Course Name:	**Object Oriented Programming Methodology**	**Semester:**	**III**
Date of Performance:	**25/08/2023**	**Batch No:**	**B-2**
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Faculty Sign & Date:		**Grade/Marks:**	**___/25**

Experiment No: 4

Title: Array of objects

Aim and Objective of the Experiment:

Write a program which accepts information about **n** no of customers from the 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.

COs to be achieved:

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.

Tools used:

JDK, VScode / Eclipse

Theory:

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:

Class name	Exp4
Variables	-
Functions	main()

→

Class name	acccount
Variables	Int id, String name, double balance
Functions	-

Algorithm:

1. Create a class Account with attributes int is, String name andfloat 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 declarethe 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 elementof 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

```java
import java.util.Scanner;

public class CricketPlayerStatistics {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        System.out.print("Enter the number of players in the match: ");
        int n = scanner.nextInt();

        int[][] playerInfo = new int[n][];
        double[] battingAvg = new double[n];

        for (int i = 0; i < n; i++) {
            System.out.print("Enter the number of matches played by Player " + (i + 1) + ": ");
            int playedMatches = scanner.nextInt();
            playerInfo[i] = new int[playedMatches];
            int totalScore = 0;

            for (int j = 0; j < playedMatches; j++) {
                System.out.print("Please enter the number of runs scored by Player " + (i + 1) + " in match " + (j + 1) + ": ");

                playerInfo[i][j] = scanner.nextInt();
                totalScore += playerInfo[i][j];
            }

            battingAvg[i] = (double) totalScore / playedMatches;
        }
```

```
        int bestAvgPlayerIndex = 0;
        double bestAvg = battingAvg[0];

        for (int i = 1; i < n; i++) {
            if (battingAvg[i] > bestAvg) {
                bestAvg = battingAvg[i];
                bestAvgPlayerIndex = i;
            }
        }

        System.out.println("\nPlayer Information:");
        for (int i = 0; i < n; i++) {
            System.out.println("Player " + (i + 1) + ":");
            System.out.print("Runs scored: ");

            for (int runs : playerInfo[i]) {
                System.out.print(runs + " ");
            }

            System.out.println("\nBatting Average: " + String.format("%.2f", battingAvg[i]) + "\n");
        }

        System.out.println("Player with the best batting average: Player " + (bestAvgPlayerIndex + 1) + " with an average of "
    + String.format("%.2f", bestAvg));

        scanner.close();
    }
```

Output:

```
Enter the number of customers: 4
Enter initial balance for customer 1: 100
Enter initial balance for customer 2: 200
Enter initial balance for customer 3: 300
Enter initial balance for customer 4: 400

Options:
1. Deposit
2. Withdraw
3. Display Accounts
4. Exit
Enter your choice: 1
Enter account ID to deposit: 1
Enter the deposit amount: 200
Deposit of $200.0 successful. New balance: $300.0

Options:
1. Deposit
2. Withdraw
3. Display Accounts
4. Exit
Enter your choice: 2
Enter account ID to withdraw: 3
Enter the withdrawal amount: 100
Withdrawal of $100.0 successful. New balance: $200.0

Options:
1. Deposit
2. Withdraw
3. Display Accounts
4. Exit
Enter your choice: 3
Account Information:
Account ID: 1
Balance: $300.0
------------
Account ID: 2
Balance: $200.0
------------
Account ID: 3
Balance: $200.0
------------
Account ID: 4
Balance: $400.0
------------

Options:
1. Deposit
2. Withdraw
3. Display Accounts
4. Exit
```

Post Lab Subjective/Objective type Questions:

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

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

ANS- A

Conclusion:

We have successfully implemented and completed the experiment . we have learnt how to use classes , objects and constructors successfully.

Signature of faculty in-charge with Date: