NAME: KURRA VENKATA GOKUL

CH.SC.U4CSE24121

CSE-B

1.BUBBLE SORT

CODE:

```
#include <stdio.h>
// CH.SC.U4CSE24121 - Bubble Sort

void bubbleSort(int a[], int n) {
    int i, j, temp, swapped;
    for (i = 0; i < n - 1; i++) {
        swapped = 0;
        for (j = 0; j < n - i - 1; j++) {
            if (a[j] > a[j + 1]) {
                temp = a[j];
                a[j] = a[j + 1];
                a[j + 1] = temp;
                swapped = 1;
            }
        }
        if (!swapped)
            break;
    }
}

int main() {
    printf("CH.SC.U4CSE24121\n");
    int a[5] = {5, 1, 4, 2, 8};
    int n = 5, i;
    bubbleSort(a, n);
    for (i = 0; i < n; i++)
        printf("%d ", a[i]);
    return 0;
}
```

OUTPUT:

```
C:\Users\kurra\OneDrive\Desktop\SEM IV\DAA>gcc bubble.c

C:\Users\kurra\OneDrive\Desktop\SEM IV\DAA>.\bubble
CH.SC.U4CSE24121
1 2 4 5 8
C:\Users\kurra\OneDrive\Desktop\SEM IV\DAA>
```

2. Insertion Sort

Code:

```
#include <stdio.h>
// CH.SC.U4CSE24121 - Insertion Sort

void insertionSort(int a[], int n) {
    int i, key, j;
    for (i = 1; i < n; i++) {
        key = a[i];
        j = i - 1;
        while (j >= 0 && a[j] > key) {
            a[j + 1] = a[j];
            j--;
        }
        a[j + 1] = key;
    }
}

int main() {
    printf("CH.SC.U4CSE24121\n");
    int a[5] = {12, 11, 13, 5, 6};
    int n = 5, i;
    insertionSort(a, n);
    for (i = 0; i < n; i++)
        printf("%d ", a[i]);
    return 0;
}
```

Output:

```
C:\Users\kurra\OneDrive\Desktop\SEM IV\DAA>gcc -o insert insert.c

C:\Users\kurra\OneDrive\Desktop\SEM IV\DAA>.\insert
CH.SC.U4CSE24121
5 6 11 12 13
C:\Users\kurra\OneDrive\Desktop\SEM IV\DAA>
```

3.selection sort

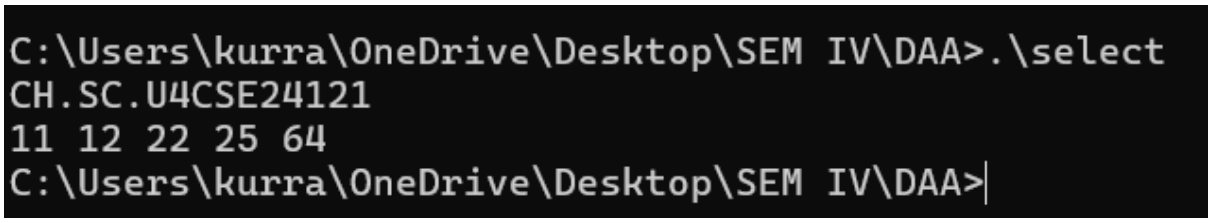
Code:

```
#include <stdio.h>
// CH.SC.U4CSE24121 - Selection Sort

void selectionSort(int a[], int n) {
    int i, j, min, temp;
    for (i = 0; i < n - 1; i++) {
        min = i;
        for (j = i + 1; j < n; j++) {
            if (a[j] < a[min])
                min = j;
        }
        temp = a[i];
        a[i] = a[min];
        a[min] = temp;
    }
}

int main() {
    printf("CH.SC.U4CSE24121\n");
    int a[5] = {64, 25, 12, 22, 11};
    int n = 5, i;
    selectionSort(a, n);
    for (i = 0; i < n; i++)
        printf("%d ", a[i]);
    return 0;
}
```

Output:


C:\Users\kurra\OneDrive\Desktop\SEM IV\DAA>.\select
CH.SC.U4CSE24121
11 12 22 25 64
C:\Users\kurra\OneDrive\Desktop\SEM IV\DAA>

4.bucket sort

Code:

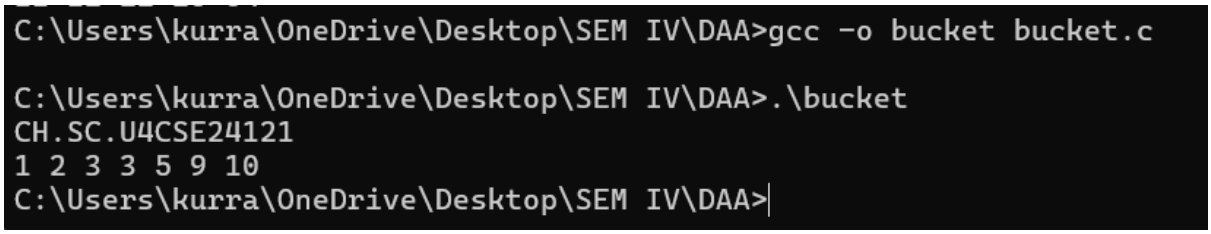
```
#include <stdio.h>
// CH.SC.U4CSE24121 - Bucket Sort

void bucketSort(int a[], int n) {
    int bucket[100] = {0};
    int i;
    for (i = 0; i < n; i++)
        bucket[a[i]]++;

    int index = 0;
    for (i = 0; i < 100; i++) {
        while (bucket[i] > 0) {
            a[index++] = i;
            bucket[i]--;
        }
    }
}

int main() {
    printf("CH.SC.U4CSE24121\n");
    int a[7] = {10, 3, 5, 2, 9, 3, 1};
    int n = 7, i;
    bucketSort(a, n);
    for (i = 0; i < n; i++)
        printf("%d ", a[i]);
    return 0;
}
```

Output:


C:\Users\kurra\OneDrive\Desktop\SEM IV\DAA>gcc -o bucket bucket.c
C:\Users\kurra\OneDrive\Desktop\SEM IV\DAA>.\bucket
CH.SC.U4CSE24121
1 2 3 3 5 9 10
C:\Users\kurra\OneDrive\Desktop\SEM IV\DAA>

5. Max heap

Code:

```
#include <stdio.h>
// CH.SC.U4CSE24121 - Max Heap

void maxHeapify(int a[], int n, int i) {
    int largest = i;
    int left = 2 * i + 1;
    int right = 2 * i + 2;
    int temp;

    if (left < n && a[left] > a[largest])
        largest = left;
    if (right < n && a[right] > a[largest])
        largest = right;

    if (largest != i) {
        temp = a[i];
        a[i] = a[largest];
        a[largest] = temp;
        maxHeapify(a, n, largest);
    }
}

void buildMaxHeap(int a[], int n) {
    int i;
    for (i = n / 2 - 1; i >= 0; i--)
        maxHeapify(a, n, i);
}

int main() {
    printf("CH.SC.U4CSE24121\n");
    int a[6] = {3, 9, 2, 1, 4, 5};
    int n = 6, i;
    buildMaxHeap(a, n);
    for (i = 0; i < n; i++)
        printf("%d ", a[i]);
    return 0;
}
```

Output:

```
C:\Users\kurra\OneDrive\Desktop\SEM IV\DAA>gcc -o heap heap.c

C:\Users\kurra\OneDrive\Desktop\SEM IV\DAA>.\heap
CH.SC.U4CSE24121
9 4 5 1 3 2
C:\Users\kurra\OneDrive\Desktop\SEM IV\DAA>
```

6.Min Heap

Code:

```
#include <stdio.h>
// CH.SC.U4CSE24121 - Min Heap

void minHeapify(int a[], int n, int i) {
    int smallest = i;
    int left = 2 * i + 1;
    int right = 2 * i + 2;
    int temp;

    if (left < n && a[left] < a[smallest])
        smallest = left;
    if (right < n && a[right] < a[smallest])
        smallest = right;

    if (smallest != i) {
        temp = a[i];
        a[i] = a[smallest];
        a[smallest] = temp;
        minHeapify(a, n, smallest);
    }
}

void buildMinHeap(int a[], int n) {
    int i;
    for (i = n / 2 - 1; i >= 0; i--)
        minHeapify(a, n, i);
}

int main() {
    printf("CH.SC.U4CSE24121\n");
    int a[6] = {3, 9, 2, 1, 4, 5};
    int n = 6, i;
    buildMinHeap(a, n);
    for (i = 0; i < n; i++)
        printf("%d ", a[i]);
    return 0;
}
```

Output:

```
C:\Users\kurra\OneDrive\Desktop\SEM IV\DAA>gcc -o mheap mheap.c

C:\Users\kurra\OneDrive\Desktop\SEM IV\DAA>.\mheap
CH.SC.U4CSE24121
1 3 2 9 4 5
```

7.BFS

Code:

```
#include <stdio.h>
#define MAX 100
// CH.SC.U4CSE24121 - BFS

int queue[MAX], front = 0, rear = 0;

void enqueue(int x) {
    queue[rear++] = x;
}

int dequeue() {
    return queue[front++];
}

void bfs(int graph[MAX][MAX], int n, int start) {
    int visited[MAX] = {0};
    int i, node;

    enqueue(start);
    visited[start] = 1;

    while (front != rear) {
        node = dequeue();
        printf("%d ", node);
        for (i = 0; i < n; i++) {
            if (graph[node][i] == 1 && !visited[i]) {
                visited[i] = 1;
                enqueue(i);
            }
        }
    }
}

int main() {
    printf("CH.SC.U4CSE24121\n");
    int n = 4;
    int graph[MAX][MAX] = {
        {0,1,1,0},
        {1,0,1,1},
        {1,1,0,0},
        {0,1,0,0}
    };
    bfs(graph, n, 0);
    return 0;
}
```

Output:

```
C:\Users\kurra\OneDrive\Desktop\SEM IV\DAA>gcc -o bfs bfs.c

C:\Users\kurra\OneDrive\Desktop\SEM IV\DAA>.\bfs
CH.SC.U4CSE24121
0 1 2 3
```

8.DFS

Code:

```
#include <stdio.h>
#define MAX 100
// CH.SC.U4CSE24121 - DFS

void dfs(int graph[MAX][MAX], int visited[], int n, int node) {
    int i;
    visited[node] = 1;
    printf("%d ", node);

    for (i = 0; i < n; i++) {
        if (graph[node][i] == 1 && !visited[i])
            dfs(graph, visited, n, i);
    }
}

int main() {
    printf("CH.SC.U4CSE24121\n");
    int n = 4, i;
    int visited[MAX] = {0};
    int graph[MAX][MAX] = {
        {0,1,1,0},
        {1,0,1,1},
        {1,1,0,0},
        {0,1,0,0}
    };
    dfs(graph, visited, n, 0);
    return 0;
}
```

Output:

```
C:\Users\kurra\OneDrive\Desktop\SEM IV\DAA>gcc -o dfs dfs.c

C:\Users\kurra\OneDrive\Desktop\SEM IV\DAA>.\dfs
CH.SC.U4CSE24121
0 1 2 3
```