

DESIGNING AN ALL-INCLUSIVE DEMOCRACY

Peter Emerson (Ed.)

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DECISION-MAKER

A computer program for committees, councils, assemblies and parliaments,
to facilitate the resolution of any group discussion, no matter how
contentious or divisive the subject matter.

The Author:

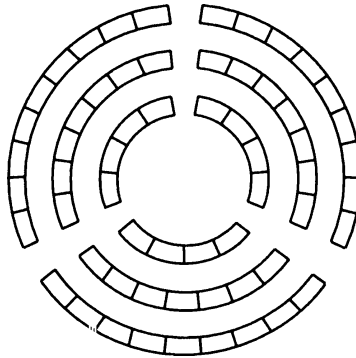
PETER EMERSON
DIRECTOR, THE DE BORDA INSTITUTE
36 BALLYSILLAN ROAD
BELFAST BT14 7QQ
N IRELAND
00 44 28 90 711 795
pemerson@deborda.org
www.deborda.org

The Programmer:

ALAN SCOTT
alan.scott@dnet.co.uk

THE DE BORDA INSTITUTE

FOR THE PROMOTION OF INCLUSIVE VOTING PROCEDURES



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CONTENTS

Introduction	iv
System Requirements	iv
Installation	v
Program Description	vii
The Ballot Paper	vii
The Vote, Entering the Votes	viii
Valid and Partial Votes, The Vote Audit	ix
Results, Simultaneous Programs, Examples	x
Electoral Systems, Exit	xi
Uninstallation	xi
Solutions to Typical Problems	xi
Storing and Retrieving Data	xii
Helpdesk Contacts	xii
Index and Abbreviations	xii

INTRODUCTION

It is an amazing fact, but while modern technology is capable of so much, politicians continue to use the most ancient of all decision-making voting procedures, the simple two-option majority vote. There again, lots of us use this divisive and primitive procedure when we meet in committees in our local community groups, in AGMs of our professional organisations, in trades union congresses, NGOs and at company board meetings.

Another source of amazement lies in the following: while many people discuss the merits and demerits of various electoral voting systems, very few accept that there are also lots of different decision-making voting systems. In fact, there is everything from the two-option majority vote-cum-plurality vote, to the modified Borda count, MBC, (or preferendum, as it used to be called). When societies (and parliaments!) switch to electronic voting, procedures such as MBC and Condorcet are almost bound to be used, (eventually), for these counts will be seen to be more accurate and, therefore, more democratic.

The computer program, *Decision-Maker*, is designed to analyse any voters' profile, no matter how many voters are involved (although the software is probably limited to just a few hundreds of voters), and subject only to a maximum of 14 options. It may also be used in elections, but only as per the voting procedures named, and not according to any system of PR, (proportional representation).

Now in real life, if voters know which voting procedure is to be employed, they may vary their preferences. This program therefore works on the premise that the preferences they express are their sincere ones, and it means that there are a few limitations. In approval voting, for example, all preferences cast on this program are counted as 'approvals'; and in serial voting, the order of voting is taken from the two 'extremes' of the order in which the options are first entered.

When the number of voters is small, there is always the possibility - (in the first stage of two-round voting, or in the earlier stages of AV/STV and serial voting) - that two or more options may tie when only one option has to be eliminated. If this happens, the option which comes first alphabetically (A...N) is accepted, and this will be indicated by an asterisk in the appropriate column on the 'results' page.

SYSTEM REQUIREMENTS

Decision-Maker was prepared and tested under the Microsoft Windows XP operating system, using the Java™ 2 Platform Standard Edition software. The program has also been tested, to a lesser extent, under the Gentoo distribution of the Linux operating system running the K Desktop Environment. The Java software is available for a variety of operating systems, so *Decision-Maker* should also run on Windows Vista, Windows 2000, Windows ME, Windows 98, Windows 95, MacOS, and the range of Linux distributions. Indeed, it should run on any operating system using a graphical desktop environment for which a recent implementation of the Java software is available. However, please note that while *Decision-Maker* may work under this wider range of operating systems, it is provided 'as is'. Support cannot be guaranteed on non-Windows platforms. The installation instructions below have been written specifically for use under Windows XP, and may require adaptation for other operating systems.

INSTALLING THE CD

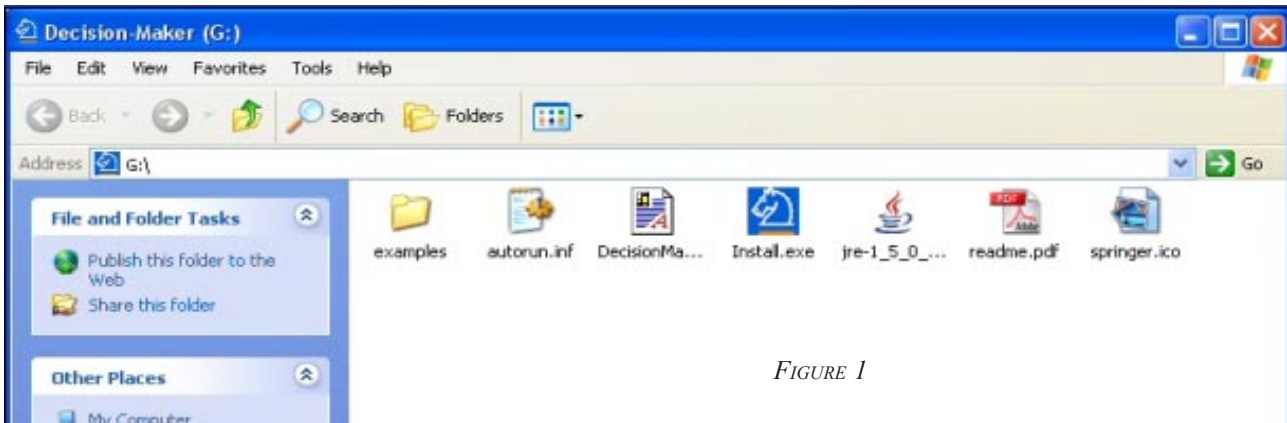


FIGURE 1

Step 1

Insert the *Decision-Maker* CD-Rom in your CD or DVD drive. The list of folders and files you will initially see on the CD-Rom should be as shown in figure 1. (Some of the files may have extensions after their names, such as .exe or .jar. This is to do with the way your system is set up, and will not affect *Decision-Maker*.)”

examples
 autorun.inf
 DecisionMaker.jar
 Install.exe
 jre-1_5_0_09-windows-i586-p.exe
 readme.pdf
 springer.ico

Step 2

Decision-Maker requires a recent version of the Java™ 2 Platform Standard Edition Runtime Environment. If your system does not already have a recent version of this software installed, you should install an up-to-date version of the Java software.



FIGURE 2

To do so, double-click the jre-1_5_0_09-windows-i586-p icon (as in figure 2) using your left mouse button and follow the on-screen instructions. Having run this file, the Java software should be successfully installed and you can proceed to Step 3. (If you are not using Windows, you can download a version of the Java Runtime Environment suitable for your operating system from the <http://java.sun.com> website.)

The minimum requirements for your computer for running this “Java Runtime Environment”, by the way, are a Pentium 166 mhz and 32 mb of RAM.

Step 3

Once you have an appropriate version of the Java software installed on your system (Step 2), you can either run *Decision-Maker* directly from the CD-Rom or you can install it onto your system. The first of these options is explored in Step 4. Skip Step 4 and go straight to Step 5 if you want to install *Decision-Maker* on your system.

Step 4

If you want to run *Decision-Maker* directly from the CD-Rom and you are using Windows, double-click (using the left mouse button) the file named *DecisionMaker* or *DecisionMaker.jar* as it is sometimes called. (How the file appears will depend on how your system is set up.)

Step 5

If you want to install *Decision-Maker* onto your system so that you will not need to insert the CD-Rom each time you want to run it, double-click your left mouse button on the file named ‘Install’ or ‘Install.exe’. Once you have done so, a window will appear on-screen prompting you to specify where on your system you would like *Decision-Maker* to be installed. Enter your preferred install location in the box underneath the text “Unzip to folder:” and click the ‘Unzip’ button. For example, if you want to install to the C:\Decision Maker folder, type this location (or use the Browse button to select it) and click ‘Unzip’. Once the installation is complete, you can run *Decision-Maker* by navigating to the folder in which it has been installed and double clicking on the file named ‘DecisionMaker’ or ‘DecisionMaker.jar’. If you want easy access to *Decision-Maker* you can create a shortcut to it by right-clicking on this file and selecting ‘Create Shortcut’. You can move this shortcut to a convenient location such as your Windows desktop or Start menu, from where you will be able to run the program in future.

Step 6

That is it. Close all the other windows, and double click on your new ‘DecisionMaker’ icon. You will find it among all your other icons, shown encircled (in figure 3 overleaf) in the sixth column. When you double click on the icon, you will automatically get the “Setup” picture shown in figure 4.

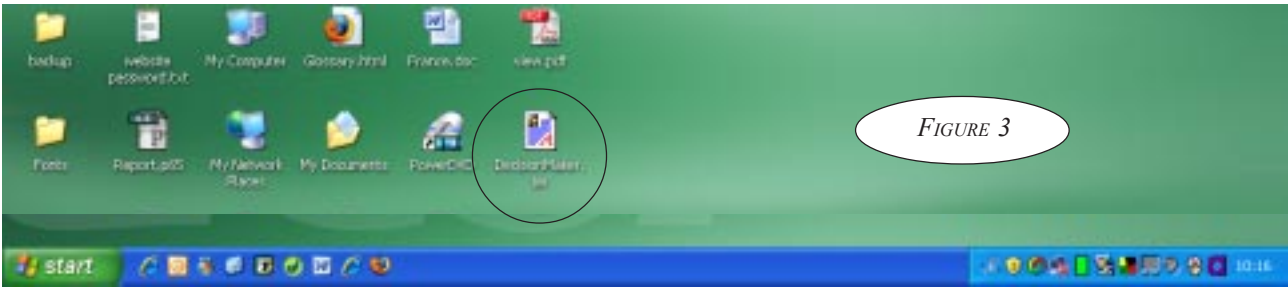


FIGURE 3

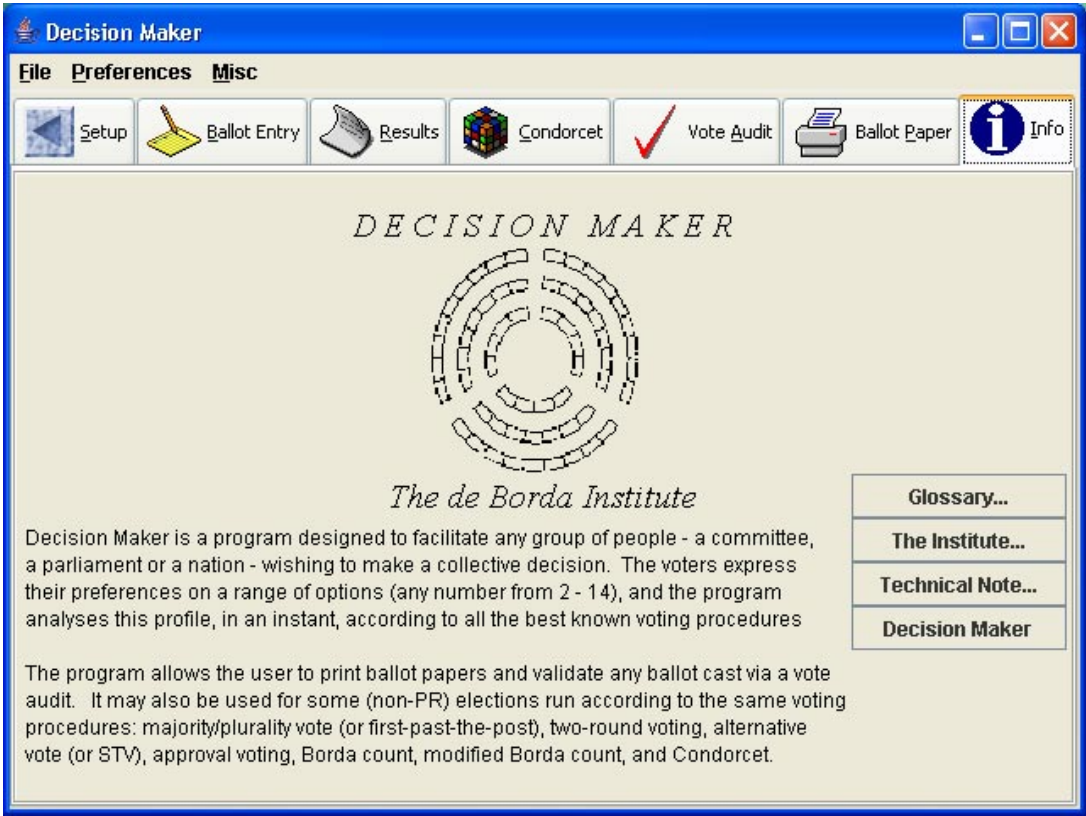
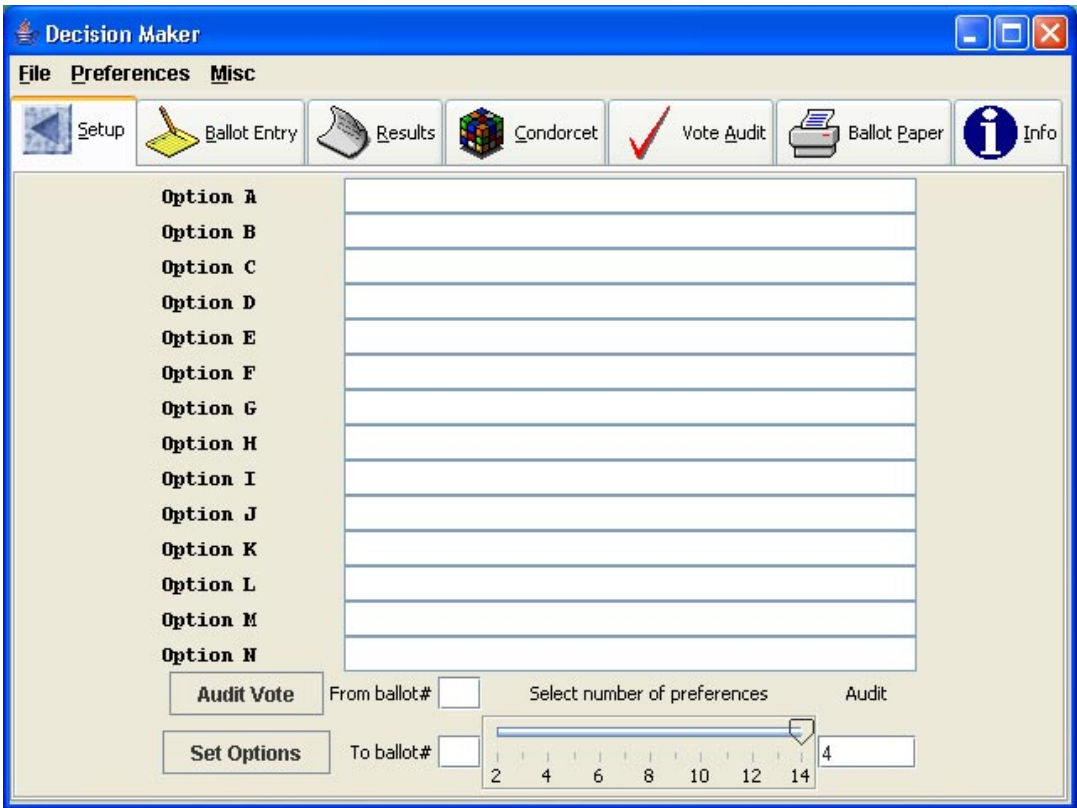


FIGURE 4

FIGURE 5



PROGRAM DESCRIPTION

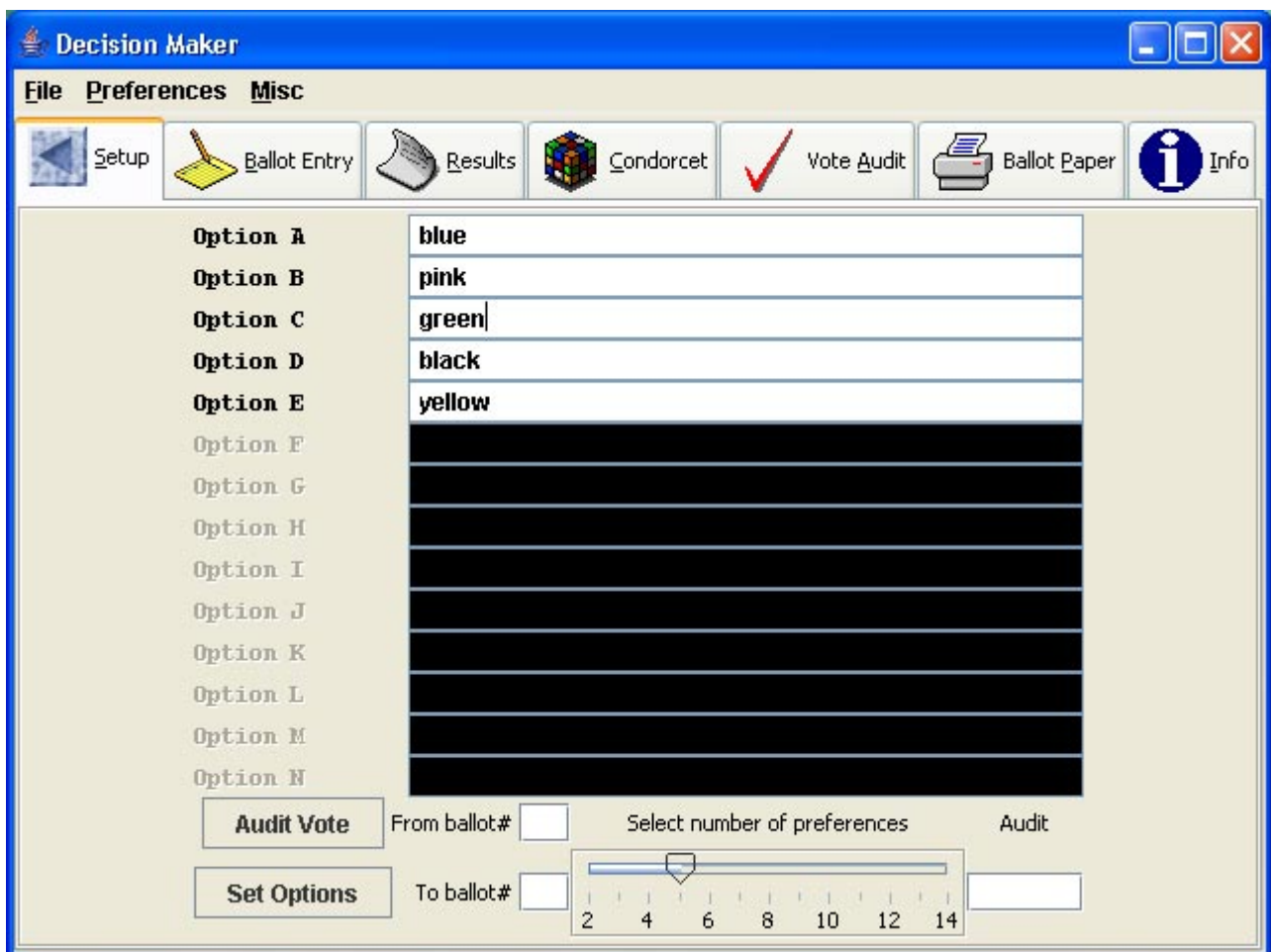
Now on some systems, you may need to resize *Decision-Maker* so that all of its contents are displayed. You can do this by holding down your left mouse button on an edge window and ‘dragging’ until the window has reached the size you desire.

On opening the program, you will get the picture shown in figure 4. Via a data projector and computer screen, this can be used to facilitate a debate which, let us assume, concerns the colour of your committee’s office door. As each new idea is aired, it may be entered onto the screen. Then, as directed by the (chairperson of the) debate, certain options may be amended; others may be added; but only if literally everyone is agreed, some options may be deleted.

At the end of the debate, maybe there is only one option left on the screen, in which case it may be assumed that this is the participants’ collective *verbal* consensus. When, however, a plural number of options remains, it is perhaps advisable to move to a vote.

Let us assume there are five options - ‘blue’, ‘pink’, ‘green’, ‘black’ and ‘yellow’ - which you may type in the spaces provided; there is a maximum of 50 characters for the description of each option. Next you go to the sliding scale at the bottom of the picture, and move it to “5”. Then you click on the ‘set options’ button, to produce figure 6. You are now ready for a vote on these five options to see which of the five is the committee’s most popular door colour.

FIGURE 6



THE BALLOT PAPER

You may now click on the ‘ballot paper’ button on the top of the ‘set up’ page and sure enough, you get a ballot paper with the five options as requested; (figure 7, overleaf).

By going to the ‘file’ button and clicking on ‘print ballot’, you will get as many copies of the ballot paper as are needed.

If numbered ballot papers are required, with numbers, say, from 1 to 50, return to the ‘set up’ button (figure 6, above) and type in the number “1” in the ‘From ballot#’ box along with the number 50 in the ‘To ballot#’ box. You may then proceed as above. There is no limit to the quantity of numbered ballot papers you may print.

THE VOTE

Participants may now vote, putting a 1 opposite their 1st preference, a 2 opposite their 2nd favourite, a 3 opposite their 3rd choice, and so on, as they wish, up to a maximum of all five options.

In order to be valid, a vote must contain at least a 1st preference.

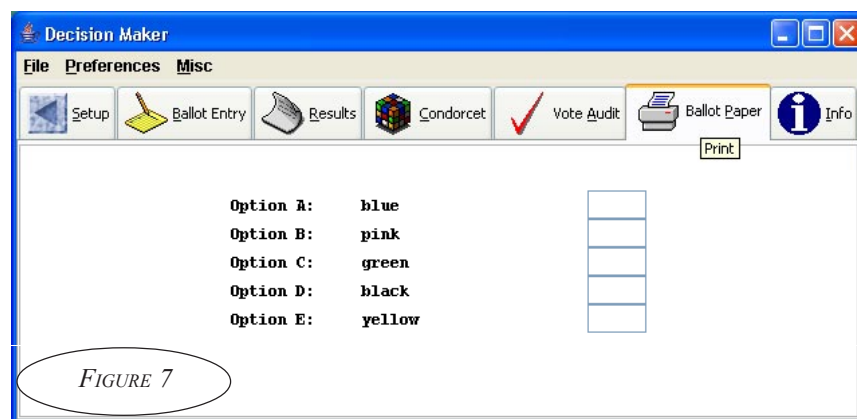


FIGURE 7

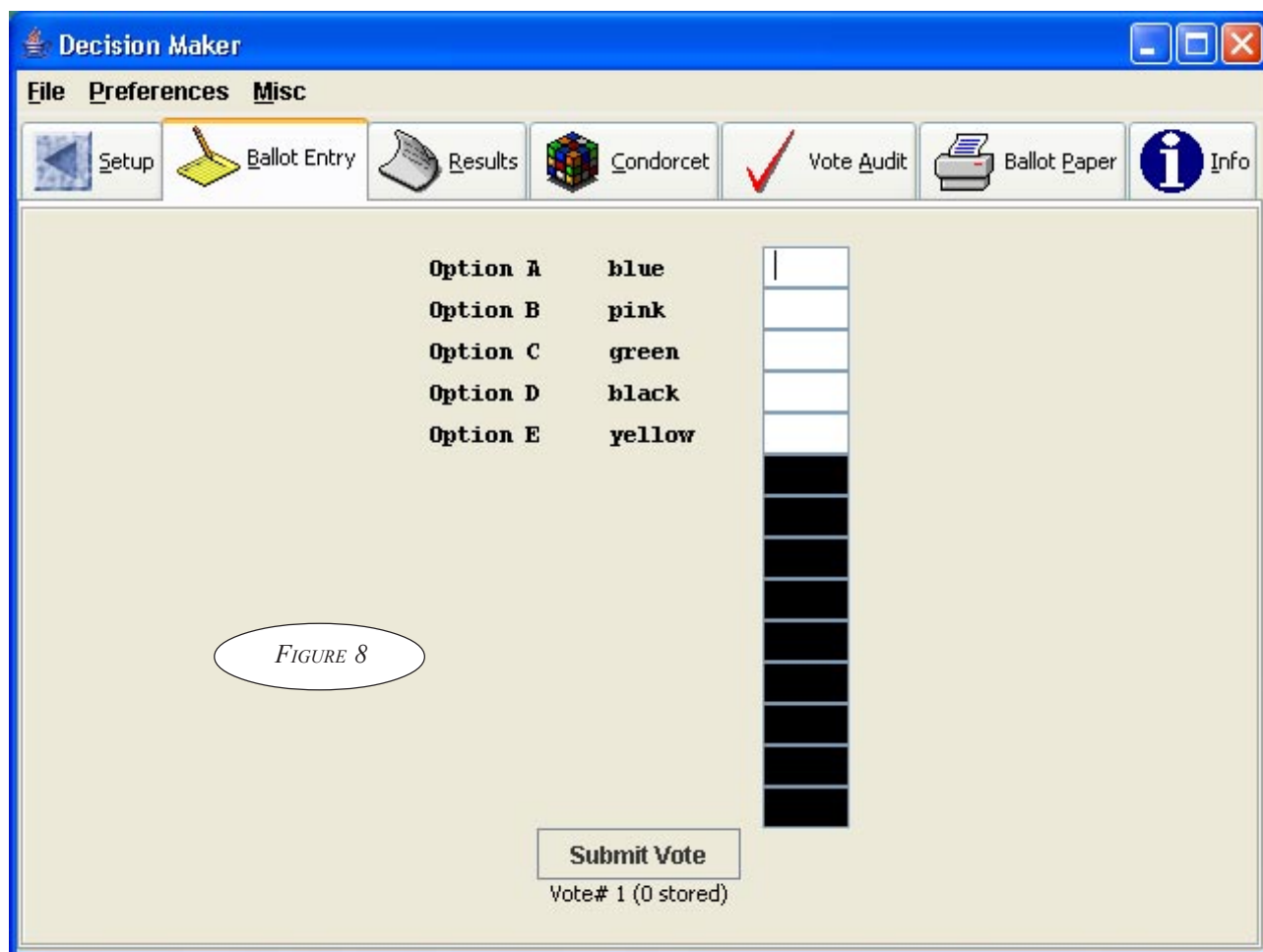


FIGURE 8

ENTERING THE VOTES

When everyone has voted, you may enter the votes into the computer. To do this, you click the 'ballot entry' button - figure 8 - and then, for the first vote, you click the cursor into the 'option A' square.

Imagine the first voter, whom we shall call Mr. *i*, voted with the following preferences:

Option	<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	<i>E</i>
Preference	4	1	2	3	5

FIGURE 9

In this instance, you type "4-tab-1-tab-2-tab-3-tab-5". If you are happy with what you have written, you then click on the 'submit vote' button whereupon a new blank page will appear, like the one in figure 8, except for the fact that the 'Vote#' sign will now be showing the phrase "2 (1 stored)".

You must check, by the way, before pressing the 'submit vote' button, that you have entered the vote correctly. When all (or even only some) of the votes have been entered, you can go to 'results'; if, however, either the tellers and/or the voter wish to check a vote, you may use the 'vote audit' button. But first, what is a valid vote?

VALID AND PARTIAL VOTES

The program will read the ballot as entered; if, therefore, a ballot is entered incorrectly, it will still be read; if a ballot is completely invalid, it will be read as invalid and not counted; if only some of the preferences are invalid, the vote may be treated as a valid partial vote, and those preferences which are valid will be counted.

So if Mr. *i* wants to vote 4 1 2 3 5 then, of course, he may. And if Ms. *j* wants to vote 1 5 2 3 4 she may too. Both votes are valid.

If, however, Mr. *k* votes 4 1 2 1 3, voting 1 twice, then that will be regarded as invalid. Obviously, a voter cannot have two 1st preferences.

Similarly, if Ms. *l* votes 4 1 3 2 3, this will be regarded as a partially valid vote. Her 1st and 2nd preferences are clear, but we do not know what her 3rd preference is. In this instance, the program will treat only her 1st and 2nd preferences as valid.

In some instances, voters may prefer to submit only a partial vote, and this they may do. If Mr. *m* wants to vote - - - 1 with just a 1st for option *E*, he may. If Ms. *n* votes 1 - 2 - - for options *A* and *C* respectively, and if Mr. *p* votes 2 1 - - 3, then these votes are acceptable too.

Some voting systems like plurality voting take only the 1st preferences into account, in which case a partial vote is just as effective as a complete vote. In other voting systems like MBC and Condorcet, a partial vote has only a corresponding partial effect.

THE VOTE AUDIT

There will almost certainly be those occasions when either a particular voter and/or the tellers may wish to check his/her vote. In these circumstances, it is useful to have the ballots numbered (page *vii*).

The program will accept any vote, whether it is valid or invalid. If it is valid, like Mr. *i*'s and Ms. *j*'s, then, when the program calculates the results, all of the vote will be taken into account. If it is a valid partial vote, like those of Messrs. *l*, *m*, *n* and *p*, it too will be used in so far as it can. If, however, it is invalid, like Mr. *k*'s, it will be recorded but it will not be used at all.

Any individual vote, however, can be corrected or validated (see below). If and when it has been so validated, the program will take the new valid vote into account. One must be prepared, therefore, when changing any one particular vote from an invalid vote to a valid vote, for the program to change some if not all of the results.

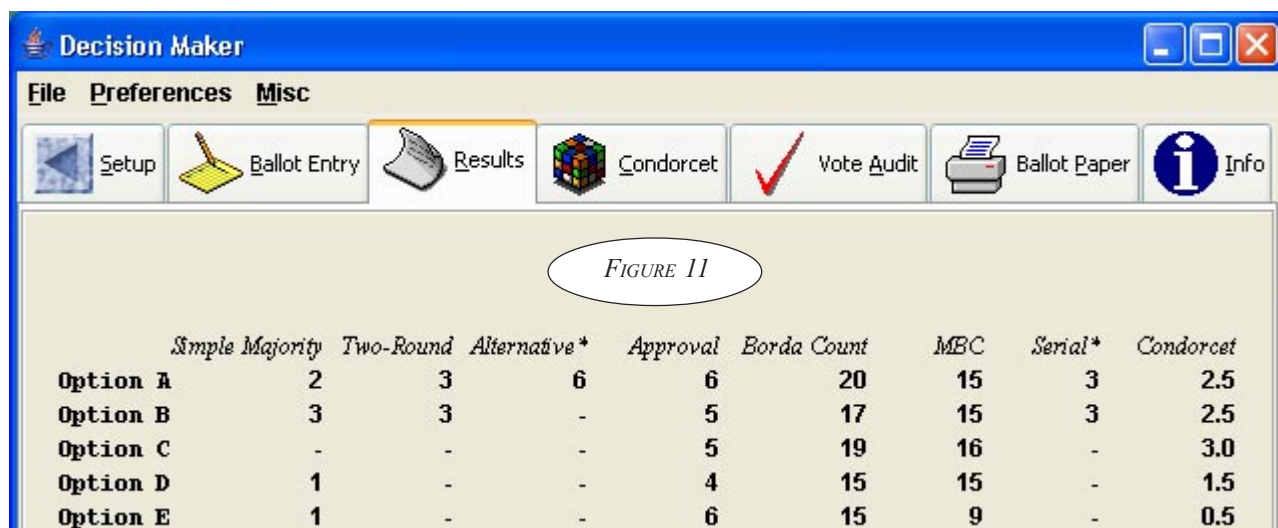


Now Ms. *l*, you remember, was the fourth person to vote - Messrs. *i*, *j* and *k* were the first three - and she (Ms. *l*) voted 4 1 3 2 3. If you go to the 'set up' button - figure 6, page *vii* - you will be able to initiate a vote audit.

Firstly, you type Ms. *l*'s ballot number, the number 4, into the 'audit' box at the bottom right hand corner. Then you click on the 'audit vote' button on the left, and finally you go to the 'vote audit' button at the top of the page, when you get the above figure 10.

As noted, Ms. *l* voted 4 1 3 2 3 and, because of the two 3s, only her 1st and 2nd preferences are valid. Hence the second column of figure 10. If she wants to change her vote (and if the tellers allow such a procedure), you may click the 'ballot entry' button (with the 'audit' box still reading 4) and change her vote to read 4 1 3 2 5 which, of course, is a valid full vote.

Having changed the vote, you then 'submit vote' in the normal way. And if you wish, you can now return to the vote audit, in which case you will see both the 'original' and the 'validated' columns showing the same data: 4 1 3 2 5. In similar fashion, Mr. *k*'s 4 1 2 1 3 can be changed to his intended 4 5 2 1 3. Before proceeding with any more votes, you should return to the 'set up' page - figure 6, page *vii* - and delete the number "4" from the 'audit' box.



THE RESULTS

In all, let us assume the following seven votes, as shown in figure 12, have now been submitted:

Figure 11 will appear when you click on the ‘results’ button: a table of five rows, one for each of the options, and eight columns, one for each of eight different voting procedures. Suffice to say that, if you use different counting procedures, you may well get different answers. In this example, a simple majority vote (or rather, a plurality vote) gives option **B**, which is the colour pink. Two-round and serial voting give a draw, options **A/B**, blue/pink. Approval voting gives another draw, options **A/E**, blue/yellow. Both AV and BC count give option **A**, blue. The MBC and Condorcet give option **C**, green. And all of these answers are democratic and so all of the options, in theory, are the committee’s most popular colour!

	Mr. <i>i</i>	Ms. <i>j</i>	Mr. <i>k</i>	Ms. <i>l</i>	Mr. <i>m</i>	Ms. <i>n</i>	Mr. <i>p</i>
Option <i>A</i>	4	1	4	4	-	1	2
Option <i>B</i>	1	5	5	1	-	-	1
Option <i>C</i>	2	2	2	3	-	2	-
Option <i>D</i>	3	3	1	2	-	-	-
Option <i>E</i>	5	4	3	5	1	-	3

FIGURE 12

The results of any number of votes may be viewed at any stage, by clicking on the ‘results’ button. The ‘results’ page will always count all the votes thus far entered.

SIMULTANEOUS PROGRAMS

Computer memory permitting, you can have several copies of *Decision-Maker* open and running at the same time. This could be useful if, for example, you want to compare and contrast the outcomes of two or more different contests. Just start the program in the normal way once, and then again for each additional copy you want to be opened. Each copy of the program will run independently of the other, so you can conduct one contest in one running *Decision-Maker*, and a separate context in another. If you have more than one *Decision-Maker* open at the same time, you may find it helpful to make a clear distinction between the two (or more) by changing the colour scheme associated with each. This can be done by using the various options on the ‘preferences’ menu.

EXAMPLES

To see the examples in *Decision-Maker*, navigate into the folder named ‘examples’ and select one of the files. The ‘examples’ folder is on the CD-Rom (see Figure 1) and it is also automatically installed alongside *Decision-Maker* if you choose to install the program on your system; in this case ‘examples’ will be a sub-folder of the folder in which *Decision-Maker* has been installed, for example C:\Decision-Maker). For more on opening saved files, see page xii.”

One example is taken from this ‘readme’ document and it shows the “results” given in Figure 11. The other two are from Appendix I of *Designing an All-Inclusive Democracy*. The example entitled “full” is based on the voters’ profile on page 150 in which all ten voters submitted full ballots, and it shows the “results” from Table App I.K on page 154. The second is called “partial”; it is based on the profile on page 155 and it shows the outcomes in Table App. I.P on page 157. Please note the difference in the approval vote outcomes: in the book, they are calculated from the voters’ first two preferences only, whereas *Decision-Maker* works on the basis that every preference cast is, *ipso facto*, an ‘approval’. Please also note, as explained on page iv, that *Decision-Maker* will show an asterisk if during the course of a count, a tie has occurred; in the book, options **B** and **E** tie in both the full and partial ballots analyses of the AV/STV count, while **B** and **D** tie in the serial vote analysis of the full ballot.

ELECTORAL SYSTEMS

Some decision-making voting procedures may be used as electoral systems as well, and this program can also be used in this second mode. Now needless to say, in decision-making, there can usually be only one final decision. In some electoral systems, however, in those which are classified as PR systems, there are invariably two or more winners. This program can be used (with non-PR systems only) by typing in the name of the candidates under the various option headings, and proceeding as you would in a decision-making process.

First-past-the-post, FPP, (as used in Britain) This is a plurality vote and can be used with this program under the “Majority Voting” column.

Two-round Voting (France) A two-round election uses the same procedure as a two-round decision, although in some French presidential elections, the second round may be between the top *three* candidates.

Alternative Vote, AV, (Australia) Otherwise known as the single transferable vote, STV, or in the **USA** as instant run-off voting, IRV, this procedure can also be used in its PR mode, as is the case in **Ireland**, but not of course on this program.

Approval Voting (United Nations) The UN sometimes uses this methodology but, as far as is known, no national parliament has yet adopted it.

BC (Nauru and Kiribati) The procedures adopted in **Nauru** are a slight variation on those normally associated with the Borda count. Those in **Kiribati** are standard.

MBC and Condorcet The MBC has yet to be adopted by any national parliament. A Condorcet count *can* be used as an electoral system but, (unless a computer program is used), the counting procedure can be very protracted.

EXIT

To end the program, click on the ‘file’ button and then on “exit”. This will return you to figure 4 (page *vi*), and this you can close in the normal way by hitting the “x” box on the top right hand corner. This will return you to your desktop, figure 3 (page *vi*).

UNINSTALLATION

To remove *Decision-Maker* from your system, locate the folder in which it is installed, select *Decision-Maker* with your left mouse and either press the ‘delete’ key on your keyboard or right-click with your mouse and, on the menu that appears, select the ‘delete’ option. Your system may ask you to confirm the deletion. Do so if you wish to proceed.

SOLUTIONS TO TYPICAL PROBLEMS

Using Decision-Maker

Experience suggests it is advisable for two computer operators to feed in the votes. One person reads out the ballot; the other types in this information; and both check the correctness of the operation. With a 10-option ballot, the process can proceed at about 5 ballots per minute.

Small Number of Voters

As noted in “System Requirements” on page *iv*, when the total number of voters is quite small, there is always the possibility of a draw during one of the preliminary stages of any system involving two or more stages - voting procedures such as AV (or STV), serial voting and two-round voting. In these scenarios, the program then chooses the option which is the foremost alphabetically, and such a situation will be shown by an asterisk in the relevant column on the ‘results’ page. If this does happen, the user is advised to conduct a paper count as well.

Audit

On initiating a vote audit, the user must remember to click both the ‘audit vote’ button and the ‘vote audit’ button on the left-hand side and the top of the ‘set-up’ page, respectively. On completing a vote audit, the box in the right hand side of the ‘set-up’ page should be cleared.

There is as yet no provision on the program for a full vote audit, i.e., an anonymous tally of all the preferences cast by all of the voters.

Spread Sheets

It is not yet possible to analyse information contained on a spread sheet, except by feeding in this information as if it consisted of individual votes. The de Borda Institute intends to develop the program to include this provision.

STORING AND RETRIEVING DATA

To remove all the information associated with a particular vote, go to the ‘file’ button and click on “new”. You may now proceed to a completely new vote. If, however, you wish to save a particular vote, in its entirety, go to the ‘file’ button and click on ‘save as’. You may then give that particular vote a name and a folder, just as you would when saving a document. The colour scheme associated with the results you are saving (see ‘Simultaneous Programs’ on page *x*) will be stored along with the results. You can also open up votes you have previously saved (and restore the associated colour scheme) by going to the ‘file’ menu and selecting ‘open’, and then selecting or typing the name and location of the file you want.

HELPDESK CONTACT

If you have difficulties with installing the program, or if you have any criticisms or comments on its application, please contact either the designer Dr. Alan Scott, and/or the director of the de Borda Institute, Peter Emerson.

alan.scott@dnet.co.uk or pemerson@deborda.org

The de Borda Institute
36 Ballysillan Road
Belfast BT14 7QQ
N Ireland

00 44 (0)28 90711795

www.deborda.org

INDEX		
A	E	M
audit, see vote audit	electoral systems <i>iv, xi</i>	MACos <i>iv</i>
Australia <i>xi</i>	FPP <i>xi</i>	N
B	IRV <i>xi</i>	Nauru <i>xi</i>
ballot paper <i>vii</i>	STV <i>xi</i>	P
Britain <i>xi</i>	electronic voting <i>iv</i>	partial votes <i>ix</i>
C	examples <i>v, x</i>	PR <i>iv, xi</i>
computer requirements <i>v, x, xi</i>	‘exit’ <i>xi</i>	preferendum <i>iv</i>
consensus, verbal <i>vii</i>	F	profile, see voters’
D	France <i>xi</i>	R
de Borda Institute <i>xi, xii</i>	G	re-sizing the window <i>vii</i>
<i>Decision-Maker</i> , limitations	Gentoo Distribution <i>iv</i>	S
number of options <i>iv</i>	H	‘save as’ <i>xii</i>
number of voters <i>iv, xi</i>	helpdesk <i>iii, xii</i>	sincere voting <i>iv</i>
number of programs <i>x</i>	I	U
decision-making systems <i>iv, xi</i>	invalid, see valid	UN <i>xi</i>
AV <i>iv, x, xi</i>	Ireland <i>xi</i>	USA <i>xi</i>
approval voting <i>iv, x, xi</i>	J	V
BC <i>x, xi</i>	Java <i>iv, v</i>	valid votes <i>viii, ix</i>
Condorcet <i>iv, ix, x, xi</i>	K	vote audit <i>viii, ix, xi</i>
majority vote <i>iv, x, xi</i>	K Desktop Environment <i>iv</i>	voters’ profile <i>iv, x</i>
MBC <i>iv, ix, x, xi</i>	Kiribati <i>xi</i>	voting <i>vii, viii</i>
plurality vote <i>iv, ix, x, xi</i>	L	W
serial voting <i>iv, x</i>	Linux <i>iv</i>	Windows XP <i>iv</i>
STV, see AV		
two-round voting <i>iv, x, xi</i>		
<i>Designing an All-Inclusive Democracy x</i>		

ABBREVIATIONS

AGM	annual general meeting	AV	alternative vote
BC	Borda count	FPP	first-past-the-post
IRV	instant run-off	MBC	modified Borda count
NGO	non-governmental organisation	PR	proportional representation
STV	single transferable vote	UN	United Nations
USA	United States of America		