

1 Minimal Spanning Tree Algorithm

1.1 Introduction

This project mainly contains

- Prim Algorithm
- Kruskal Algorithm

1.2 Prim Algorithm

1.2.1 Pseudo code

Algorithm 1 Prim algorithm

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1: function PRIM( $V, E$ )                                ▷  $V$  denotes vertices,  $E$  denotes edges
Require: A weighted, connected map which vertices set as  $V$  and edges set as  $E$ .
Ensure: Using sets  $V_{new}$  and  $E_{new}$  which describe the minimal spanning tree.
2:    $V_{new} \leftarrow \{x\}$                                 ▷  $x \in V$ ,  $x$  as the start vertex
3:    $E_{new} \leftarrow \{\}$                                 ▷ set  $E_{new}$  as empty set
4:   while  $V_{new} \neq V$  do
5:     Find the minimal edge  $\langle u, v \rangle$  from  $E$ , s.t.  $u \in V_{new}, v \notin V_{new}, v \in V$  ▷ If there were
     multi answers, choose one randomly
6:     Push  $v$  in  $V_{new}$  and push  $\langle u, v \rangle$  in  $E_{new}$ 
7:   end while
8: end function

```

1.2.2 Flowchart

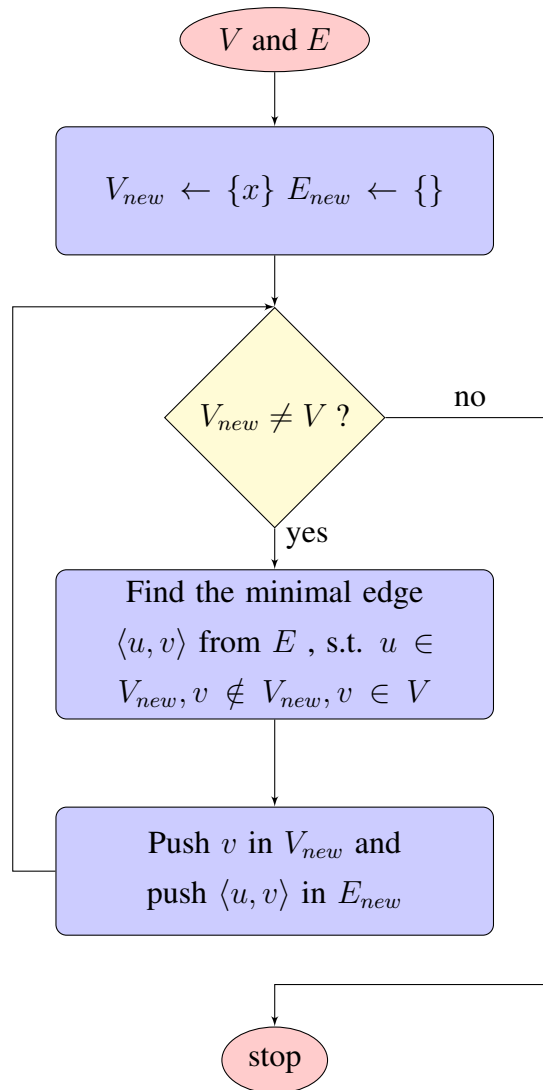


图 1: Prim algorithm flowchart

1.3 Kruskal Algorithm

1.3.1 Pseudo Code

Code here

1.3.2 Flowchart

Flow chart here