

Minimum Spanning Tree \rightarrow

N nodes
 M edges

Spanning tree \rightarrow
A tree in which we have N nodes & $N-1$ edges & "all nodes are reachable from all other nodes".

MST \rightarrow Tree having the least edge sum or weight sum $\hat{=}$ MST.

$\text{MST sum} = 16$

$2 + 3 + 4 + 9 = 18$

Given a graph draw the MST \rightarrow

MST \rightarrow sum = 17

6 nodes
 $6-1=5$ edges

Prim's Algorithm \rightarrow Minimum Spanning Tree

[sum, edges] Sum = $[0 + 1 + 1 + 2 + 1]$

src \rightarrow

MST = $\{(0,1), (1,2), (2,3), (3,4)\}$

vis[] =

1	1	1	1	1
0	1	2	3	4

MST sum = 5

if node is visited skip \rightarrow continue

(wt, node, parent)
(min-heap)

* In a given graph, get the MST sum & all the edges of the MST.

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int pair<int, int>
dist pair<node, parent>
0 0 -1
```

Minheap
vector<int, pair<int, int>,
greater vector<int, pair<int, int>

* Bellman Ford \rightarrow Shortest dist
(Relaxation) negative weights

* Kruskal's Algo

\rightarrow Disjoint Set

Kosaraju's
Algo

\rightarrow findparent() \rightarrow Union

* Strongly Connected Components

① Rank
② Size