G H Patel of College of Engineering & Technology

Department of Computer Engineering

Vision

To produce globally competitive computer engineers, who are prepared to accept the challenges at professional level, while maintaining the core values.

Mission

- ✓ To create excellent teaching learning environment.
- ✓ To mould engineers with a strong foundation of scientific knowledge and engineering concepts.
- ✓ To enhance the acquired concepts and develop new technology through excellence in research.
- ✓ To assist nation building and elevating the quality of life of the people through leadership in professionalism, education, research, and public services.

Programme Educational Objectives (PEO)

- ✓ To educate young aspirants with the fundamentals of engineering and knowledge of latest technologies.
- ✓ To encourage the students to remain updated by pursuing higher degree or certification programs.
- ✓ To assume management and leadership roles to contribute in socio-economic development of the nation.

G.H. Patel of College of Engineering and Technology

Department of Computer Engineering

A.Y_____, SEMESTER __

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NAME: _____

ENROLMENT NO: _____BRANCH: _____

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1	**Basic Program** 1. Study of class path and java runtime environment 2. Write a program to ● Implement command line calculator Write To prints Fibonacci series.				

2	**Array:**
	1. Define a class Array with following member
	Field:
	int data[];
	Function:
	Array( ) //create array data of size 10
	Array(int size) // create array of size size
	Array(int data[]) // initialize array with parameter array
	void Reverse _an _array () //reverse element of an array
	int Maximum _of _array () // find maximum element of array
	int Average_of _array() //find average of element of array
	void Sorting () //sort element of array
	void display() //display element of array
	int search(int no) //search element and return index else return -1
	int size(); //return size of an array				

Use all the function in main method. Create different objects with different constructors.

2. Define a class Matrix with following
Field:

int row, column;

float mat[][]

Function:

Matrix(int a[][])

Matrix()

Matrix(int rwo, int col)

void readMatrix() //read element of array

float [][] transpose( ) //find transpose of first matrix

float [][] matrixMultiplication(Matrix second) //multiply two matrices and return result

void displayMatrix(float [][]a) //display content of argument array

void displayMatrix() //display content

float maximum_of_array() // return maximum element of first array

float average_of_array( ) // return average of first array

create three object of Matrix class with different constructors in main and test all the functions in main

3. Write a program to demonstrate usage of different methods of Wrapper class
4. Write a program to demonstrate usage of String and StringBuffer class
5. Define a class Cipher with following data
   Field:

   String plainText;

   int key

   Functions:

   Cipher(String plaintext,int key)

   String Encryption( )

String Decryption( )

Read string and key from command prompt and replace every character of string with character which is key place down from current character.

Example

plainText = “GCET”

Key = 3

Encryption function written following String

“ JFHW”

Decryption function will convert encrypted string to original form “GCET”

3 **Basic Program using Class**

1. Create a class BankAccount that has Depositor name , Acc_no, Acc_type, Balance as Data Members and void createAcc() . void Deposit(), void withdraw() and void BalanceInquiry as Member Function. When a new Account is created assign next serial no as account number. Account number starts from 1

2. Create a class time that has hour, minute and second as data members. Create a parameterized constructor to initialize Time Objects. Create a member Function Time Sum (Time, Time) to sum two time objects.
3. Define a class with the Name, Basic salary and dearness allowance as data members.Calculate and print the Name, Basic salary(yearly), dearness allowance and tax deduced at source(TDS) and net salary, where TDS is charged on gross salary which is basic salary + dearness allowance and TDS rate is as per following table.

Gross Salary	TDS
Rs. 100000 and below	NIL
Above Rs. 100000	10% on excess over 100000

DA is 74% of Basic Salary for all. Use appropriate member function.

4 **Inheritance and interface**

1. class Cricket having data members name, age and member methods display() and setdata(). class Match inherits Cricket and has data members no_of_odi, no_of_test. Create an array of 5 objects of class Match. Provide all the required data through command line and display the information.
2. Define a class Cripher with following data
   Field:

   String plainText;

   int key

Functions:

Cipher(String plaintext,int key)

abstract String Encryption( )

abstract String Decryption( )

Derived two classes Substitution_Cipher and Caesar_Cipher override Encyption() and Decyption() Method. in substitute cipher every character of string is replace with another character. For example. In this method you will replace the letters using the following scheme.

Plain Text: a b c d e f g h i j k l m n o p q r s t u v w x y z

Cipher Text: q a z w s x e d c r f v t g b y h n u j m i k o l p

So if string consist of letter "gcet" then encrypted string will be "ezsj" and decrypt it to get original string

In ceaser cipher encrypt the string same as program 5 of LAB 5.

3. Declare an interface called Property containing a method computePrice to compute and return the price. The interface is to be implemented by following two classes i) Bungalow and ii) Flat. Both the classes have following data members

   - name
   - constructionArea

   The class Bungalow has an additional data member called landArea. Define computePrice for both classes for computing total price. Use following rules for computing total price by summing up sub-costs:

   Construction cost(for both classes):Rs.500/- per sq.feet

   Additional cost (for Flat) : Rs. 200000/-

   (for Bungalow): Rs. 200/- per sq.

   feet for landArea

   Land cost (only for Bungalow): Rs. 400/- per sq. feet

   Define method main to show usage of method computePrice.

4. Define following classes and interfaces.

```
public interface GeometricShape {

    public void describe();
```

```
}
public interface TwoDShape extends GeometricShape {
   public double area();
}
public interface ThreeDShape extends GeometricShape {
   public double volume();
}
public class Cone implements ThreeDShape  {
   private double radius;
   private double height;
   public Cone (double radius, double height)
   public double volume()
   public void describe()
}
public class Rectangle implements TwoDShape  {
   private double width, height;
   public Rectangle (double width, double height)
   public double area()
   public double perimeter()
   public void describe()


}
public class Sphere implements ThreeDShape  {
   private double radius;
   public Sphere (double radius)
   public double volume()
   public void describe()
}
```

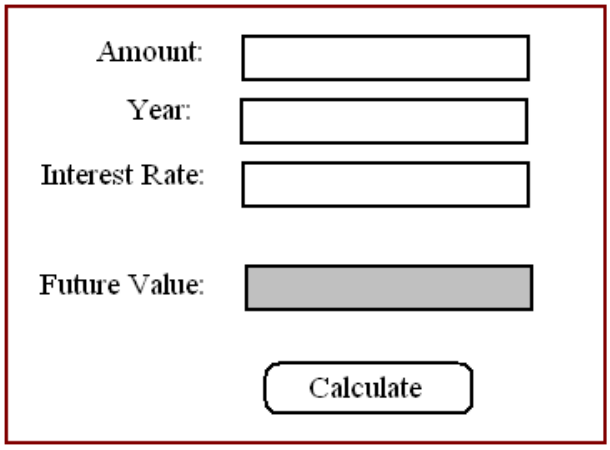
Define test class to call various methods of Geometric Shape

5	**Inner Class:** Define two nested classes: Processor and RAM inside the outer class: CPU with following data members				

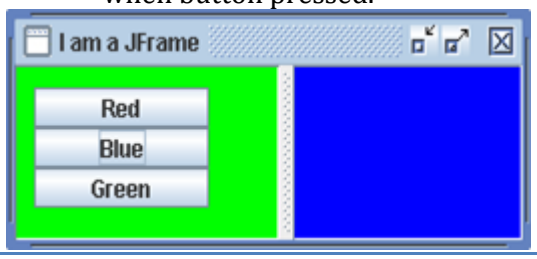
	class CPU {
	double price;
	class Processor{ // nested class
	double cores;
	double catch()
	String manufacturer;
	double getCache()
	void displayProcesorDetail()
	}
	protected class RAM{ // nested protected class
	// members of protected nested class
	double memory;
	String manufacturer;
	Double clockSpeed;
	double getClockSpeed()
	void displayRAMDetail()
	}
	}
	1. Write appropriate Constructor and create instance of Outer and inner class and call the methods in main function
	Write a program to demonstrate usage of static inner class, local inner class and anonymous inner class				

6	**Generics**
	1. Declare a class InvoiceDetail which accepts a type parameter which is of type Number with following data members
	class InvoiceDetail <N extends Number> {
	private String invoiceName;
	private N amount;
	private N Discount
	// write getters, setters and constructors
	}
	Call the methods in Main class
	2. Implement Generic Stack
	3. Write a program to sort the object of Book class using comparable				

	and comparator interface. (Book class consist of book id, title, author and publisher as data members)				
7	**Exception Handing** 1. Write a program for creating a **Bank** class, which is used to manage the bank account of customers. Class has two methods, Deposit () and withdraw (). Deposit method display old balance and new balance after depositing the specified amount. Withdrew method display old balance and new balance after withdrawing. If balance is not enough to withdraw the money, it throws **ArithmeticException** and if balance is less than 500rs after withdrawing then it throw custom exception, **NotEnoughMoneyException**. 2. Write a complete program for calculation average of n +ve integer numbers of Array A. a. Read the array form keyboard b. Raise and handle Exception if i. Element value is -ve or non-integer. If n is zero.				
8	**Threading** 1. Write a program to find prime number in given range using both method of multithreading. Also run the same program using executor framework 2. Assume one class Queue that defines queue of fix size says 15. ● Assume one class producer which implements Runnable, having priority NORM_PRIORITY +1 ● One more class consumer implements Runnable, having priority NORM_PRIORITY-1 ● Class TestThread is having main method with maximum priority, which creates 1 thread for producer and 2 threads for consumer. ● Producer produces number of elements and put on the queue. when queue becomes full it notifies other threads. Consumer consumes number of elements and notifies other thread when queue become empty.				
9	**Collection API:** 1. Write a program to demostrate user of ArrayList, LinkedList ,LinkedHashMap, TreeMap and HashSet Class. And also implement CRUD operation without database connection using Collection API. Write a program to Sort Array,ArrayList,String,List,Map and Set				
10	**File Handling Using Java:** 1. Write a programme to count occurrence of a given words in a file. 2. Write a program to print it seltf. Write a program to display list of all the files of given directory				
11	**Networking** 1. Implement Echo client/server program using TCP Write a program using UDP which give name of the audio file to server and server reply with content of audio file				
12	**GUI** 1. Write a programme to implement an investement value calculator using the data inputed by user. textFields to be included are amount, year, interest rate and future value. The field “future value” (shown in gray) must not be altered by user.				



2. Write a program which fill the rectangle with the selected color when button pressed.



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