

CHAPTER 4

ANALYSIS AND DESIGN

4.1 Analysis

The minimum spanning tree implementation is to solve the problems that exist on the weighted and non-directional graphs. The graph consists of nodes and edges. Graph creation begins with the determination of nodes. The nodes will then be connected to other nodes and assigned weights to form edges.

To start the analysis on this project required a floor plan of a building. Mapping is then done by specifying the socket and the switch as nodes. In this case nodes are marked $v1, v2, v3 \dots v33$. The next step is to connect the nodes one with another with various possible paths so that all nodes can be connected.

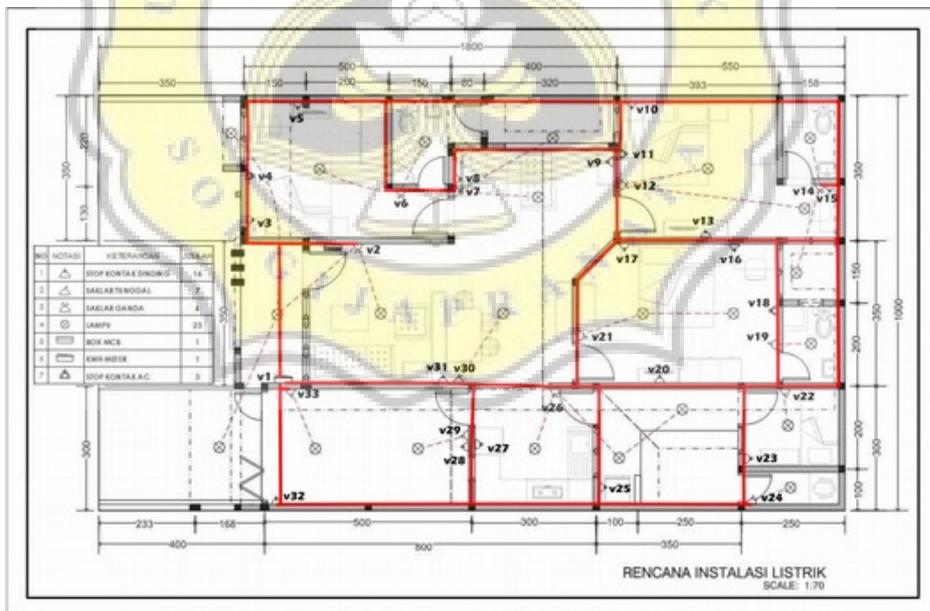


Illustration 4.1: Building Sample Plan

4.2 Desain

The flowchart design to solve the problem on this project is as shown below:

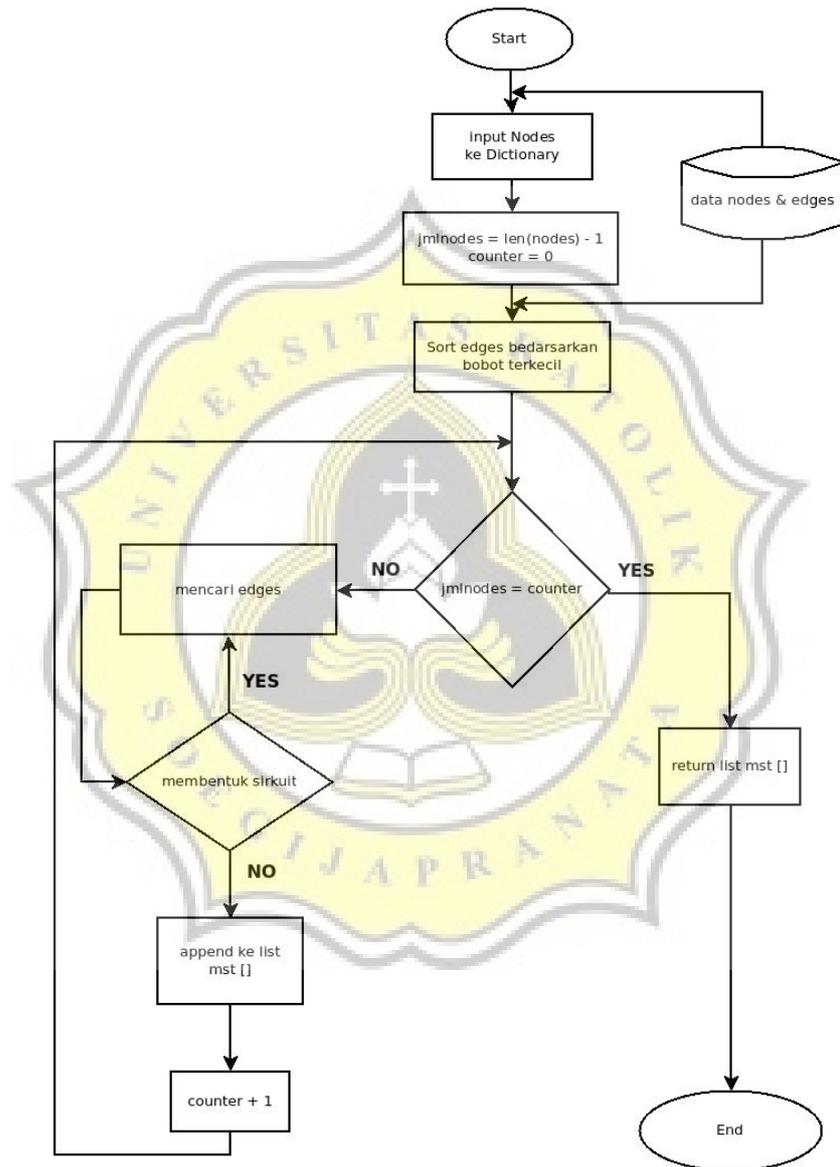


Illustration 4.2: Flowchart

Based on the above flowchart illustrated that the data nodes and edges stored in the txt file for further loaded by the program. Initiation of the number of nodes and counters is required so that the program can know how many edges have been selected and stop the process. In this case the number of nodes is entered into the variable **jmlnodes** with the number of nodes minus 1. So when the **jmlnodes** variable is equal to the **counter**, the minimum spanning tree search process ends.

To start a minimum spanning tree search, all edges must first be sorted by the smallest weights to the largest. The program will start checking edges with the smallest weights. If the edges in the check form a circuit, then the program will look for other edges to check. However, if the edges in the check do not form the circuit, then the edges are appended into the minimum spanning tree list. After successful append process, then the variable **counter** increases 1. This indicates the existence of edges stored in the list.

This process will continue until the **counter** variable is the same as the **jmlnodes** variable. When the process has reached that status the minimum spanning tree has been found and the program stops.