

PPS ASSIGNMENT

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Question 1) You have been given 3 integers - l, r and k. Find how many numbers between l and r (both inclusive) are divisible by k. You do not need to print these numbers; you just have to find their count.

```
#include <stdio.h>
int main(){
    int l,r,k;
    int i,count=0;
    printf("Enter the value of l r k : ");
    scanf("%d %d %d",&l,&r,&k);

    for(i=l;i<=r;i++){

        if(i%k==0){
            count ++;
        }
        else
            count = count;
    }

    printf("The count between %d and %d divisible by %d is %d",l,r,k,count);

    return 0;
}
```

Question 2) Read size of an array A. Enter elements of the array. First print all positive elements then negative elements.

```
#include<stdio.h>
int main()
{
    int arr[100],size,i;
    printf("Enter array size\n");
    scanf("%d",&size);

    printf("Enter array elements\n");
    for(i = 0; i < size; i++)
        scanf("%d",&arr[i]);

    printf("Elements are\n");
    printf("The positive elements of the array\n");
    for(i = 0; i < size; i++){
        if(arr[i] > 0)
            printf("%d\n",arr[i]);
    }
    printf("The negative elements of the array\n");
    for(i=0;i<size;i++){
        if(arr[i]<0)
            printf("%d\n",arr[i]);
    }
    return 0;
}
```

Question 3) Read the elements of a 3x3 matrix. Find sum of elements of both the diagonals separately and print their product.

```
#include<stdio.h>
int main()
{
    int i, j, rows, columns, a[10][10], Sum = 0, Product = 1 ;
    printf("Please Enter Number of rows and columns : \n");
    scanf("%d %d", &i, &j);

    printf("Please Enter the Matrix Elements \n");
    for(rows = 0; rows < i; rows++){
        for(columns = 0; columns < j; columns++){
            scanf("%d", &a[rows][columns]);
        }
    }

    for(rows = 0; rows < i; rows++){
        Sum = Sum + a[rows][rows];
    }

    printf("The Sum of Diagonal Elements of Matrix = %d\n", Sum );

    for(rows = 0; rows < i; rows++){
        Product = Product * a[rows][rows];
    }

    printf("The Product of Diagonal Elements of Matrix = %d", Product );

    return 0;
}
```

Question 4) Justus is a school teacher. He wants to arrange the name of his students in the order of the length. That is, the names should be listed from the shortest to the longest. Help him to automate it by writing a C program.

```
#include <stdio.h>
#include <stdlib.h>
#include <string.h>

int sort_by_length(const char* a, const char* b){
    if(strlen(a) != strlen(b))
        return strlen(a) > strlen(b);
    else
        return strcmp(a, b) > 0;
}

void string_sort(char** arr, const int len, int (*cmp_func)(const char* a, const char* b)){
    for(int i = 1; i < len; i++){
        int j = i;
        char* p = arr[i];

        while(j > 0){
            if((*cmp_func)(arr[j-1], p) > 0 )
                arr[j] = arr[j-1];
            else
                break;
            j--;
        }
        arr[j] = p;
    }
}

int main()
{
    int n;
    printf("Enter the number of students \n");
    scanf("%d", &n);

    char** arr;
    arr = (char**)malloc(n * sizeof(char*));

    printf("Enter the students names \n");
    for(int i = 0; i < n; i++){
        *(arr + i) = malloc(1024 * sizeof(char));
        scanf("%s", *(arr + i));
        *(arr + i) = realloc(*(arr + i), strlen(*(arr + i)) + 1);
    }

    printf("Name of students in the order of the length \n");
    string_sort(arr, n, sort_by_length);
    for(int i = 0; i < n; i++)
        printf("%s\n", arr[i]);
    printf("\n");
}
```