University of South Carolina
Math 574: Discrete Mathematics I
Section 001
Summer I 2012

Homework Set 13

Pre-Class Homework Due: 6-20
Post-Class Homework Due: 6-26

Matrix Representations of Graphs

Before Class

- Nothing for today.

After Class

- Let

$$A = \begin{bmatrix} 1 & 1 & 2 \\ 1 & 0 & 1 \\ 2 & 1 & 0 \end{bmatrix}.$$

  How many walks of length two are there from v_1 to v_3? (Assume row i and column i corresponding to the vertex v_i.) Draw the graph and list all the walks to confirm your calculations.

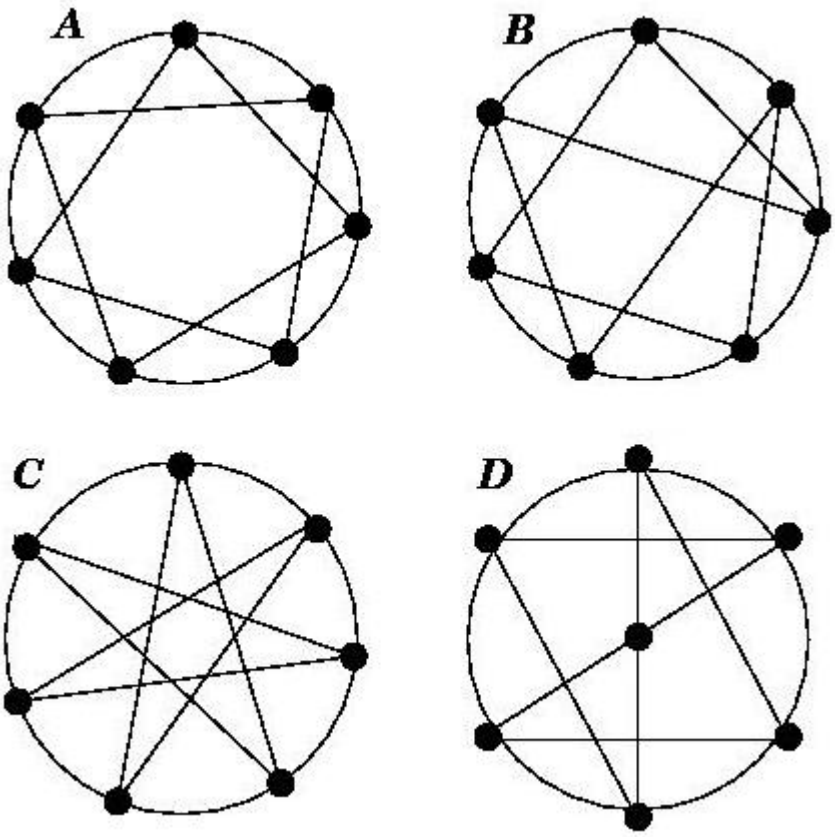
Isomorphisms of Graphs

Before Class

- Nothing for today.

After Class

- Draw two nonisomorphic, 3-regular (every vertex has degree 3) graphs. (It can be done with as few as six vertices. Notice this is a very strong example of two nonisomorphic graphs having the same degree sequence.) Tell why your two graphs are nonisomorphic.
- Draw all nonisomorphic graphs on four vertices. (There are eleven of them. Don't forget about disconnected graphs.) You do not need to tell why the graphs are nonisomorphic.
- Decide which of the following graphs are isomorphic. For those that are not, explain why not. For those that are, demonstrate the isomorphism by labelling the vertices. (First look for invariants that distinguish one graph from another. If you can't find any, then try to establish an isomorphism.)


A
B
C
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