

ASSIGNMENT – 3

NAME: SANJAI VIJAYAKUMAR

REGISTER NO: 21BRS1021

SLOT: L31+L32+L49+L50

DATE: 13.02.2022

The textile showroom manager has prepared the half yearly sales budget with the following details. Each row corresponds to a particular item like Men's Wear, Silk Sarees, Kids Wear etc. There are at most 5 items to be budgeted. Each column of the array corresponds to a month, January, February, etc. All the sale records are stored in the array. Write a Program to

- A. Find the sales of each month and the deviation from the average sales of six months.
- B. Find out which month had the maximum sales in the half yearly budget.

CODE:

```
#include <stdio.h>
#include <stdlib.h>
int main()
{
    float montly_avg;
    int option,temp1,max_month,max = 0,total_sales = 0;
    char temp;
    printf("\nEnter Number Of items: "); scanf("%d", &option);
    if (option <= 5)
    {
        char items[option][100];
        int sales[6][option];
        for (int i = 0; i < option; i++)
        {
            printf("\nEnter Item Name: "); scanf("%s", &items[i][i]);
        }
        for (int i = 0; i < 6; i++)
        {
            printf("\nMonth-%d", i + 1);

            for (int j = 0; j < option; j++)
            {
                printf("\n%s Sales: ",items[j]);
                scanf("%d", &sales[i][j]);
            }
        }
        for (int i = 0; i < 6; i++)
        {
            printf("\nMonth-%d", i + 1);
            int total = 0;
            for (int j = 0; j < option; j++)
            {
                total += sales[i][j];
            }
            if (total > max)
            {
                max = total;
                max_month = i + 1;
            }
        }
        printf("\n\nThe Month with maximum sales is %d",max_month);
        printf("\n\nThe maximum sales is %d",max);
    }
}
```

```

        {
            max = total;
            max_month = i;
        }
        printf("\nTotal Sales:%d", (total));
        total_sales += total;
    }
    float total_sales_avg = (total_sales / 6);

    for (int i = 0; i < 6; i++)
    {
        float total1 = 0;
        for (int j = 0; j < option; j++)
        {
            total1 += sales[i][j];
        }
        float month_average = total1 / option;
        printf("\nMonth-%d Average Sales: %.2f", i + 1, month_average);
        if (total1 > month_average)
        {
            printf("\nDeviation from 6 months: %.2f", total1 - month_average);
        }
        else
        {
            printf("\nDeviation from 6 months: %.2f", month_average - total1);
        }
    }
    printf("\nMax Sales for %d : %d", max_month, max);
}

```

OUTPUT:

```

~/Users/vijayakumarmuthusamy/COLLEGE/PROGRAMMING/github/C_PROBLEMS_VIT
↳ cd "/Users/vijayakumarmuthusamy/COLLEGE/PROGRAMMING/github/C_PROBLEMS_VIT/" && gcc C_Lab_1.c -o C_Lab_1 && "/Users/vijayakumarmuthusamy/COLLEGE/PROGRAMMING/github/C_PROBLEMS_VIT/"C_Lab_1

Enter Number Of items: 2

Enter Item Name: TV

Enter Item Name: PHONE

Month-1
TV Sales: 10

Sales: 10

Month-2
TV Sales: 20

Sales: 20

Month-3
TV Sales: 30

Sales: 30

Month-4
TV Sales: 40

Sales: 40

Month-5
TV Sales: 50

Sales: 50

Month-6
TV Sales: 60

Sales: 60

```

```
Month-1
Total Sales:20
Month-2
Total Sales:40
Month-3
Total Sales:60
Month-4
Total Sales:80
Month-5
Total Sales:100
Month-6
Total Sales:120
Month-1 Average Sales: 10.00
Deviation from 6 months: 10.00
Month-2 Average Sales: 20.00
Deviation from 6 months: 20.00
Month-3 Average Sales: 30.00
Deviation from 6 months: 30.00
Month-4 Average Sales: 40.00
Deviation from 6 months: 40.00
Month-5 Average Sales: 50.00
Deviation from 6 months: 50.00
Month-6 Average Sales: 60.00
Deviation from 6 months: 60.00
Max Sales for 5 : 120%
```

Develop a C program that will determine whether a department-store customer has exceeded the credit limit on a charge account.

Input the following customer details.

- a) Account number
- b) Balance at the beginning of the month
- c) Total of all items charged by this customer this month
- d) Total of all credits applied to this customer's account this month
- e) Allowed credit limit

Pass the beginning balance, charges and credits to the function, the function should calculate the new balance, return the new balance to the main program. Determine whether the new balance exceeds the customer credit limit. If it exceeded print the message "Credit limit exceeded."

CODE:

```
#include <stdio.h>
int credit_score(int,int,int);
int main()
{
    int acc_no,balance,charges,total_credit,credit_limit;
    printf("\nEnter Account number:");
    scanf("%d",&acc_no);
    printf("\nEnter balance at beginning of the month:");
    scanf("%d",&balance);
    printf("\nEnter total of all items charged by the customer this month:");
    scanf("%d",&charges);
    printf("\nEnter total of all credits applied to the customer this month:");
    scanf("%d",&total_credit);
    printf("\nEnter allowed credit limit:");
    scanf("%d",&credit_limit);
    int res;
    res = credit_score(balance,charges,total_credit);
    if (res>credit_limit) printf("\nCredit limit exceeded.");
    else printf("\nCredit limit not exceeded.");
}
int credit_score(int x,int y,int z)
{
    int a;
    a = x + y - z;
    return a;
}
```

OUTPUT:

```
~/Users/vijayakumarmuthusamy/COLLEGE/PROGRAMMING/github/C_PROBLEMS_VIT
↳ cd "/Users/vijayakumarmuthusamy/COLLEGE/PROGRAMMING/github/C_PROBLEMS_VIT/" && gcc problem2.c -o problem2 && "/Users/vijayakumarmuthusamy/COLLEGE/PROGRAMMING/github/C_PROBLEMS_VIT/"problem2

Enter Account number:1234

Enter balance at beginning of the month:1000

Enter total of all items charged by the customer this month:500

Enter total of all credits applied to the customer this month:200

Enter allowed credit limit:1200
Your new balance:1300
Credit limit exceeded.%
```

Given an identity $a^2-b^2 = (a+b) * (a-b)$, write a ‘C’ program for computing a^2-b^2 (given ‘a’ & ‘b’) using call by value. Further your code should also check whether the computed value of a^2-b^2 using the function is same as the one computed directly using the values of ‘a’ & ‘b’.

CODE:

```
#include <stdio.h>
#include <math.h>
int func(int,int);
int main()
{
    int a,b,final,func_final;
    printf("Enter a:"); scanf("%d",&a);
    printf("Enter b:"); scanf("%d",&b);
    final = (a+b)*(a-b);
    func_final = func(a,b);
    printf("Value of a^2-b^2:%d",func_final);
    printf("\nValue of (a+b)*(a-b):%d",final);printf("\n");
    if (final==func_final) printf("a^2-b^2 is equal to (a+b)*(a-b).Verified");
    else printf("Not verified");
}
int func(int x,int y)
{
    int res;
    res = pow(x,2)-pow(y,2);
    return res;
}
```

OUTPUT:

```
/Users/vijayakumarmuthusamy/COLLEGE/PROGRAMMING/github/C_PROBLEMS_VIT
↳ cd "/Users/vijayakumarmuthusamy/COLLEGE/PROGRAMMING/github/C_PROBLEMS_VIT/" && gcc problem3.c -o problem3 && "/Users/vijayakumarmuthusamy/COLLEGE/PROGRAMMING/github/C_PROBLEMS_VIT/"problem3
Enter a:20
Enter b:300
Value of a^2-b^2:-89600
Value of (a+b)*(a-b):-89600
a^2-b^2 is equal to (a+b)*(a-b).Verified
/Users/vijayakumarmuthusamy/COLLEGE/PROGRAMMING/github/C_PROBLEMS_VIT
↳ cd "/Users/vijayakumarmuthusamy/COLLEGE/PROGRAMMING/github/C_PROBLEMS_VIT/" && gcc problem3.c -o problem3 && "/Users/vijayakumarmuthusamy/COLLEGE/PROGRAMMING/github/C_PROBLEMS_VIT/"problem3
Enter a:15
Enter b:14
Value of a^2-b^2:29
Value of (a+b)*(a-b):29
a^2-b^2 is equal to (a+b)*(a-b).Verified
```

Given an identity $a^2-b^2 = (a+b) * (a-b)$, write a ‘C’ program for computing a^2-b^2 (given ‘a’ & ‘b’) using call by reference. Further your code should also check whether the computed value of a^2-b^2 using the function is same as the one computed directly using the values of ‘a’ & ‘b’.

CODE:

```
#include <stdio.h>
#include <math.h>
int func(int *x,int *y);
int main()
{
    int a,b,final,func_final;
    printf("Enter a:"); scanf("%d",&a);
    printf("Enter b:"); scanf("%d",&b);
    final = (a+b)*(a-b);
    func_final = func(&a,&b);
    printf("Value of a^2-b^2:%d",func_final);
    printf("\nValue of (a+b)*(a-b):%d",final);printf("\n");
    if (final==func_final) printf("a^2-b^2 is equal to (a+b)*(a-b).Verified");
    else printf("Not verified");
}
int func(int *x,int *y)
{
    int res;
    res = pow(*x,2)-pow(*y,2);
    return res;
}
```

OUTPUT:

```
~/Users/vijayakumarmuthusamy/COLLEGE/PROGRAMMING/github/C_PROBLEMS_VIT
└─ cd "/Users/vijayakumarmuthusamy/COLLEGE/PROGRAMMING/github/C_PROBLEMS_VIT/" && gcc problem4.c -o problem4 && "/Users/vijayakumarmuthusamy/COLLEGE/PROGRAMMING/github/C_PROBLEMS_VIT/"problem4
Enter a:20
Enter b:13
Value of a^2-b^2:231
Value of (a+b)*(a-b):231
a^2-b^2 is equal to (a+b)*(a-b).Verified
~/Users/vijayakumarmuthusamy/COLLEGE/PROGRAMMING/github/C_PROBLEMS_VIT
└─ cd "/Users/vijayakumarmuthusamy/COLLEGE/PROGRAMMING/github/C_PROBLEMS_VIT/" && gcc problem4.c -o problem4 && "/Users/vijayakumarmuthusamy/COLLEGE/PROGRAMMING/github/C_PROBLEMS_VIT/"problem4
Enter a:12
Enter b:11
Value of a^2-b^2:23
Value of (a+b)*(a-b):23
a^2-b^2 is equal to (a+b)*(a-b).Verified
```

'wc' is a unix utility that display the count of characters, words and lines present in the given sentence. The sentence should read from the standard input. Write a program to simulate the 'wc' command.

CODE:

```
#include <stdio.h>
#include <string.h>
void word_count(char x[200]);
void line_count(char x[200]);
void character_count(char x[200]);
int main()
{
    char input[200];
    printf("Enter content(press ~ and hit enter...):");
    scanf("%[^~]s",input);
    word_count(input);
    printf("\n");
    line_count(input);
    printf("\n");
    character_count(input);
    return 0;
}
void word_count(char x[200])
{
    int i=0,wc=1;
    while (x[i]!='\0')
    {
        if ((x[i]==' ') || (x[i]=='\n') || (x[i]=='\t')) wc++;
        i++;
    }
    printf("Total number of words in the given content:%d",wc);
}
void line_count(char x[200])
{
    int i=0,lc=1;
    while (x[i]!='\0')
    {
        if (x[i]=='\n') lc++;
        i++;
    }
}
```

```

        printf("Total number of lines in the given content:%d",lc);
    }
void character_count(char x[200])
{
    int i=0;
    int char_count,digit_count,space_count,spl_count;
    char_count=digit_count=space_count=spl_count=0;
    while (x[i]!='\0')
    {
        if ((x[i]>='0') && (x[i]<='9')) digit_count++;
        else if ((x[i]>='a')&&(x[i]<='z')) char_count++;
        else if (x[i]==' ') space_count++;
        else spl_count++;
        i++;
    }
    printf("Total number of characters with spaces:%d",char_count+spl_count+space_count+digit_count);
    printf("\nTotal number of characters without spaces:%d",char_count+spl_count+digit_count);
}

```

OUTPUT:

```

~/Users/vijayakumarmuthusamy/COLLEGE/PROGRAMMING/github/C_PROBLEMS_VIT
↳ cd ~/Users/vijayakumarmuthusamy/COLLEGE/PROGRAMMING/github/C_PROBLEMS_VIT/" && gcc problem5.c -o problem5 && "/Users/vijayakumarmuthusamy/COLLEGE/PROGRAMMING/github/C_PROBLEMS_VIT/"problem5
Enter content(press ~ and hit enter..):Sanjaii is a student in VIT.
He is studying Btech CSE with AI and Robotics and is currently in his first year.~
Total number of words in the given content:22
Total number of lines in the given content:2
Total number of characters in the given content with spaces:110
Total number of characters in the given content without spaces:90

```

Given three words, write a C program to identify the following letters:

- a. Letters common to all the three words
- b. Letters in first two words but not in third word
- c. Letters in first word but not in second and third word
- d. Letters in all the three words.

CODE:

```
#include <stdio.h>
void func1(char c[500],char d[500],char e[500]);
void func2(char c[500],char d[500],char e[500]);
void func3(char c[500],char d[500],char e[500]);
void func4(char c[500],char d[500],char e[500]);
int main()
{
    char a[500],b[500],c[500];
    printf("Enter a:"); scanf("%s",a);
    printf("Enter b:"); scanf("%s",b);
    printf("Enter c:"); scanf("%s",c);
    func1(a,b,c);
    func2(a,b,c);
    func3(a,b,c);
    func4(a,b,c);
}
void func1(char c[500],char d[500],char e[500])
{
    int x[123]={0},y[123]={0},z[123]={0};
    for (int i=0;c[i]!='\0';i++) x[c[i]]++;
    for (int i=0;d[i]!='\0';i++) y[d[i]]++;
    for (int i=0;e[i]!='\0';i++) z[e[i]]++;
    for (int i=0;i<123;i++)
    {
        if (x[i]!=0 && y[i]!=0 && z[i]!=0)
        {
            int arr1[200],j=0;
            printf("\nLetters common to all three words:%c ",i);
        }
    }
}
void func2(char c[500],char d[500],char e[500])
{
    int x[123]={0},y[123]={0},z[123]={0};
    for (int i=0:c[i]!='\0':i++) x[c[i]]++;
```

```

        for (int i=0;d[i]!='\0';i++) y[d[i]]++;
        for (int i=0;e[i]!='\0';i++) z[e[i]]++;
        for (int i=0;i<123;i++)
        {
            if (x[i]!=0 && y[i]!=0 && z[i]==0)
            {
                printf("\nLetters in first two words but not in third word:%c ",i);
            }
        }

    }
void func3(char c[500],char d[500],char e[500])
{
    int x[123]={0},y[123]={0},z[123]={0};
    for (int i=0;c[i]!='\0';i++) x[c[i]]++;
    for (int i=0;d[i]!='\0';i++) y[d[i]]++;
    for (int i=0;e[i]!='\0';i++) z[e[i]]++;
    for (int i=0;i<123;i++)
    {
        if (x[i]!=0 && y[i]==0 && z[i]==0)
        {
            printf("\nLetters in first word but not in second and third:%c ",i);
        }
    }
}

void func4(char c[500],char d[500],char e[500])
{
    int x[123]={0},y[123]={0},z[123]={0};
    for (int i=0;c[i]!='\0';i++) x[c[i]]++;
    for (int i=0;d[i]!='\0';i++) y[d[i]]++;
    for (int i=0;e[i]!='\0';i++) z[e[i]]++;
    for (int i=0;i<123;i++)
    {
        if (x[i]!=0 || y[i]!=0 || z[i]!=0)
        {
            printf("\nLetters in all three words:%c",i);
        }
    }
}

```

OUTPUT:

```
/Users/vijayakumarmuthusamy/COLLEGE/PROGRAMMING/github/C_PROBLEMS_VIT
↳ cd "/Users/vijayakumarmuthusamy/COLLEGE/PROGRAMMING/github/C_PROBLEMS_VIT/" && gcc problem6.c -o problem6 && "/Users/vijayakumarmuthusam
y/COLLEGE/PROGRAMMING/github/C_PROBLEMS_VIT/"problem6
Enter a:apple
Enter b:camel
Enter c:element

Letters common to all three words:e
Letters common to all three words:l
Letters in first two words but not in third word:a
Letters in first word but not in second and third:p
Letters in all three words:a
Letters in all three words:c
Letters in all three words:e
Letters in all three words:l
Letters in all three words:m
Letters in all three words:n
Letters in all three words:p
Letters in all three words:t
```