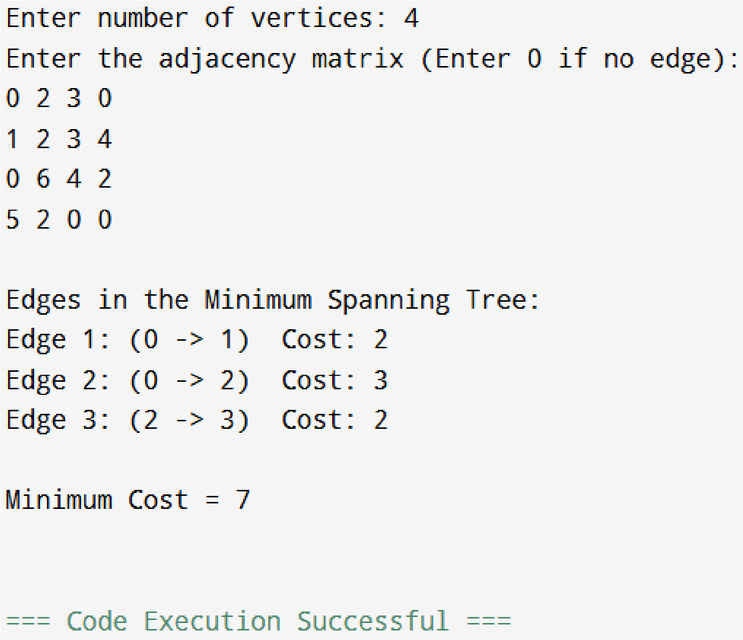
Experiment 35: Prim’s Algorithm

Code:

```
#include <stdio.h>
#define INF 9999
#define MAX 20
int main() {
    int cost[MAX][MAX];
    int visited[MAX] = {0};
    int n, i, j, ne = 1;
    int min, a, b, u, v, total = 0;
    printf("Enter number of vertices: ");
    scanf("%d", &n);
    printf("Enter the adjacency matrix (Enter 0 if no edge):\n");
    for (i = 0; i < n; i++) {
        for (j = 0; j < n; j++) {
            scanf("%d", &cost[i][j]);
            if (cost[i][j] == 0)
                cost[i][j] = INF;
        }
    }
    visited[0] = 1;
    printf("\nEdges in the Minimum Spanning Tree:\n");
    while (ne < n) {
        min = INF;
        for (i = 0; i < n; i++) {
            if (visited[i]) {
                for (j = 0; j < n; j++) {
                    if (!visited[j] && cost[i][j] < min) {
                        min = cost[i][j];
                        a = u = i;
                        b = v = j;
                    }
                }
            }
        }
        if (!visited[v]) {
            printf("Edge %d: (%d -> %d)  Cost: %d\n", ne++, a, b, min);
            total += min;
            visited[b] = 1;
        }
        cost[a][b] = cost[b][a] = INF;
    }
    printf("\nMinimum Cost = %d\n", total);
    return 0;
}
```

Output:



```
Enter number of vertices: 4
Enter the adjacency matrix (Enter 0 if no edge):
0 2 3 0
1 2 3 4
0 6 4 2
5 2 0 0

Edges in the Minimum Spanning Tree:
Edge 1: (0 -> 1)  Cost: 2
Edge 2: (0 -> 2)  Cost: 3
Edge 3: (2 -> 3)  Cost: 2

Minimum Cost = 7


=== Code Execution Successful ===
```