Project - D-REGULAR GRAPHS

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December 2, 2018

1 Introduction

In graph theory, a regular graph is a graph where each vertex has the same number of neighbors; i.e. every vertex has the same degree or valency.
A regular directed graph must also satisfy the stronger condition that the indegree and outdegree of each vertex are equal to each other.
So we made graphs using tikz.

2 What we did

2.1 Procedure

Using latex and tikz we started like this.....

1. We used python for this project in which we made a tex file of desired graphs.
2. We kept terminal commands in python code itself i.e, pdflatex and evince.
3. In tex file first created nodes as vertices according to input using for loops.
4. Then we connected the nodes.
   For directed we connected the nodes the way they are given in input matrix.
   For undirected we just connected each node with every other node.
5. Atlast in case of directed graphs we labelled the edges according to their weight.

2.2 Improvements

We corrected our problem of giving inputs manually.....

1. We wrote the full code of latex in python program itself.
   Thus when python program was running it compiled and executed the latex code.

2. We removed the tex file after the work is done for preventing overwriting.

3 Real life applications

Here are some notable applications of these graphs

1. The link structure of a website can be represented by a directed graph, in which the vertices represent web pages and directed edges represent links from one page to another.

2. Graphs are also widely used in sociology as a way, for example, to measure actors' prestige or to explore rumor spreading, notably through the use of social network analysis software.

3. Graphs are useful in geometry and certain parts of topology such as knot theory.

4. Graphs ae used for looking at breeding patterns or tracking the spread of disease, parasites or how changes to the movement can affect other species.

5. Weighted graphs are commonly used to program GPS's, and travel-planning search engines that compare flight times and costs.

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