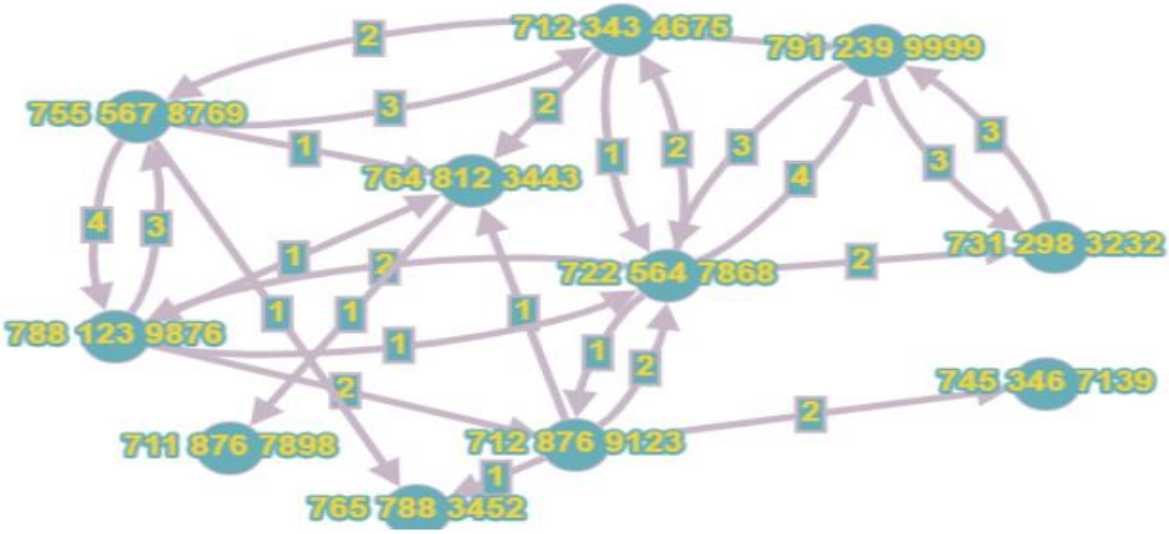
Graph Modelling – Communications Network

Graphs can be used to model telephone calls made in a network. In particular, a directed graph (edges have directions) can be used to model calls where each telephone number is represented by a vertex and each telephone call is represented by a directed edge. The edge representing a call starts at the telephone number **from** which the call was made and ends at the telephone number **to** which the call was made. We need directed edges because the direction in which the call is made matters. A small telephone call graph is displayed below. The labels on the edges are the weights of those edges and they represent each call that was made from a particular telephone number to a second telephone number.

Call Graph G



This graph shows for instance, 4 calls were made from 755-567-8769 to 788-123-9876 and 3 in the other direction. We also see that 1 call was made from 712-876-9123 to 764-812-3443 but none in the other direction. We also see that 745-346-7139 did not call anybody in this communication network , but received two calls from 712-876-9123. When we care only whether there has been a call connecting two telephone numbers, we use an undirected graph with an edge connecting telephone numbers when there has been a call between these numbers.