Exiting the calculator");  break loop;  default:  System.out.println("\nInvalid Option!");  break;  }  }  System.out.print("Enter the denominator for multiplication table: ");  int z = sc.nextInt();  if (z <= 0) {  System.out.println("Invalid input! Please enter a positive integer.");  } else {  f.mulTable(z);  }  sc.close();  }  } |
| **RESULT:** | |
| **CONCLUSION:** | In conclusion, Experiment No. 2 demonstrates encapsulation through the creation of Time and Employee classes. Additionally, a four-function calculator for fractions showcases versatile arithmetic operations with user-friendly input and output methods. |