SOMAIYA
VIDYAVIHAR UNIVERSITY
K J Somaiya College of Engineering

Somaiya
T R U S T

Batch: D2   **Roll No.:** 16010122323

Experiment / assignment / tutorial No. 04

Grade: AA / AB / BB / BC / CC / CD /DD

Signature of the Staff In-charge with date

TITLE: An Array of Objects

AIM: Write a program which accepts information about n no of customers from user. Create an array of objects to store account_id ,name,balance.

Your program should provide following functionalities

1.   To add account
2.   To delete any account detail
3.   To display account details.

Expected OUTCOME of Experiment:

CO1: Understand the features of object oriented programming compared with procedural

approach with C++ and Java

CO2: Explore arrays, vectors, classes and objects in C++ and Java.

Books/ Journals/ Websites referred:

1.   Ralph Bravaco , Shai Simoson , "Java Programing From the Group Up"   Tata McGraw-Hill.
2.   Grady Booch, Object Oriented Analysis and Design .

Pre Lab/ Prior Concepts:

Arrays of Objects:

Unlike traditional array which store values like string, integer, boolean, etc. array of objects stores objects. The array elements store the location of reference variables of the object.

For example:

```
class Student {
   int rno;
   String name;
   float avg;
}
Student(int r, String name, float average)
{
    rno=r;
   this.name=name;
    avg=average;
}


Student studentArray[] = new Student[n];
```
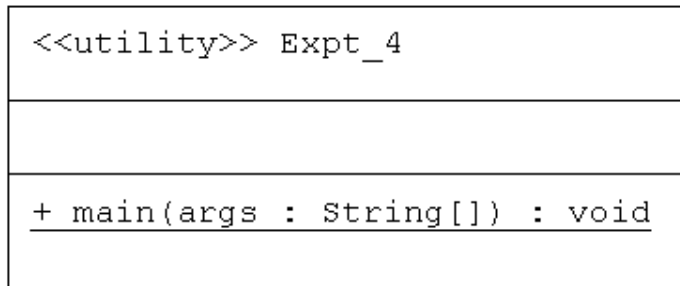
● The above statement creates the array which can hold references to n number of Student objects. It doesn't create the Student objects themselves. They have to be created separately using the constructor of the Student class. The studentArray contains n number of memory spaces in which the address of n Student objects may be stored.

```
for ( int i=0; i<studentArray.length; i++) {
studentArray[i]=new Student(r,name,average);
}
```

● The above for loop creates n Student objects and assigns their reference to the array elements. Now, a statement like the following would be valid.
studentArray[i].r=1001;
.

Class Diagram:

```
┌─────────────────────────────────────┐
│ <<utility>> Expt_4                  │
├─────────────────────────────────────┤
│                                     │
├─────────────────────────────────────┤
│ + main(args : String[]) : void      │
│                                     │
└─────────────────────────────────────┘
```

Algorithm:

1. Create a class Account with attributes int is, String name and float Balance.
2. Create a constructor for this class.
3. Create a public class Expt_4.
4. Define the main method in this class.
5. Create an object of Scanner class.
6. Get the total number of customers from the user and declare the array of same length.
7. Define a while loop.
8. In this while loop get choice from the user to Add, Delete, Display the account or to Exit.
9. If user selects option 1.
10. Get the number of accounts to be added initially.
11. Get account number, account holder name and balance.
12. Store this in the array of objects defines earlier.
13. If user selects option 2.
14. Get the account number from the user.
15. Find that account number in the array and shift the next element of the array at that position.
16. If user selects option 3.
17. Print the contents of array using for loop.
18. If user selects option 4.
19. Exit

Implementation details:

```java
import java.util.Scanner;

class Account{

    int id;

    String name;

    float bal;

    Account(int id,String name,float bal){

        this.id = id;

        this.name = name;

        this.bal = bal;

    }

}

public class Expt_4 {

    public static void main(String[] args) {

        Scanner sc = new Scanner(System.in);

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

        int c = sc.nextInt();

        int n = 0; //Number of accounts is initially zero

        int op;
```

```java
while (true){

    System.out.printf("Enter your choice \n1.Add Account\n2.Delete
Account\n3.Display Account\n4.Exit\n");

    op= sc.nextInt();

    Account[] ac = new Account[c];

    switch (op){

        case 1:{

            System.out.println("Enter number of Accounts you want to enter : ");

            n = sc.nextInt();

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

                System.out.println("Enter Account Number:");

                int ano = sc.nextInt();

                System.out.println("Enter Account Holder Name:");

                String ana = sc.next();

                System.out.println("Enter Balance:");

                float aba = sc.nextFloat();

                ac[i] = new Account(ano,ana,aba);

            }

            System.out.println("Accounts added successfully !");
```

```
        break;

   }

case 2:{

   if (n==0)

      System.out.println("No Accounts to be deleted !");

   else {

      System.out.println("Enter Account Number to be deleted:");

      int dac = sc.nextInt();

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

      {

         if(dac==ac[i].id)

         {

            for(int j =i;j<(n-1);j++)

            {

               ac[j]= ac[j+1];

            }

            n--;

            System.out.println("Account Deleted");

         }
```

```java
        }

    }

    break;

}

case 3:{

    System.out.println("Account number\nAccount Holder Name\n Balance");

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

    {

        System.out.println(ac[i].id+"\n"+ac[i].name+"\n"+ac[i].bal);

    }

    break;

}

case 4:{

    System.out.println("Thank you for using our Service !");

    System.exit(0);

    break;

}

default:

    System.out.println("Enter a valid choice !");
```

```
            }

        }

    }

}
```

Output:

```
Enter total number of customers :
10
Enter your choice
1.Add Account
2.Delete Account
3.Display Account
4.Exit
1
Enter number of Accounts you want to enter :
2
Enter Account Number:
1452364751
Enter Account Holder Name:
A
Enter Balance:
2000
Enter Account Number:
1234556780
Enter Account Holder Name:
B
Enter Balance:
30000.25
Accounts added successfully !
Enter your choice
1.Add Account
2.Delete Account
3.Display Account
4.Exit
```

Conclusion:

The aim of the experiment is verified.

Date: _____   **Signature of faculty in-charge**

Post Lab Descriptive Questions

Q.1 If an array of objects is of size 10 and a data value have to be retrieved from 5th object then _____ syntax should be used.

a)Array_Name[4].data_variable_name;
b)Data_Type Array_Name[4].data_variable_name;
c)Array_Name[4].data_variable_name.value;
d) Array_Name[4].data_variable_name(value);
Ans: A

 Q.2)The Object array is created in _____
a)Heap memory
b) Stack memory
c) HDD
d) ROM

Ans : A