Programming Fundamentals Lab
Lab Assignment 06

Course Code: CL1002

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Question 1

q1.c

```c
#include<stdio.h>
main(){
    int size, v=0,c=0,i; char alpha[size],vowels[10],consonants[10];

    printf("Number of Elements you want to enter: ");
    scanf("%d",&size);
    for(i=0;i<size;i++)
    {
        fflush(stdin);
        scanf("%c",&alpha[i]);
    }

    for(i=0;i<size;i++)
    {
        if(alpha[i] =='a' || alpha[i] =='e' || alpha[i] =='i' || alpha[i] =='o' || alpha[i] =='u'){
        vowels[v]=alpha[i];
        v++;    }
        else{
        consonants[c]=alpha[i];
        c++;}
    }
// FINAL OUTPUTS
    printf("Consonants are:\n");
    for(i=0;i<c;i++)
    {
        printf("%c\n",consonants[i]);
    }
    printf("Vowels are:\n");
    for(i=0;i<v;i++)
    {
        printf("%c\n",vowels[i]);
    }
    printf("Number of consonants are %d\n",c);
    printf("Number of vowels are %d\n",v);
}
```

```
C:\Users\Admin\Desktop\PF Lab\PF LAB 8\q1.exe
Number of Elements you want to enter: 5
q
w
e
t
o
Consonants are:
q
w
t
Vowels are:
e
o
Number of consonants are 3
Number of vowels are 2
```

Question: 2

q2.c | q1.c | q9.c

```c
#include<stdio.h>
#include<string.h>
main(){
    char name[30]; int length,i;
    printf("Enter name: ");
    scanf("%s",&name);
    length=strlen(name);

    printf("\nAfter reversing: ");
    for(i=length;i>=0;i--){
        printf("%c",name[i]);
    }

}
```

```
C:\Users\Admin\Desktop\q2.exe
Enter name: Shuja

After reversing:  ajuhS
--------------------------------
Process exited after 6.195 seconds with return value 83
Press any key to continue . . .
```

Question 3:

q3.c | [*] q1.c | q9.c | q5.c

```c
#include<stdio.h>
main(){
int i,j,M,N,a=0, A[M], B[N],P=M+N, C[P];

    //Getting user input for Array A
    printf("Enter size of A: ");
    scanf("%d",&M);

    printf("Before sorting elements of A:\n");
    for(i=0;i<M;i++){
        scanf("%d",&A[i]);
    }
    //Getting user input for Array B
    printf("Enter size of B:");
    scanf("%d",&N);

    printf("Before sorting elements of B:\n");
    for(i=0;i<N;i++){
        scanf("%d",&B[i]);
    }
    //Sorting of A in ascending order
    // a is temporary variable
    for(i=0;i<M;i++){
        for(j=i+1;j<M;j++){
            if(A[i]>A[j])//1 2
            a=A[i]; A[i]=A[j]; A[j]=a; }
    }
```

q3.c [*] q1.c q9.c q5.c

```c
    // Sorting of B in asecnding order
    // a is temporary variable
    for(i=0;i<N;i++){
        for(j=i+1;j<N;j++){
            if(B[i]>=B[j])
            a=B[i]; B[i]=B[j]; B[j]=a; }
    }
    //Output after sorting Array A and B
    printf("Elements of A after sorting:\n");
    for(i=0;i<M;i++){
        printf("%2d\t",A[i]);
    }
    printf("\n\nElements of B after sorting:\n");
    for(i=0;i<N;i++){
        printf("%2d\t",B[i]);
    }

    //Merging Array A and B
    for(i=0;i<M;i++)
        C[i]=A[i];
    for(i=0,j=M;j<P && i<N;i++,j++)
        C[j]=B[i];

    printf("\nC after merging A and B:\n");
    for(i=0;i<P;i++)
        printf("%2d\t",C[i]);

    //Sorting C in ascending order
    for(i=0;i<P;i++){
        for(j=i+1;j<P;j++){
        if(C[i]>C[j]){
        a=C[i] ; C[i]=C[j]; C[j]=a; }
        }
    }
    //FINAL OUTPUT
    printf("\nElements of After sorting in ascending order:\n");
        for(i=0;i<P;i++)
        printf("%2d\t",C[i]);
}
```

C:\Users\Admin\Desktop\PF Lab\PF LAB 8\q3.exe

```
Enter size of A: 3
Before sorting elements of A:
9
8
7
Enter size of B:3
Before sorting elements of B:
3
2
1
Elements of A after sorting:
 7       8       9

Elements of B after sorting:
 1       2       3
C after merging A and B:
 7       8       9       1       2       3
Elements of After sorting in ascending order:
 1       2       3       7       8       9
--------------------------------
Process exited after 6.971 seconds with return value 6
Press any key to continue . . .
```

Question: 4

q4.c

```c
#include<stdio.h>
main(){
    int i,Number[50];

    //initializing array
    for(i=0;i<50;i++){
        if(i<25)
            Number[i]=i*2;
        else
            Number[i]=i*3;
    }

    //final output
    for(i=0;i<50;i++){
        printf("%d\t",Number[i]);
        if( (i+1) % 10 == 0 )
        printf("\n");
    }
}
```

```
C:\Users\Admin\Desktop\PF Lab\PF LAB 8\q4.exe
0       2       4       6       8       10      12      14      16      18
20      22      24      26      28      30      32      34      36      38
40      42      44      46      48      75      78      81      84      87
90      93      96      99      102     105     108     111     114     117
120     123     126     129     132     135     138     141     144     147

--------------------------------
Process exited after 0.0616 seconds with return value 10
Press any key to continue
```

Question: 5

q5.c

```c
#include<stdio.h>
main(){
int stdntID[15],i=0,j,k,correct=0,wrong; char ans[10];
char corr[10]={'T','T','F','F','T','T','F','F','T','T'};
        //Getting user input
        while(i<15){
        printf("Student ID: ");
    fflush(stdin);
        scanf("%d",&stdntID[i]);
    // Getting student answers
        for(j=0;j<10;j++){
            printf("Enter answer to Q%d: ",j+1);
        fflush(stdin);
            scanf("%c",&ans[j]);
            if (ans[j]==corr[j])
            correct++;
            else
            continue;
        }
        //Printing of Results
        printf("\nStudent ID: %d obtained following result\n",stdntID[i]);
float   perc=(correct/10.0)*100;

        //Displaying Correct answers of the test
        printf("\nCorrect anSwers:");
        for(j=0;j<10;j++){
        printf("%c\t",corr[j]);}

        //Displying answers of the student
        printf("\n\nStudent answers:");
        for(j=0;j<10;j++){
        printf("%c\t",ans[j]);
        }
        //Printing of marks secured
        printf("\n\nMarks obtained: %d/10",correct);

        //Percentage obtained
        printf("\nPercentage obtained: %0.2f%%\n",perc);

        //Grading of the test
        if(perc>=90 && perc<=100)
        printf( "Grade: A");
        else if (perc>=80 && perc<90)
        printf( "Grade: B");
        else if (perc>=70 && perc<80)
        printf( "Grade: C");
        else if (perc>=60 && perc<70)
        printf( "Grade: D");
        else
        printf( "Grade: F");
        correct=0;
    i++;printf("\n\n");
    }
    }
```

OUTPUT ON NEXT PAGE

```
Student ID: 5656
Enter answer to Q1: T
Enter answer to Q2: F
Enter answer to Q3: T
Enter answer to Q4: F
Enter answer to Q5: T
Enter answer to Q6: T
Enter answer to Q7: F
Enter answer to Q8: F
Enter answer to Q9: T
Enter answer to Q10: T

Student ID: 5656 obtained following result

Correct anSwers:T       T       F       F       T       T       F       F       T       T

Student answers:T       F       T       F       T       T       F       F       T       T

Marks obtained: 8/10
Percentage obtained: 80.00%
Grade: B

Student ID: 6565
Enter answer to Q1: F
Enter answer to Q2: F
Enter answer to Q3: T
Enter answer to Q4: T
Enter answer to Q5: T
Enter answer to Q6: T
Enter answer to Q7: T
Enter answer to Q8: T
Enter answer to Q9: T
Enter answer to Q10: T

Student ID: 6565 obtained following result

Correct anSwers:T       T       F       F       T       T       F       F       T       T

Student answers:F       F       T       T       T       T       T       T       T       T

Marks obtained: 4/10
Percentage obtained: 40.00%
Grade: F

Student ID:
```

Question: 7

q7.c [*] q1.c [*] q9.c

```c
#include<stdio.h>
main(){
const int months=12;
int temp[months][2], i, j, x, sumlow=0, sumhigh=0, max, min;
float avglow=0, avghigh=0;

//Getting user input
    for(i=0;i<12;i++){
    printf("Enter HIGHEST temperature of the %d month: ",i+1);
        scanf("%d",&temp[i][0]);

    printf("Enter LOWEST temperature of the %d month: ",i+1);
        scanf("%d",&temp[i][1]);

    }
    max=temp[0][0];
    min=temp[0][1];

    for(i=0;i<months;i++){
        sumlow+=temp[i][1];
    //Checking Lowest temperature of the year.
        if (temp[i][1]<min)
        min=temp[i][1];
    }
    for(i=0;i<months;i++){
        sumhigh+=temp[i][0];
    //Checking Highest temperature of the year.
        if (temp[i][0]>max)
        max=temp[i][0];
    }
    //Calculating Averages
    avghigh=sumhigh/12.0;
    avglow=sumlow/12.0;


    printf("\nAverage of low tempertaures: %0.2f\n",avglow);
    printf("Average of high tempertaures: %0.2f\n",avghigh);

    printf("Lowest tempertaure of the year is: %d\n",min);
    printf("Highest tempertaure of the year is: %d\n",max);
}
```

C:\Users\Admin\Desktop\PF Lab\PF LAB 8\q7.exe

```
Enter HIGHEST temperature of the 1 month: 20
Enter LOWEST temperature of the 1 month: 10
Enter HIGHEST temperature of the 2 month: 32
Enter LOWEST temperature of the 2 month: 12
Enter HIGHEST temperature of the 3 month: 35
Enter LOWEST temperature of the 3 month: 15
Enter HIGHEST temperature of the 4 month: 40
Enter LOWEST temperature of the 4 month: 10
Enter HIGHEST temperature of the 5 month: 30
Enter LOWEST temperature of the 5 month: 15
Enter HIGHEST temperature of the 6 month: 55
Enter LOWEST temperature of the 6 month: 20
Enter HIGHEST temperature of the 7 month: 44
Enter LOWEST temperature of the 7 month: 22
Enter HIGHEST temperature of the 8 month: 33
Enter LOWEST temperature of the 8 month: 11
Enter HIGHEST temperature of the 9 month: 21
Enter LOWEST temperature of the 9 month: -1
Enter HIGHEST temperature of the 10 month: 5
Enter LOWEST temperature of the 10 month: -15
Enter HIGHEST temperature of the 11 month: 57
Enter LOWEST temperature of the 11 month: 20
Enter HIGHEST temperature of the 12 month: 32
Enter LOWEST temperature of the 12 month: 10

Average of low tempertaures: 10.75
Average of high tempertaures: 33.67
Lowest tempertaure of the year is: -15
Highest tempertaure of the year is: 57
```

Question: 8

q8.c | q1.c | q9.c

```c
#include<stdio.h>
main(){
    int a=1, i=1, j=1, rows=0;char choice;
    printf("Which option would you like:\n1.Numbers\n2.Asteriks(*)\n3.Alphabets\n");
    scanf("%c",&choice);
    printf("enter number of rows: ");
    scanf("%d",&rows);
    if(choice=='1'){ //number pattern
        for (i=1;i<=rows;i++){
            for(j=1;j<=i;j++){
            printf("%d",j);
        }
            printf("\n");
        }
    }
    else if(choice=='2'){ //Asteriks pattern
        for(i=1;i<=rows;i++)
            {
            for(j=1;j<=i;j++){
                printf("*");
                }
            printf("\n");
        }
    }
    else if(choice=='3'){ //alphabet pattern
        for(i=1;i<=rows;i++)
            {
            for(j=1,a=1;j<=i;j++){
                printf("%c",a+64);
                a++;}
                printf("\n");}
            }
}
```

C:\Users\Admin\Desktop\PF Lab\PF LAB 8\q8.exe

```
Which option would you like:
1.Numbers
2.Asteriks(*)
3.Alphabets
1
enter number of rows: 4
1
12
123
1234

--------------------------------
Process exited after 14.84 seconds wi
```

C:\Users\Admin\Desktop\PF Lab\PF LAB 8\q8.exe

```
Which option would you like:
1.Numbers
2.Asteriks(*)
3.Alphabets
3
enter number of rows: 5
A
AB
ABC
ABCD
ABCDE

--------------------------------
Process exited after 4.31 seconds with
```

C:\Users\Admin\Desktop\PF Lab\PF LAB 8\q8.exe

```
Which option would you like:
1.Numbers
2.Asteriks(*)
3.Alphabets
2
enter number of rows: 6
*
**
***
****
*****
******

--------------------------------
Process exited after 2.866 seconds wi
```

Question: 9

[*] q9.c | q5.c | [*] q1.c

```c
#include<stdio.h>
main(){
    int matrixA[3][3],matrixB[3][3],matrixC[3][3];
    int matrixD[3][3],matrixE[3][3],response,i,j,choice;

printf("How many matrices You want to work with:\n1. 2 matrices\n2. 3 matrices\n3. 4 Matrices\n");
scanf("%d",&response);
 switch (response){
    // 2 matrices
    case 1:
    printf("Matrix A\n");
    for(i=0;i<3;i++){
        for(j=0;j<3;j++){
        printf("element of A%d%d: ",i+1,j+1);
        scanf("%d",&matrixA[i][j]);
        }
    }
    printf("Matrix B\n");
    for(i=0;i<3;i++){
        for(j=0;j<3;j++){
        printf("element of B%d%d: ",i+1,j+1);
        scanf("%d",&matrixB[i][j]);
        }
    }break;

    // 3 Matrices
    case 2:
    printf("Matrix A\n");
    for(i=0;i<3;i++){
        for(j=0;j<3;j++){
        printf("element of A%d%d: ",i+1,j+1);
        scanf("%d",&matrixA[i][j]);
        }
    }
    printf("Matrix B\n");
    for(i=0;i<3;i++){
        for(j=0;j<3;j++){
        printf("element of B%d%d: ",i+1,j+1);
        scanf("%d",&matrixB[i][j]);
        }
    }
    printf("Matrix C\n");
    for(i=0;i<3;i++){
        for(j=0;j<3;j++){
        printf("element of C%d%d: ",i+1,j+1);
        scanf("%d",&matrixC[i][j]);
        }
    }break;
```

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[*] q9.c | q5.c | [*] q1.c

```c
    // 4 matrices
    case 3:
        printf("Matrix A\n");
    for(i=0;i<3;i++){
        for(j=0;j<3;j++){
        printf("element of A%d%d: ",i+1,j+1);
        scanf("%d",&matrixA[i][j]);
        }
    }
    printf("Matrix B\n");
    for(i=0;i<3;i++){
        for(j=0;j<3;j++){
        printf("element of B%d%d: ",i+1,j+1);
        scanf("%d",&matrixB[i][j]);
        }
    }
    printf("Matrix C\n");
    for(i=0;i<3;i++){
        for(j=0;j<3;j++){
        printf("element of C%d%d: ",i+1,j+1);
        scanf("%d",&matrixC[i][j]);
        }
    }
    printf("Matrix D\n");
    for(i=0;i<3;i++){
        for(j=0;j<3;j++){
        printf("element of D%d%d: ",i+1,j+1);
        scanf("%d",&matrixD[i][j]);
        }
    }
    break;
    default: printf("Invalid Input.");
}
    //OPERRATION TO CHOOSE
    printf("Which operation you wish to do?\n1.Addition\n2.Subtraction\n");
    fflush(stdin);
    scanf("%d",&choice);

    switch(choice){
    case 1:
    printf("Result Matrix:\n");
    //Following IF conditions are for the number of matrices the user have chosen.
        if(response==1){
        for(i=0;i<3;i++){
        for(j=0;j<3;j++){
        matrixE[i][j]=matrixA[i][j]+matrixB[i][j];
        }
    }}
        else if(response==2){
        for(i=0;i<3;i++){
        for(j=0;j<3;j++){
        matrixE[i][j]=matrixA[i][j]+matrixB[i][j]+matrixC[i][j];
        }
    }}
        else if(response==3){
        for(i=0;i<3;i++){
        for(j=0;j<3;j++){
        matrixE[i][j]=matrixA[i][j]+matrixB[i][j]+matrixC[i][j]+matrixD[i][j];
        }
    }}
```

CONTINUED ON NEXT PAGE

```c
110
111         break;
112         case 2:
113         printf("Result Matrix:\n");
114         //Following IF conditions are for the number of matrices the user have chosen.
115             if(response==1){
116             for(i=0;i<3;i++){
117             for(j=0;j<3;j++){
118             matrixE[i][j]=matrixA[i][j]-matrixB[i][j];
119             }
120         }}
121             else if(response==2){
122             for(i=0;i<3;i++){
123             for(j=0;j<3;j++){
124             matrixE[i][j]=matrixA[i][j]-matrixB[i][j]-matrixC[i][j];
125             }
126         }}
127             else if(response==3){
128             for(i=0;i<3;i++){
129             for(j=0;j<3;j++){
130             matrixE[i][j]=matrixA[i][j]-matrixB[i][j]-matrixC[i][j]-matrixD[i][j];
131             }
132         }}
133         break;
134         default: printf("Invalid Choice.\n");
135     }
136     //Output of resultant matrix.
137         for(i=0;i<3;i++){
138             for(j=0;j<3;j++){
139             printf("%d\t",matrixE[i][j]);
140         }printf("\n");
141         }
142     }
```

```
Which operation you wish to do?
1.Addition
2.Subtraction
2
Result Matrix:
-4      -4      -4
-4      -4      -4
-4      -4      -4

--------------------------------
Process exited after 25.22 seconds with return value 10
Press any key to continue . . .
```

C:\Users\Admin\Downloads\q9.exe

```
How many matrices You want to work with:
1. 2 matrices
2. 3 matrices
3. 4 Matrices: 3
Matrix A
element of A11: 1
element of A12: 1
element of A13: 1
element of A21: 1
element of A22: 1
element of A23: 1
element of A31: 1
element of A32: 1
element of A33: 1
Matrix B
element of B11: 1
element of B12: 1
element of B13: 1
element of B21: 1
element of B22: 1
element of B23: 1
element of B31: 1
element of B32: 1
element of B33: 1
Matrix C
element of C11: 2
element of C12: 2
element of C13: 2
element of C21: 2
element of C22: 2
element of C23: 2
element of C31: 2
element of C32: 2
element of C33: 2
Matrix D
element of D11: 2
element of D12: 2
element of D13: 2
element of D21: 2
element of D22: 2
element of D23: 2
element of D31: 2
element of D32: 2
element of D33: 2
```