1.1 The Topic

Citing a reference [CW87].

A description list.

Part a: The first part.

Part b: The second part.

Part c: The last part.

An itemized list.

• Item #1.

• Item #2.

A numbered list.

1. First

2. Second

1.1.1 Statements of Results

Definition 1.1.1 Define your problem here.

Theorem 1.1.2 A theorem.

Lemma 1.1.3 A helpful lemma.

Proof: Proof of the lemma goes here.

Now we can prove Theorem 1.1.2.

Proof of Theorem 1.1.2 Follows from Lemma 1.1.3
1.2 Some Formulas and Algorithms

1.2.1 A Linear Program

Consider linear program \((TSP-LP)\) below.

\[
\begin{align*}
\text{minimize:} & \quad \sum_e c(e) \cdot x_e \\
\text{subject to:} & \quad x(\delta(S)) \geq 2 \text{ for each cut } \emptyset \subsetneq S \subsetneq V \quad (1.2.1) \\
& \quad x(\delta(v)) = 2 \text{ for each vertex } v \in V \quad (1.2.2) \\
& \quad x \geq 0
\end{align*}
\]

Constraints \((1.2.1)\) are the cut constraints and Constraints \((1.2.2)\) are the degree constraints.

1.2.2 Tips

Use \(\log n\), not \(\log n\).

\(V = \{v_1, v_2, \ldots, v_n\}\).

Check out \(\sum_{i=1}^{n} i \) vs. \(\sum_{i=1}^{n} i\).

A displayed equation:

\[
H_n = \sum_{k=1}^{n} \frac{1}{k} = \int_{1}^{n} \frac{dx}{x} + O(1) = \ln n + O(1)
\]

A matrix:

\[
\begin{pmatrix}
 x_1 & y_1 & z_1 \\
 x_2 & y_2 & z_2 \\
 0 & 0 & 1
\end{pmatrix}
\]

Problem names should look like this: SET COVER.

1.2.3 An Algorithm

**Algorithm 1** Kruskal’s Minimum Spanning Tree Algorithm

**Input:** Undirected graph \(G = (V, E)\) with edge costs \(c(e) \geq 0, e \in E\).

**Output:** A minimum spanning tree of \(G\).

\[
T \leftarrow \emptyset
\]

for each edge \(e \in E\) in increasing order of cost \(c(e)\) do

if \(T \cup \{e\}\) does not contain a cycle then

\(T \leftarrow T \cup \{e\}\)

end if

end for

return \(T\)
References

CW87 D. Coppersmith and S. Winograd, Matrix multiplication via arithmetic progressions, 

S69 V. Strassen, Gaussian Elimination Is Not Optimal, Numerische Mathematik 13, 1969, 

P84 V. Pan, How To Multiply Matrices Faster, Springer-Verlag, Lecture Notes in Computer 