

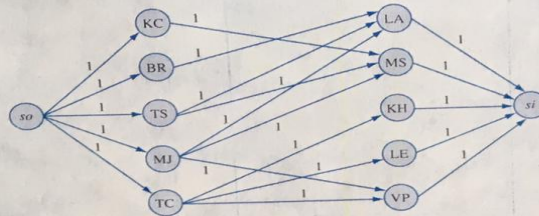
Eksamens

vikamaskalenko

May 2019

Viktorija Maskalenko REBCO4

FIGURE 8
Network for
Matchmaker



ample, if the matchmaker pairs KC and MS, BR and LA, MJ and VP, and TC and KH, a flow of 4 from source to sink would be obtained. (This turns out to be a maximum flow for the network.)

To see why our network representation correctly models the matchmaker's problem, note that because the arc joining each woman to the sink has a capacity of 1, conservation of flow ensures that each woman will be matched with at most one man. Similarly, because each arc from the source to a man has a capacity of 1, each man can be paired with at most one woman. Because arcs do not exist between noncompatible mates, we can be sure that a flow of k units from source to sink represents an assignment of men to women in which k compatible couples are created.

Solving Maximum-Flow Problems with LINGO

The maximum flow in a network can be found using LINDO, but LINGO greatly lessens the effort needed to communicate the necessary information to the computer. The following LINGO program (in the file Maxflow.lng) can be used to find the maximum flow from source to sink in Figure 6.

Maxflow.lng

```
MODEL:
1)SETS:
2)NODES/1..5//
3)ARCS(NODES,NODES)/1,2 1,3 2,3 2,4 3,5 4,5 5,1/
4):CAP, FLOW;
5)ENDSETS
6)MAX=FLOW (5,1);
7)@FOR(ARCS(I,J):FLOW(I,J)<CAP(I,J));
8)@FOR(NODES(I):@SUM(ARCS(J,I):FLOW(J,I))
9)=@SUM(ARCS(I,J):FLOW(I,J)));
10)DATA:
11)CAP=2,3,3,4,2,1,1000;
12)ENDDATA
END
```

If some nodes are identified by numbers, then LINGO will not allow you to identify other nodes with names involving letters. Thus, we have identified node 1 in line 2 with node *so* in Figure 6 and node 5 in line 2 with node *si*. Also nodes 1, 2, and 3 in Figure 6 correspond to nodes 2, 3, and 4, respectively, in line 2 of our LINGO program. Thus, line 2 defines the nodes of the flow network. In line 3, we define the arcs of the network by listing them (separated by spaces). For example, 1, 2 represents the arc from the source to node 1 in Figure 6 and 5,1 is the artificial arc. In line 4, we indicate that an arc capacity and a flow are associated with each arc. Line 5 ends the definition of the relevant sets.

In line 6, we indicate that our objective is to maximize the flow through the artificial arc (this equals the flow into the sink). Line 7 specifies the arc capacity constraints; for

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Horizontal Line Options in LaTeX By demand73164 ShareShare on Facebook LaTeX, an open source document preparation and typesetting system, takes an alternative approach to word processing compared with a conventional word processor. Rather than provide a set of graphical buttons and show the results immediately after an edit, LaTeX documents contain programming commands that specify how a document looks, and typically multiple options are given to allow the writer to refine the look exactly as they like. A good example of this are the five different options for drawing horizontal lines in LaTeX.

A woman's hands typing on a keyboard credit: Monkey Business Images/Monkey Business/Getty Images

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```

\documentclass{article}
% \documentclass{standalone}
\usepackage[utf8]{inputenc}
\usepackage{graphicx}
\usepackage{neuralnetwork}
\usepackage[outline]{contour}
\usepackage[T1]{fontenc}
\usepackage{xcolor}
\usepackage{xparse}
\usepackage[x11names]{xcolor}
\usepackage{setspace}
\usepackage{tikz}
\usepackage[textwidth = 16cm]{geometry}
\usepackage[papersize={21cm,29.7cm}]{geometry}
\title{Eksamens}
\author{vikamaskalenko }
\date{May 2019}
\begin{document}
\maketitle
Viktorija Maskalenko REBC04

\includegraphics[width=\textwidth,height=16cm]{Exam.jpeg}
\newpage
\small
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By demand73164
ShareShare on Facebook
LaTeX, an open source document preparation and typesetting system, takes an alternative approach to word processing
A woman's hands typing on a keyboard
credit: Monkey Business Images/Monkey Business/Getty Images
% \hrule
\color{blue!200}\rule{\linewidth}{4pt}
\color{black}
% \hline
\setlength{\parskip}{3mm}
\parindent=0cm
\contour{blue!100}{Solving Maximum-Flow Problems with LINGO}

The maximum flow in a network can be found using LINDO, but LINGO greatly lessens
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\scriptsize
\renewcommand{\baselinestretch}{0.3}

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\newpage
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\begin{verbatim}
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  cods
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