PROGRAM 3

Implement Johnson Trotter algorithm to generate permutations.

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

```
dir[n] = -dir[n];
}

void main (){
  printf( "Enter number of components: " );
  scanf( "%d", &NN );
  printf( "\n" );
  for (i=1; i<=NN; ++i){
    dir[i] = -1; p[i] = i;
    pi[i] = i;
}
  Perm ( 1 );
  printf( "\n" );
}</pre>
```

OUTPUT:

```
Enter number of components: 4
       2
       1
4
3
       1
       1
               4
                       2
                       2
                       2
       2
                       1
       2
               1
       4
       1
                       3
```

OBSERVATION:

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	Hinchele Litalia.ht	
	# include Leonio.hy	
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	int plicot, pilicot;	
	ent de (100]	
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	int 1;	Harris Harris
	for (i=1; i<=NN; f++i). print ("Yd", pCiJ):	
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	rioid Print Trans (int x, int y)	
	print f (" (rd +d)", v, y); print f (" 10");	
1	print f (" (-1d -1-d)", v, y);	17
	print of ("In")	
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	,	-
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distance of the second	Print Isam (pi(x), pi(x)+d)=	
	Z = p(pI(xJ+dJ;	
	pcpi(x)+aj=x	
100	pi(Z) = piGJ;	
	pi(xJ = pi(xJ+d;	
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	riord Perm (aril n)	
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	int ?;	
	ij (nxon)	
	print Perm ()°,	
	else	12.4

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else	76 A K 1
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perm (n+1);	p & 1 £
for (i =12, i<= n-1; +	+1)
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y	1 19 19 19
dis (n] = -dis (n];	1 1 4 3
y	<u>r.</u> 1 & 3
void main ()	p 1 8 ts
	1 1 6 8
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for (1=1: 1<= NN)	3 4-17) 3 1 13 6,
<i>y</i>	1 1 1 1
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pciJ = i;	7
pcoJ=i;	The state of the s
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Output:	
Enter the number of	components: 4
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4 1 2 3	
4 1 3 2	

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	1342
	1 3 2 4
	3 1 2 4
-	3 1 4 2
	3412
	4312
	4321
	3 4 2)
	3 2 4 1
	3 2 1 1
	2314
	2341
	243)
	4 & 3 1
	4 & 1 3
	2413
	2143
	2134
	28.
	222
	12,