

```
#include <stdio.h>
#include <stdlib.h>
#include <stdbool.h>
```

```
#define V 5
```

```
struct Edge {
    int src, dest, weight;
};
```

```
struct subset {
    int parent;
    int rank;
};
```

```
int find(struct subset subsets[], int i);
void Union(struct subset subsets[], int x, int y);
int compare(const void* a, const void* b);
void KruskalMST(struct Edge edges[]);
```

```
int find(struct subset subsets[], int i) {
    i
    if (subsets[i].parent != i)
        subsets[i].parent = find(subsets, subsets[i].parent);

    return subsets[i].parent;
}
```

```
void Union(struct subset subsets[], int x, int y) {
    int xroot = find(subsets, x);
    int yroot = find(subsets, y);
```

```

if (subsets[xroot].rank < subsets[yroot].rank)
    subsets[xroot].parent = yroot;
else if (subsets[xroot].rank > subsets[yroot].rank)
    subsets[yroot].parent = xroot;
else {

    subsets[yroot].parent = xroot;
    subsets[xroot].rank++;
}
}

```

```

int compare(const void* a, const void* b) {
    struct Edge* edge1 = (struct Edge*)a;
    struct Edge* edge2 = (struct Edge*)b;
    return edge1->weight - edge2->weight;
}

```

```

void KruskalMST(struct Edge edges[]) {
    struct Edge result[V];
    int e = 0;

```

```

    qsort(edges, V, sizeof(edges[0]), compare);

```

```

    struct subset* subsets = (struct subset*)malloc(V * sizeof(struct subset));

```

```

    for (int v = 0; v < V; ++v) {
        subsets[v].parent = v;
        subsets[v].rank = 0;
    }

```

```

    while (e < V - 1 && edges[e].weight != 0) {

```

```

    struct Edge next_edge = edges[e++];

    int x = find(subsets, next_edge.src);
    int y = find(subsets, next_edge.dest);

    if (x != y) {
        result[e - 1] = next_edge;
        Union(subsets, x, y);
    }
}

printf("Edges in the Minimum Spanning Tree:\n");
for (int i = 0; i < e - 1; ++i)
    printf("%d - %d: %d\n", result[i].src, result[i].dest, result[i].weight);

free(subsets);
}

int main() {

    struct Edge edges[] = {
        {0, 1, 2},
        {0, 3, 6},
        {1, 2, 3},
        {1, 3, 8},
        {1, 4, 5},
        {2, 4, 7},
        {3, 4, 9}
    };

    KruskalMST(edges);

    return 0;
}

```