8/6/21
UG-CSE-4B

ADA LAB TEST-1

1BM19CS090
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Q) Implement Johnson Trotter algorithm to generate permutations.

code:

```
# include<stdio.h>
int NN, i, count = 0;
int p[100], pi[100];
int dir[100];
void PrintPerm(){
    int i;
    ~~for~~ count = count +1;
    printf("\n[%d]", count);
    for (i=1 ; i<=N ; ++i)
        printf(" %d", p[i]);
}
void Move (int x, int d){
    int z;
    z = p[pi[x] +d];
    p [pi[x]] = z;
    p[pi[x] +d] = x;
    pi[z] = pi[x];
    pi[x] = pi[x] +d;
}
```

```
void   Perm (int n)
{
    int i;
    if (n > N)
            PrintPerm();
      else {
            Perm (n+1);
             for (i=1; i<=n-1; ++i)
             {
                    Move (n, dir [n]);
                       Perm (n+1);
             }
             dir[n] = dir [n];
        }
}
void  main() {
          printf(" Enter  n: ");
          scanf (" %d", &N);
          for (i =1; i<=N; i++)
           {
                 dir [i] = -1;
                 p [i] = i;
                 pi[i] = i;
           }
             Perm(1);
               printf("\n");
 }
```

Modification: Generate Permutation for ABCD. 1BM19CS090

```
#include <stdio.h>
# include < string.h >
void main ()
{
    char   str[] = "ABCD";
     int  n = strlen (str);
      printf (" Permutations of  ABCD : \n");
       Perm ( str, 0, n );
 }
 void   Perm ( char *str,  int  start, int end)
 {
       char  temp;
        int  i,j;
         for (i = start ; i < end -1 ; ++i ){
                for (j = i+1 ; j < end ; ++j ) {
                       temp = str[i];
                       str[i] = str[j];
                        str[j] = temp;
                          Perm (str , i+1, end);
                          temp = str[i];
                           str[i] = str[j];
                            str[j] = temp;
                    }
             }
               printf("%s\n", str);
 }
```