

LAB 3

EXP NO: 3

Merge sort using recursion

13/1/23 Exp-3 Li 1
Merge sort using recursion

```
#include <stdio.h>
int arr[20];
int main()
{
    int n, i;
    printf("Enter the size of array\n");
    scanf("%d", &n);
    printf("Enter the elements of array:");
    for(i=0; i<n; i++)
        scanf("%d", &arr[i]);
    merge-sort(arr, 0, n-1);
    printf("Sorted array:");
    for(i=0; i<n; i++)
        printf("%d\t", arr[i]);
    return 0;
}

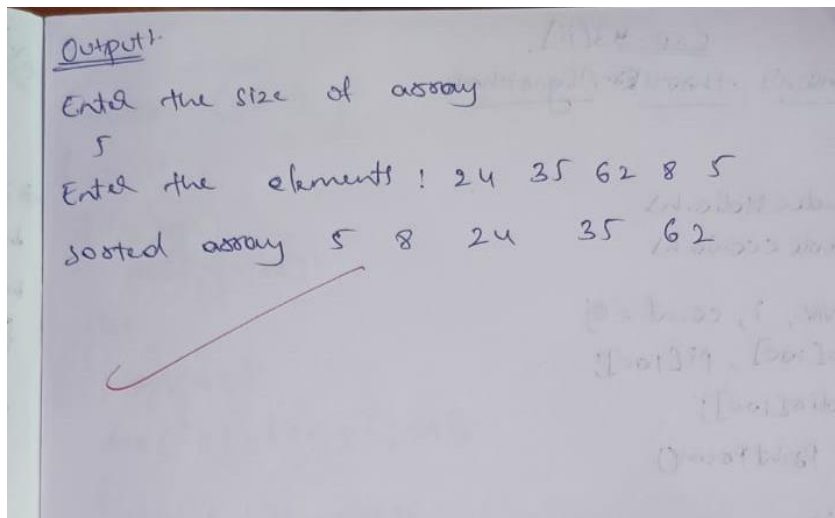
int merge-sort(int arr[], int low, int high)
{
    int mid;
    if(low < high)
    {
        mid = (low + high) / 2;
        merge-sort(arr, low, mid);
        merge-sort(arr, mid+1, high);
        merge(arr, low, mid, high);
    }
}
```

```

return 0;
}

int merge-sort(int arr[], int l, int m, int h)
{
    int arr1[10], arr2[10];
    int n1, n2, i, j, k;
    n1 = m - l + 1;
    n2 = h - m;
    for (i = 0; i < n1; i++)
        arr1[i] = arr[l + i];
    for (j = 0; j < n2; j++)
        arr2[j] = arr[m + j + 1];
    arr1[i] = 9999;
    arr2[j] = 9999;
    i = 0; j = 0;
    for (k = 0; k <= h; k++)
    {
        if (arr1[i] <= arr2[j])
            arr[k] = arr1[i++];
        else
            arr[k] = arr2[j++];
    }
    return 0;
}

```



OUTPUT:

```
C:\Users\STUDENT\Desktop\404\ADA404\bin\Debug\ADA404.exe
Enter the size of array
5
Enter the elements:56 81 74 63 21
Sorted array:    21          56          63          74          81
Process returned 0 (0x0)   execution time : 19.438 s
Press any key to continue.
```

EXP NO: 4

Johnson trotter algorithm

Exp-43[11]
Johnson's Trotter Algorithm

code:-

```
#include <stdio.h>
#include <conio.h>

int NN, i, count = 0;
int p[100], pi[100];
int dis[100];

void printPerm()
{
    int i;
    for (i = 1; i <= NN; i++)
        printf("%d ", 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] + d] = x;
    pi[z] = pi[x];
    pi[x] = pi[x] + d;
}
```

```

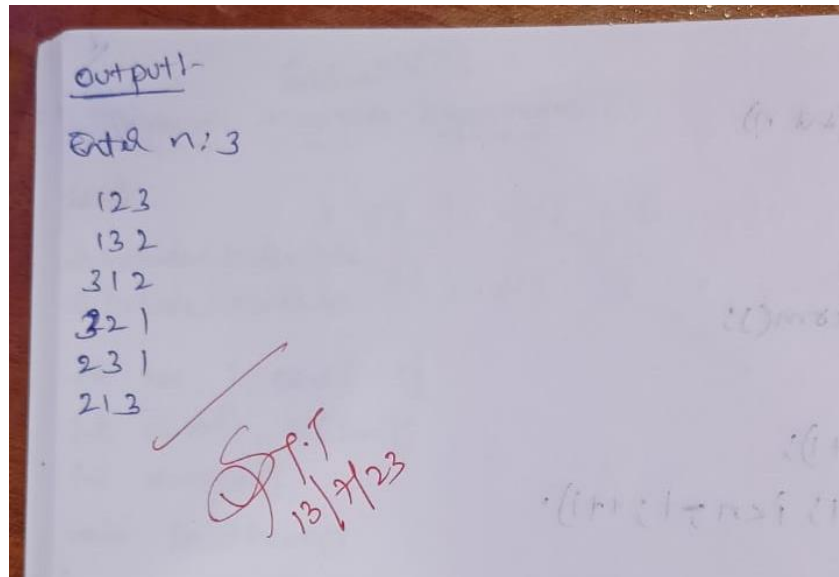
3;
void perm(int n)
{
    int i;
    if (n > NN)
        print perm();
    else
    {
        perm(n+1);
        for (i=1; i < n; i++)
        {
            move(n, dis[n]);
            perm(n+1);
        }
        dis[n] = -dis[n];
    }
}

```

```

3;
void main()
{
    printf("Enter n: ");
    scanf("%d", &NN);
    printf("\n");
    for (i=1; i < NN; i++)
    {
        dis[i] = -1; p[i] = i;
        pi[i] = i;
    }
    perm(1);
    printf("\n");
    getch();
}

```



Output:

```
"C:\Users\B Venkatesh\Desktop\c programming\4th sem\johnson.exe"
Enter n: 4
1234
1243
1423
4123
4132
1432
1342
1324
3124
3142
3412
4312
4321
3421
3241
3214
2314
2341
2431
4231
4213
2413
2143
2134
```