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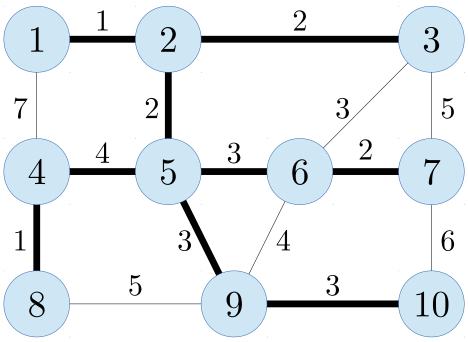
Datenstrukturen & Algorithmen   Programming Exercise 9   FS 13

In this exercise we are going to implement Kruskal's algorithm for the *minimum spanning tree problem*. This problem is defined as follows. Given an undirected graph $G = (V, E)$ with the edge cost function $c : E \to \mathbb{Q}^+$, we search for an acyclic subset $T \subseteq E$ that connects all vertices in V (i.e., a tree) and whose total cost $\sum_{e \in T} c(e)$ is minimum among all possible trees. The following image shows an example where the bold edges form a minimum spanning tree of the graph.



Input The first line contains only the number t of test instances. After that, we have exactly one line per test instance containing the description of the input graph $G = (V, E)$ in the form $n, m, u_1, v_1, c_1, ..., u_m, v_m, c_m$. We have $1 \leq n, m \leq 10000$ with $V = \{1, ..., n\}$ and $|E| = m$. For every i, $1 \leq i \leq m$, the numbers $u_i, v_i \in \{1, ..., n\}$ define the edge $\{u_i, v_i\} \in E$ having a cost of c_i, $1 \leq c_i \leq 1000$.

Output For every test instance we output only one line. This line contains the cost of a minimum spanning tree.

Example

Input:

```
1
10 15 1 2 1 2 3 2 1 4 7 2 5 2 3 6 3 3 7 5 4 5 4 5 6 3 6 7 2 4 8 1 5 9 3 6 9 4 7 10 6 8 9 5 9 10 3
```

Output:

```
21
```

Hand-in: until Wednesday, 8th May 2013.