
Modify definition of a graph as follows:

Graph: edge $\leftrightarrow$ unordered pair of vertices $uv$

digraph: arcs $\leftrightarrow$ ordered pair of vertices $(u, v)$
This arc is from \( v \) to \( w \).

\( D \) consists of: a set \( V(D) \), and an (unordered) list of ordered pairs \( A(D) \).

\[ V(D) = \{ v, w, q \} \]
\[ A(D) = \{ (v, w), (w, v), (w, q), (q, q) \} \]
Simple, no loops in the arc list:

(a, b), \ldots, (a, b)

\hspace{1cm}

loop, multiple arcs, simple.

\hspace{1cm}

\hspace{1cm}

(a \rightarrow b) multiple.

\hspace{1cm}

multiple arcs?

\hspace{1cm}

no.
The underlying graph is not simple.
Isomorphism

Def'n by example:

From 1 to 2.
play beams.html < midterm problem

play traffic.html
    traffic2.html
    traffic3.html

a "good enough"

solution to

Coralville, Montevista,
Lomas intusedia

no claim to
having found the
best solution.