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PF Lab Assignment

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Task 01:

Create an array named alpha that is of char data type. User can input random characters into this array. Create a program that tells the user how many vowels and consonants has the user emtered. Also create two new arrays named vowels and consonant and store the vowels in vowels array, store the consonant in consonant array.

Program & Output

```c
#include<stdio.h>
int main()
{
    printf("Enter No. of Alphabets: ");
    int num,sumvovel=0,sumcon=0;
    scanf("%d",&num);
    char ch[num];
    char vovel[sumvovel];
    char con[sumcon];
    printf("Enter Alphabets: \n");
    for(int j=0;j<num;j++)
    {
        scanf("\n%c",&ch[j]);
    }
    for (int i=0;i<num;i++)
    {
        if ((ch[i]=='a')||(ch[i]=='e')||(ch[i]=='i')||(ch[i]=='o')||(ch[i]=='u'))
        {
            sumvovel=sumvovel+1;
            vovel[i]=ch[i];
                for(int t=0;t<1;t++)
                {
                    printf("\nVovels Are: %c",vovel[i]);
                }
        }
        else
        {
            sumcon=sumcon+1;
            con[i]=ch[i];
                for(int k=0;k<1;k++)
                   {
                       printf("\nConsunant Are: %c",con[i]);
                   }
        }
    }
    printf("\nYou Entered %d Vovel",sumvovel);
    printf("\nYou Enbtered %d Consunant",sumcon);
}
```

```
Enter No. of Alphabets: 5
Enter Alphabets:
ghjio

Consunant Are: g
Consunant Are: h
Consunant Are: j
Vovels Are: i
Vovels Are: o
You Entered 2 Vovel
You Enbtered 3 Consunant
--------------------------------
```

Task 02:

Write a program that takes a word from user and display it in reverse order.
Sample Output:
Enter name: Ali
Output: ilA

Program & Output

```c
#include<stdio.h>
int main()
{
    char ch[20];
    printf("Enter Word: ");
    scanf("%s",ch);
    printf("You entered:%s",ch);
    int d;
    d=strlen(ch);
    printf("\nReversed Word is:");
    for (int i=d;i>=0;i--)
    {
        printf("%c",ch[i]);
    }
}
```

```
Enter Word: rob
You entered:rob
Reversed Word is: bor
--------------------------------
```

Task 03:

Suppose A, B, C are arrays of integers of size M, N, and (M + N) respectively. Your program should perform the following tasks:

Program & Output

```c
#include<stdio.h>
int main()
{
    int num,j,i;
    int count=0,count1=0,count2=0;
    printf("input Quantity of number for Array A & B: ");
    scanf("%d",&num);

    // part ARRAY *A*
    int arraya[num];
    printf("Enter  Numbers for Array A: \n");
    for (i=0;i<num;i++)  // loop for taking Array *A* as input
    {
        scanf("\n%d",&arraya[i]);
    }
    for (i=0;i<num;i++)  // this loop is for sortinf Array *A*
    {
        for (j=i+1;j<num;j++)
        {
            if(arraya[i]>arraya[j])
            {
                count=arraya[i];
                arraya[i]=arraya[j];
                arraya[j]=count;
            }
        }
    }
    printf("Array A after sorted in ASC:");
```

//code is continue…..

```c
    for (i=0;i<num;i++)  // This loop is printing for Array *A*
    {
        printf("\n\t*%d*",arraya[i]);
    }

    // part ARRAY *B*
    int arrayb[num];
    printf("\nEnter  Numbers for Array B: \n");
    for (i=0;i<num;i++)  //loop for taking Array *B* as input
    {
        scanf("\n%d",&arrayb[i]);
    }
    for (i=0;i<num;i++)  // loop for sorting Array *B*
    {
        for (j=i+1;j<num;j++)
        {
            if(arrayb[i]>arrayb[j])
            {
                count1=arrayb[i];
                arrayb[i]=arrayb[j];
                arrayb[j]=count1;
            }
        }
    }
    printf("Array B after sorted in ASC:");
    for (i=0;i<num;i++)  // loop for printing Array *B* after sorted in ASC
    {
        printf("\n\t*%d*",arrayb[i]);
    }

    // part ARRAY *C*
    int arrayc[num];
    for (i=0;i<num;i++)   //loop for taking Array *C* after *A* *B* merged as input
    {
        arrayc[i]=arraya[i]+arrayb[i];
    }
    printf("\nArray C after sorted:\n");
    for (i=0;i<num;i++) // loop for printing ARRAY *C*  sorted
    {
        printf("\n*%d*",arrayc[i]);
    }
}
```

```
input Quantity of number for Array A & B: 4
Enter  Numbers for Array A:
4
8
9
2
Array A after sorted in ASC:
        *2*
        *4*
        *8*
        *9*
Enter  Numbers for Array B:
5
0
7
1
Array B after sorted in ASC:
        *0*
        *1*
        *5*
        *7*
Array C after sorted:

*2*
*5*
*13*
*16*
--------------------------------
```

Task 04:

Write a C program that declares an array Numbers of 50 components of type int. Initialize the array so that the first 25 components are divisible by 2, and the last 25 components are divisible by 3. Output the array so that 10 elements per line are printed.

Program & Output

```c
#include<stdio.h>
int main()
{
    int i,j,k,count,count1=0,res,hightemp,lowtemp;
    char mon[][10]={"Jan","feb","march","april","may"};
    int temp[][2]={{70,53},{74,56},{78,60},{84,68},{88,73}};
    for ( i=0;i<5;i++)
    {
        printf("\n%s\t",mon[i]);
        for ( j=0;j<2;j++)
        {
            printf("%d ",temp[i][j]);
        }
        printf("\n");
    }
    for ( i=0;i<5;i++)
    {
        count=count+temp[i][0];
    }
    printf("The Average High temprature:%d",count/5);
    for ( i=0;i<5;i++)
    {
        count1=count1+temp[i][1];
    }
    printf("\nThe Average Low Temprature:%d",count1/5);
    for (i=0;i<5;i++)
    for (j=0;j<2;j++)
    {
        if(temp[i][0]>temp[j][0])
        {
            hightemp=temp[i][0];
        }
        else if(temp[i][0]<temp[j][1])
        {
            lowtemp=temp[j][0];
        }
    }
    printf("\nThe Highest Temprature is:%d",hightemp);
    printf("\nThe lowest Temprature is:%d",lowtemp);
}
```

```
Jan     70 53

feb     74 56

march   78 60

april   84 68

may     88 73
The Average High temprature:78
The Average Low Temprature:62
The Highest Temprature is:88
The lowest Temprature is:49
--------------------------------
```

Task 05:

The teacher at a university needs help in grading a True/False test. The test contains the students' IDs and test answers in the form:

1022 TFTTF TFTT

Program & Output

```c
#include<stdio.h>
int main()
{
    int i,j,id;
    float score=0;
    char ch[100];
    printf("Enter your ID: ");
    scanf("%d",&id);
    printf("\nEnter Your Answer: ");
    for (i=0;i<20;i++)
    {
        scanf("%c",&ch[i]);
    }
    printf("%d ",id);
    for (i=0;i<20;i++)
    {
        if(ch[i]=='T')
        {
            printf("%c",ch[i]);
            score=score+1;
        }
        else if (ch[i]=='F')
        {
            printf("%c",ch[i]);
        }
        else if (ch[i]=='\x20')
        {
            printf(" ");
        }
    }
    printf("\nYour Score Out of 10 is :%.1f",score);
    float per;
    per=(score/10)*100;
    printf("\n%f",per);
    if (per>0||per<59.99)
    {
        printf("\nyour grade is: F");
    }
        else if (per>60||per<69.99)
    {
        printf("\nyour grade is: D");
    }
        else if (per>70||per<79.99)
    {
        printf("\nyour grade is: C");
    }
        else if (per>80||per<89.99)
    {
        printf("\nyour grade is: B");
    }
        else if (per>89.99)
    {
        printf("\nyour grade is: A");
    }
}
```

```
Enter your ID: 1024

Enter Your Answer: t
T
F
T
F

T
T
F
F
1024 TFTF TTFF
Your Score Out of 10 is :4.0
40.000000
your grade is: F
--------------------------------
```

Task 06:

Write a program that takes a non-negative integers representing an elevation map where the width of each bar is 1, compute how much water it can trap after raining.

Program & Output

```c
#include<stdio.h>
int main()
{
    int store1=0,store=0,i,j,sum=0,num;
    int temp1[6];
    int temp2[6];
    int a[]={4,2,0,3,2,5};
    int b[]={4,2,0,3,2,5};
    printf("Enter a number of Blocks: ");
    scanf("%d",&num);
    /*int a[num],b[num];
    for (i=0;i<num;i++)
    {
        scanf("%d",&a[i]);
        b[i]=a[i];
    }*/
    for (i=0;i<1;i++)
    {
        for( j=0;j<num;j++)
        {
            if ((a[i]>a[j])||(a[i]=a[j]))
            {
                printf("%d",a[i]);
                temp1[j]=a[i];
            }
            else if (a[j]>a[i])
            {
                printf("%d",a[j]);
                temp1[j]=a[i];
            }
        }
    }
        printf("\n");
    for ( i=num-1;i>num-2;i--)

    {
        for( j=num;j>0;j--)
        {
            if ((a[i]>a[j])||(a[i]=a[j]))
            {
                printf("%d",a[i]);
                temp2[j]=a[i];
            }
            else if (a[j]>a[i])
            {
                printf("%d",a[j]);
                temp2[j]=a[i];
            }
        }
    }
    for (i=0,j=num;i<num,j>0;i++,j--)
    {
        if (temp1[i]<=temp2[j])
        {
            store=temp1[i]-b[i];
            sum=store+sum;
            printf("\n%d",store);
        }
    }
    printf("\nsum%d",sum);
}
```

```
Enter a number of Blocks: 5
44444
55555
0
2
4
1
2
sumIS 9
--------------------------------
```

Task 08:

Create a program that take input from user (Number, Asterisk (*) and Alphabet) and design the following patterns based on user input.

Program & Output

```c
#include<stdio.h>
int main()
{
    char ch;
    printf("Enter a patterns you want to create ");
    printf("\nN/n for number, S/s for start, A/a for alphabet:");
    scanf("%c",&ch);
    int i,k,num;
    printf("Enter Number of Rows: ");
    scanf("%d",&num);
    switch(ch)
    {
        case 'N':
        case 'n':
        {
            for (i=0;i<=num;i++)
            {
                for (k=1;k<=i;k++)
                    {
                        printf("%d",k);
                    }
                printf("\n");
            }
        }
        break;
        case's':
        case'S':
        {
            for (i=0;i<=num;i++)
            {
                for (k=1;k<=i;k++)
                    {
                        printf("*");
                    }
                printf("\n");
            }
        }

        break;
        case'a':
        case'A':
        {
            for (i=0;i<=num;i++)
            {
                for (k=0;k<i;k++)
                    {
                        int alph=65+k;
                        printf("%c",alph);
                    }
                printf("\n");
            }
        }
    }

}
```

```
Enter a patterns you want to create
N/n for number, S/s for start, A/a for alphabet:A
Enter Number of Rows: 5

A
AB
ABC
ABCD
ABCDE

--------------------------------
```

Task 09:

Create a program which adds or subtracts matrices upon user desire. It can add/subtract 2, 3 and 4 3x3 matrices together. Write a program that takes user input:

Program & Output

```c
#include<stdio.h>
int main()
{
    char ch;
    printf("What operation the user wants to perform(-/+):");
    scanf("%c",&ch);
    int matrixA[3][3];
    int matrixB[3][3];
    int matrixC[3][3];
    switch(ch)
    {
        case '+':
        {
            printf("Enter First matrix:\n");
                for (int i=0;i<3;i++)
                {
                    for(int j=0;j<3;j++)
                    {
                        scanf("%d",&matrixA[i][j]);
                    }
                }
                {
                printf("Enter second matrix:\n");
                }
                for (int m=0;m<3;m++)
                {
                    for(int n=0;n<3;n++)
                    {
                        scanf("%d",&matrixB[m][n]);
                    }
                }
                for (int i=0;i<3;i++)
                {
                    for(int j=0;j<3;j++)
                    {
                        printf(" %d",matrixA[i][j]);
                    }
                    if (i==0)
                    {
                        printf(" +");
                        int m=0;
                        for(int n=0;n<3;n++)
                        {
                            printf(" %d",matrixB[m][n]);
                        }
                        printf(" =");
                        for(int j=0;j<3;j++)
                        {
                            matrixC[i][j]=matrixA[i][j]+matrixB[i][j];
                            printf(" %d",matrixC[i][j]);
                        }
                    }
                    if (i==1)
                    {
                        printf("   ");
                        int m=1;
                        for(int n=0;n<3;n++)
                        {
                            printf(" %d",matrixB[m][n]);
                        }
                        printf("   ");
```

```
                int m=1;
                for(int n=0;n<3;n++)
                {
                    printf(" %d",matrixB[m][n]);
                }
                printf("  ");
                for(int j=0;j<3;j++)
                {
                    matrixC[i][j]=matrixA[i][j]+matrixB[i][j];
                    printf(" %d",matrixC[i][j]);
                }
            }
            if (i==2)
            {
                printf("  ");
                int m=2;
                for(int n=0;n<3;n++)
                {
                    printf(" %d",matrixB[m][n]);
                }
                printf("  ");
                for(int j=0;j<3;j++)
                {
                    matrixC[i][j]=matrixA[i][j]+matrixB[i][j];
                    printf(" %d",matrixC[i][j]);
                }
            }
            printf("\n");
        }

    }
```

```
What operation the user wants to perform(-/+):+
Enter First matrix:
4
4
5
6
7
8
9
8
4
Enter second matrix:
4
5
6
8
4
5
6
7
8
 4 4 5 + 4 5 6 = 8 9 11
 6 7 8   3 4 5   9 11 13
 9 3 4   6 7 8   15 10 12

--------------------------------
```