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EXPERIMENT – 04

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CLASS AND GROUP – CSE9A

SEMESTER - 01

TOPIC OF EXPERIMENT – Programs of Experiment 3 based on Arrays, I/O Functions, Conditional Statements and Data Types.

AIM OF THE EXPERIMENT – To understand Arrays, I/O functions, various datatypes and Conditional Statements in C programming language by making 5 programs.

PRACTICAL 4.1

A salesman has n things to sale. The cost price of all n things is different out of which p things he is selling on m% profit and n-p things he is going to sell on x% loss. Find his net profit or loss.

PROGRAM CODE 4.1

```c
#include <stdio.h>

int main()

{

    int n, p, i;

    printf("Enter total amount of things that are to be sold = ");
    scanf("%d", &n);
    printf("\n");

    float item[n];

    printf("Enter the cost of each product: \n");
```

```
    for (int i = 0; i < n; i++)
    {
        printf("Enter amount of item number %d = ", i + 1);
        scanf("%f", &item[i - 1]);
    }

    float m, x, profit = 0, loss = 0, total;

    printf("\nEnter number of profiable items = ");
    scanf("%d", &p);

    printf("Enter the percentage of profit = ");
    scanf("%f", &m);

    printf("Items for loss are = %d", n - p);

    printf("\nEnter the percentage of loss in remaining item : ");
    scanf("%f", &x);

    for (i = 0; i < p; i++)
    {
        profit += (m * item[i]) / 100;
    }

    for (i = p; i < n; i++)
    {
        loss += (x * item[i]) / 100;
    }

    total = profit - loss;

    printf("\n----------------------------------------\n");

    if (total > 0)
        printf("Salesman gets Rs. %.2f profit", total);

    else if (total < 0)
        printf("Salesman gets Rs. %.2f loss", total * -1);

    else

        printf("Salesman got neither profit nor loss");

    return 0;
}
```

OUTPUT 4.1

```
Enter total amount of things that are to be sold = 5

Enter the cost of each product:
Enter amount of item number 1 = 10
Enter amount of item number 2 = 20
Enter amount of item number 3 = 30
Enter amount of item number 4 = 40
Enter amount of item number 5 = 50

Enter number of profiable items = 3
Enter the percentage of profit = 5
Items for loss are = 2
Enter the percentage of loss in remaining item : 4

----------------------------------------
Salesman gets Rs. 2.50 profit
```

Brief Explanation:

This program takes input of the number of items to be sold and stores their costs in an array. The programs ask the number of items that are profitable and the percentage of profit. On the bases of this information, it states whether the salesman have gained a profit or suffered a loss

Program was made using Arrays, Standard I/O Commands, different data types and if-else statements.

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PRACTICAL 4.2

Find m greatest 6-digit and n smallest 7-digit numbers which are divisible by number p. Print these numbers on the screen.

PROGRAM CODE 4.2

```c
#include <stdio.h>

int main()
{
    int p;
    printf("Enter number to check divisibility with = ");
    scanf("%d", &p);
    long i = 999999;
    while (i % p != 0)
    {
        i--;
    }
    printf("\nLargest 6 digit integer is %ld", i);

    long j = 1000000;
    while (j % p != 0)
    {
        j++;
    }
    printf("\nSmallest 7 digit integer divisible by %d is %ld", p, j);

    return 0;
}
```

OUTPUT 4.2

```
Enter number to check divisibility with = 6

Largest 6 digit integer is 999996
Smallest 7 digit integer divisible by 6 is 1000002
```

Brief Explanation:

This program takes input of a number and finds a 6 digit and a 7 digit number that are divisible by the entered number.

PRACTICAL 4.3

There are n customers of bank who took loan of different amounts (Entered by User) and for different time periods but same rate of interest. The interest is compounded annually find the total interest earned by bank from all n customers.

PROGRAM CODE 4.3

```c
#include <stdio.h>
#include <stdlib.h>
#include <math.h>

int main()
{
    int n, i;

    printf("Enter number of customers = ");
    scanf("%d", &n);

    float principal[n], time[n], r, intr = 0;

    printf("Annual Interest Rate = ");
    scanf("%f", &r);

    printf("\nData of Customers:\n");

    for (i = 0; i < n; i++)
    {
        printf("\nCustomer number %d\n", i + 1);

        printf("Principal amount = ");
        scanf("%f", &principal[i]);

        printf("Time period = ");
        scanf("%f", &time[i]);
    }

    for (i = 0; i < n; i++)
    {
        intr += principal[i] * (pow((1 + (r / (100))), time[i]) - 1);
    }

    printf("\n\nEanrings of bank from the customers interests is = Rs.%0.2f", intr);
    return 0;
}
```

OUTPUT 4.3

```
Enter number of customers = 5
Annual Interest Rate = 4

Data of Customers:

Customer number 1
Principal amount = 10000
Time period = 3

Customer number 2
Principal amount = 10000
Time period = 3

Customer number 3
Principal amount = 15000
Time period = 4

Customer number 4
Principal amount = 18000
Time period = 5

Customer number 5
Principal amount = 20000
Time period = 5


Eanrings of bank from the customers interests is = Rs.13277.95
```

Brief Explanation:

This program takes input of number of customers of a banks and asks for the interest rate that the bank owns. Each customer must fill his/her Principal amount and time period. The program then finds out the total amount that the bank earned from its customers

PRACTICAL 4.4

On reaching the railway station, you find that the train you wanted to catch is just to start and there is hardly any time for purchasing the ticket. The same situation faced by many people in our country.

You have to do data analysis task for which you will record responses from N people and then print your report accordingly. User enter option a for “Rush to train to catch it and inform T.T at next stop, b for” Catch the train and perform journey without ticket”, c for “purchase the ticket first otherwise wait for next train”, and d for “Miss the train and take ticket for next train “.On the basis of responses print in your report about the habit of our countrymen.

If responses of any two options are equal then print it in either or form. If more than two responses are equal or having difference <=1 then print no conclusion drawn.

PROGRAM CODE 4.4

```c
#include <stdio.h>

int main()

{
    int n, i = 0, max = 0, counter = 0, l[2], m = 0;
    int frequency[4] = {0, 0, 0, 0};

    printf("Hello Sir/Ma'am\nThis survey is regarding the common issue we all face,\nMany
a times we get late reaching the railway station\nAnd face a dilemma deciding whether to g
et ticket first or rush to train\nSo, below given are some options please fill most prefer
able");
    char a = 'a', ch, ar[][60] = {"Rush to train to catch it and inform T.T at next stop",
 "Catch the train and perform journey without ticket", "Purchase ticket first otherwise wa
it for next train", "Miss the train and take ticket for next train"};

    printf("\n\nEnter the no of people to take survey from = ");
    scanf("%d", &n);

    for (i = 0; i < 4; i++)
    {
        printf("%c. %s\n", a, ar[i]);
        a++;
    }

    i = 0;

    do
    {
        printf("\nEnter your choice (a/b/c/d) = ");
```

```
        scanf("\n%c", &ch);

        if (ch == 'a')
        {
            frequency[0]++;
        }

        else if (ch == 'b')
        {
            frequency[1]++;
        }

        else if (ch == 'c')
        {
            frequency[2]++;
        }

        else if (ch == 'd')
        {
            frequency[3]++;
        }

        else
        {
            printf("\nInvalid choice\n");
        }

        i++;

    } while (i < n);

    printf("\nFrequencies of option a,b,c,d are:");

    for (i = 0; i < 4; i++)
    {
        printf("%d ", frequency[i], ch);
    }

    for (i = 0; i < 4; i++)
    {

        if (max < frequency[i])
        {
            max = frequency[i];
        }
    }

    for (i = 0; i < 4; i++)
    {
        if (frequency[i] % max < 1 && frequency[i] != 0)
        {
            ++counter;
```

```
        }
    }

    if (counter == 1)
    {
        for (i = 0; i < 4; i++)
        {
            if (max == frequency[i])
            {
                printf("\n\nMost of the people will %s", ar[i]);
            }
        }
    }

    else if (counter == 2)
    {
        for (i = 0; i < 4; i++)
        {
            if (max == frequency[i])
            {
                l[m] = i;
                m++;
            }
        }

        printf("\nPeople will either %s or %s", ar[l[0]], ar[l[1]]);
    }

    else
    {
        printf("\nNo conclusion");
    }

    return 0;
}
```

OUTPUT 4.4

```
Hello Sir/Ma'am
This survey is regarding the common issue we all face,
Many a times we get late reaching the railway station
And face a dilemma deciding whether to get ticket first or rush to train
So, below given are some options please fill most preferable

Enter the no of people to take survey from = 5
a. Rush to train to catch it and inform T.T at next stop
b. Catch the train and perform journey without ticket
c. Purchase ticket first otherwise wait for next train
d. Miss the train and take ticket for next train

Enter your choice (a/b/c/d) = a

Enter your choice (a/b/c/d) = b

Enter your choice (a/b/c/d) = c

Enter your choice (a/b/c/d) = d

Enter your choice (a/b/c/d) = a

Frequencies of option a,b,c,d are:2 1 1 1

Most of the people will Rush to train to catch it and inform T.T at next stop
```

Brief Explanation:

This program gives 4 choices to the entered number of survey people. Each person selects his/her choice. The program then shows the most frequently opted choice

PRACTICAL 4.5

You are given task to write numbers from m to n, during this task how many times do you write digit d. e.g. if m=10 and n=25 and d=1 you write from 10 to 20 on screen and count how many times you write 1. In this case count for d=1 is 11 as from 10 to 19 you write 1, 11 times and once in 21 so total count is 12?

PROGRAM CODE 4.5

```c
#include <stdio.h>

int main()

{
    int m, n, d, i, temp, count = 0;

    printf("Enter Initial number = ");
    scanf("%d", &m);

    printf("Enter Ending number = ");
    scanf("%d", &n);

    printf("Enter digit you want to count : ");
    scanf("%d", &d);

    for (i = m; i <= n; i++)
    {
        temp = i;
        while (temp)
        {
            if (d == (temp % 10))
                count++;
            temp /= 10;
        }
    }

    printf("In the given series, repetition of %d is : %d times", d, count);
    return 0;
}
```

OUTPUT 4.5

```
Enter Initial number = 100
Enter Ending number = 200
Enter digit you want to count : 5
In the given series, repetition of 5 is : 20 times
```

Brief Explanation:

This program takes input an initial number and a final number. It also asks to check a digit that is to be checked that how many times the digit gets repeated in the entered range.

LEARNING OUTCOMES

- Identify situations where computational methods would be useful.
- Approach the programming tasks using techniques learnt and write pseudo-code.
- Choose the right data representation formats based on the requirements of the problem.
- Use the comparisons and limitations of the various programming constructs and choose the right one for the task.

EVALUATION COLUMN (To be filled by concerned faculty only)

Sr. No.	Parameters	Maximum Marks	Marks Obtained
1.	Worksheet Completion including writing learning objective/ Outcome	10	
2.	Post Lab Quiz Result	5	
3.	Student engagement in Simulation/ Performance/ Pre-Lab Questions	5	
4.	Total Marks	20	