

BOWRAP BOWLING LEAGUE FIXTURE GENERATION

Version 2.1

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Contents

Introduction.....	2
Basic principles.....	2
Planning a season.....	2
Things to bear in mind.....	3
Choose patterns.....	4
How a pattern is laid out.....	4
Mechanics.....	5
Specify patterns and dates.....	5
Fill in composition.....	5
Generate fixtures.....	5
Teams playing on different days.....	5
Clubs playing in other leagues.....	6
Special patterns.....	7
Importing and exporting settings.....	7
Export settings.....	7
Import settings.....	7
Generating league data files.....	8
Technical notes.....	8
Protection.....	8
New patterns.....	8

Introduction

The file Bowrap-Fixtures.xls is an Excel (2007) spreadsheet for generating fixtures. It contains macros, so you will usually get a warning when you open it and you will have to click on the “Enable macros” button. It is designed for leagues of eight to 16 teams, where each team plays all the others twice – home and away.

It was developed by Ross Kavanagh, using presentation styles and many patterns developed by David Sanderson.

Basic principles

The spreadsheet works by using a set of “fixture patterns.” These list all the fixtures for a season, with the teams represented by A, B, C, ... The real fixtures are generated by substituting actual team letters for these letters. The patterns are all arranged so that teams A and B are never both at home, and likewise for the pairs CD, EF, ... So if two teams share a green, they should be allocated to one of these pairs. This works even if the two teams are in different divisions. Some patterns “fit” together, and then the pairs work across the two patterns.

The idea of using patterns is ancient, but the particular presentation of them here is due to David Sanderson. It makes it easy to visualise a pattern and see how teams will have runs of home or away matches. See <http://www.bowls.org/offcuts/fixtpats.html>.

Planning a season

You must first decide how many divisions to have, and how many teams in each division. Then you can allocate the teams to the divisions. Normally this is based on the previous year with promotion and relegation as required. Often there are also new teams or resignations to cope with.

If you have an odd number of teams in a division, round it up to an even number by adding a dummy team “Open date.”

For n teams the season consists of $2n - 2$ fixture cycles:

No of teams	Fixture cycles
8	14
10	18
12	22
14	26
16	30

If you have divisions of different sizes, the middle cycles have to share the same dates. For example, with divisions of 10 and 12 (and playing one cycle of matches per week), the 10-team division starts two weeks after the 12-team division, and finishes two weeks earlier.

Work out which teams are sharing greens. These will have to be allocated “paired” letters. If you have more than two teams using one green, then the usual solution is for the third and fourth teams to play their matches on a different day from the rest of the league. This creates an extra “green.”

Things to bear in mind

Davis Sanderson provided the following notes.

- Which green does each team play on?
Ideally, make up a sheet listing each green used and which team(s) play on it. Teams playing the same green at the same time need to be placed in opposing slots of the schedule, e.g. A and B, C and D etc.
- Is there a team from another league sharing a green with a team from this league?
If the two leagues use the same fixture pattern, start and end at the same time, and cup weeks if any are the same, then there should be no problem if the teams concerned play opposite each other.
- Are there different teams playing on the same set of municipal greens?
The Council may insist that an adjacent green be left free for the public. In this situation, teams from different clubs need to be scheduled opposite each other.
- Do any of the clubs or teams have any special needs?
If a club needs to keep their green free on a particular date for a competition or visiting party, this is just a matter of picking a slot where the team plays away in that week.
- Are there two teams from the same club in the same division?
Try to arrange it, by using an appropriate pair of slots, that they play each other at least two weeks before the end of the season to avoid moans from other clubs re “fixing.”
- Is there an odd number of teams in a division?
In this case, try to use a fixture pattern where there is no same-team back to back reverse fixture in the middle of the season. This will avoid two consecutive blank weeks for one of the teams.
- Do most of the clubs in a division have other teams in lower divisions?
If the lower division has less teams, then clubs without other teams in the lower division may need to be pre-selected into slots which don’t occur in the lower division.
e.g. A 12 team division and a 10 team division. Ten of the 12 clubs have a second team in the lower 10 team division. The two solo teams will need to be scheduled in slots K and L of the 12 team pattern.

Choose patterns

You can now choose the patterns to use (of course this may be decided by long tradition!). If you have divisions of different sizes, you must choose patterns which fit together. If all the divisions are the same size you have a free choice of all the appropriately sized patterns, so things are much easier.

If you have clubs sharing greens with teams in other leagues, read the section “Clubs playing in other leagues”.

The patterns are in worksheet “Patterns.”

How a pattern is laid out

The matches, week by week
(here, 14 weeks of 4 matches)

Pattern name

The matches where a “pair”
play for the second time
are highlighted

08aaaa														
AD	BC	AG	BA	AE	BD	BG	DA	CB	GA	AB	EA	DB	GB	
CG	DH	CE	DC	DG	CA	DE	GC	HD	EC	CD	GD	AC	ED	
EB	FA	FD	EF	FB	EH	FC	BE	AF	DF	FE	BF	HE	CF	
HF	GE	HB	GH	HC	GF	HA	FH	EG	BH	HG	CH	FG	AH	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	
RFx							1	2	3	4	5	6	7	
o	x	o	x	o	x--	--x--	--x	o	x	o	x	o--	--o	A
x	o	x	o	x	o--	--o--	--o	x	o	x	o	x--	--x	B
o	x	o	x--	--x	o	x--	--x	o	x	o--	--o	x	o	C
x	o	x	o--	--o	x	o--	--o	x	o	x--	--x	o	x	D
o	x--	--x	o	x	o	x--	--x	o--	--o	x	o	x	o	E
x	o--	--o	x	o	x	o--	--o	x--	--x	o	x	o	x	F
x	o	x	o	x	o	x	o	x	o	x	o	x	o	G
o	x	o	x	o	x	o	x	o	x	o	x	o	x	H
Fit:	10acaa													

Week (or cycle) numbers

Shows the “reverse fixtures”

Pattern that fits with this one

Shows for each week if a team is at home (o) or away (x). Highlights runs of home or away matches.

Mechanics

You should have collected together the following information.

- Chosen pattern(s)
- Teams in each division, with allocated letters
- Dates for each fixture cycle

You are now ready to put this information into the spreadsheet and generate the fixtures.

Specify patterns and dates

This information is entered in the worksheet “Dates-Patterns”. You need to provide data for each relevant division size in your league.

The pattern name goes in the yellow box at the top of the division size. Then enter the date for each fixture cycle in the outlined box below. Typically these will be successive weeks, but you might want to skip certain weeks to leave free dates for things like a knockout cup or merit. You don’t have to have the dates in chronological order: swopping a couple of dates here has the same effect as swopping the weeks in the fixture pattern. But if you do this you will probably create longish runs of successive home or away matches.

The layout of the dates emphasises how the schedules for a smaller division normally fits within a larger division. The corresponding dates are all on the same line. So if you have differently-sized divisions, you need to ensure you have only one date on each line.

Fill in composition

Enter the team names for each division in the upper outlined box on sheet “Composition.”

If you want to give your divisions special names, enter them in cells B37 to B43. The shorter names, in cells C37 to C43 are used if you generate a file for Bowrap-League.

Generate fixtures

Click on the “Generate fixtures (Excel)” button. A new workbook is opened with a worksheet for each division and the fixtures in chronological order.

The “Generate fixtures (Word)” button produces the fixtures in a *rich text format (rtf)* file which is compatible with Word and other word processors. You will be prompted for a file name and location, where the resultant file is stored. The fixtures are organised by weeks, with all divisions shown together on a page.

Teams playing on different days

Take the example of a league that plays most of its matches on Thursdays. The Red Lion club has three teams (and one green), so Red Lion C will play its home matches

on Tuesdays. On the “Composition” worksheet, enter an offset of -2 (i.e. 2 days earlier) in the lower outlined box at the position corresponding to Red Lion C. The adjusted dates will now appear on the “Divisions of xx” page. Of course the fixtures are no longer in order, but “Copy fixtures” will fix this.

Actually the adjustment is calculated by multiplying the team offset in “Composition” by the week offset in “Dates-Patterns”. Suppose the league plays on Mondays, or on Tuesday when the Monday is a bank holiday. Red Lion C always plays on Wednesday. You would list the Monday/Tuesday dates in “Dates-Patterns” and set the offsets on this page to 2 for Mondays and 1 for Tuesdays. On the “Composition” page, set Red Lion C’s offset to 1.

Clubs playing in other leagues

It can be difficult to organise teams which share their greens with teams in other leagues. The ideal is to arrange for both leagues to use the same dates and patterns (or patterns which fit).

If you have a team which already has a set of dates reserved for home matches in another league, use the “Other league dates” sheet. This shows the fixture dates you have set up, and allows you to mark the “unavailable” dates for up to three teams. Mark these dates with any symbol you like (leave the available dates blank).

8	10	12	14	16	Week no	Team 1
				Sun 1/1/1900	1	
				Sun 1/1/1900	2	
			Tue 6/4/2010	Sun 1/1/1900	3	
			Thu 8/4/2010	Sun 1/1/1900	4	
		Tue 13/4/2010	Tue 13/4/2010	Sun 1/1/1900	5	
		Tue 20/4/2010	Tue 20/4/2010	Sun 1/1/1900	6	
	Mon 16/4/2007	Tue 27/4/2010	Tue 27/4/2010	Sun 1/1/1900	7	
	Mon 23/4/2007	Tue 4/5/2010	Tue 4/5/2010	Sun 1/1/1900	8	
Tue 8/5/2007	Mon 30/4/2007	Tue 11/5/2010	Tue 11/5/2010	Sun 1/1/1900	9	o
Tue 15/5/2007	Mon 7/5/2007	Tue 18/5/2010	Tue 18/5/2010	Sun 1/1/1900	10	
Tue 29/5/2007	Mon 14/5/2007	Tue 25/5/2010	Tue 25/5/2010	Sun 1/1/1900	11	o
Tue 5/6/2007	Mon 21/5/2007	Tue 1/6/2010	Tue 1/6/2010	Sun 1/1/1900	12	o
Tue 12/6/2007	Mon 28/5/2007	Tue 8/6/2010	Tue 8/6/2010	Sun 1/1/1900	13	
Tue 26/6/2007	Mon 4/6/2007	Tue 15/6/2010	Tue 15/6/2010	Sun 1/1/1900	14	o
Tue 3/7/2007	Mon 11/6/2007	Tue 22/6/2010	Tue 22/6/2010	Sun 1/1/1900	15	
Tue 10/7/2007	Mon 18/6/2007	Tue 29/6/2010	Tue 29/6/2010	Sun 1/1/1900	16	o
Tue 17/7/2007	Mon 25/6/2007	Tue 6/7/2010	Tue 6/7/2010	Sun 1/1/1900	17	
Tue 24/7/2007	Mon 2/7/2007	Tue 13/7/2010	Tue 13/7/2010	Sun 1/1/1900	18	o
Tue 31/7/2007	Mon 9/7/2007	Tue 20/7/2010	Tue 20/7/2010	Sun 1/1/1900	19	
Tue 7/8/2007	Mon 16/7/2007	Tue 27/7/2010	Tue 27/7/2010	Sun 1/1/1900	20	
Tue 14/8/2007	Mon 23/7/2007	Tue 3/8/2010	Tue 3/8/2010	Sun 1/1/1900	21	o
Tue 21/8/2007	Mon 30/7/2007	Tue 10/8/2010	Tue 10/8/2010	Sun 1/1/1900	22	
	Mon 6/8/2007	Tue 17/8/2010	Tue 17/8/2010	Sun 1/1/1900	23	

Other league dates set for Team 1

When you have set any unavailable dates, a column appears to the right of every pattern, showing how many date clashes there are for each position in the pattern. You

can use this information to help in choosing a pattern and to select the best position for these problem teams in the chosen pattern.

08primx															
AH	GH	AD	EH	AG	CH	AC	AF	GE	AB	EC	AE	CA	BG		
CF	BE	CB	GC	CE	EA	DG	CD	BC	CG	GA	DB	EF	DE		
ED	DC	EG	BA	FB	GF	FE	EB	DA	FD	BF	FG	GD	FC		
GB	FA	HF	DF	HD	BD	HB	HG	FH	HE	DH	HC	BH	HA		
1	2	3	4	5	6	7	8	9	10	11	12	13	14		
RFx							2	3	4	5	6	7	1		
o	x	o	x	o	x	o--	--o	x	o	x	o	x--	--x	B	4
x	o	x	o	x	o	x--	--x	o	x	o	x	o--	--o	A	3
o	x	o	x	o--	--o	x	o	x	o	x--	--x	o	x	C	6
x	o	x	o	x--	--x	o	x	o	x	o--	--o	x	o	D	1
o	x	o--	--o	x	o	x	o	x--	--x	o	x	o	x	E	6
x	o	x--	--x	o	x	o	x	o--	--o	x	o	x	o	F	1
o--	--o	x	o	x	o	x--	--x	o	x	o	x	o	x	G	4
x--	--x	o	x	o	x	o--	--o	x	o	x	o	x	o	H	3

Number of clashes for each position. D and F are best.

Numbers of clashes shown for Team 1

Special patterns

If you need a pattern that is not already available then you can use a “Special Pattern” (there is one of these for each division size). This is easier to manage than adding new patterns to the main set. Store the pattern information in the appropriate place on the “Special Patterns” worksheet. The “Check fits” button can be used to validate the special patterns and also to find fits between them and other patterns.

Importing and exporting settings

You can save the data you have entered, and reload it later. This is useful if you are working on several leagues, and want to return to a work-in-progress.

Export settings

Click on the ‘export settings’ on the Composition worksheet. You are invited to specify a file name (ending in .ini), where the user data will be stored.

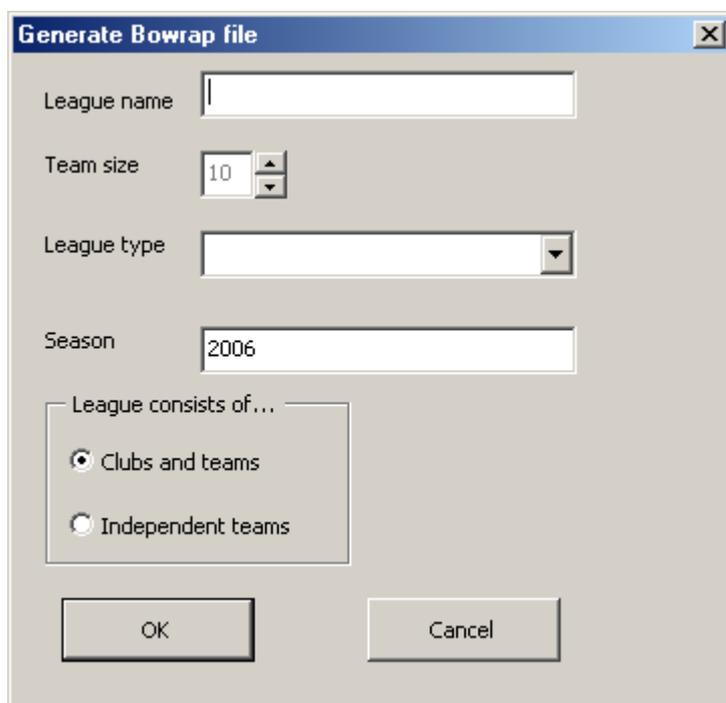
Import settings

Click on the ‘import settings’ on the Composition worksheet. This opens a standard file dialogue where you can select a file generated by ‘Export settings.’ This restores the league composition, patterns, division names, dates and any special patterns used. If special patterns are imported they are validated and checked for fits with other patterns. This takes some time to run.

Generating league data files

The Bowrap fixture processor can also be used to generate a data file for use with the Bowrap league management program.

To generate a file, click on the ‘Generate bwt file’ button on the Composition worksheet. This dialogue appears:



Technical notes

Information for advanced users wishing to modify the spreadsheet

Protection

The spreadsheet is protected to avoid unintentional changes. Only the cells that are expected to be modified are unlocked, and these have a pale yellow background.

New patterns

You can add new patterns on the “Patterns” page so long as you stick to these rules.

- The pattern name must start with the division size.
- The pattern name must be in column A, with the actual pattern starting two rows down.

However it is generally easier to use the Special Patterns feature.

If you select a pattern (this will be a shape n rows by $2n - 2$ columns) and run macro GenerateHomeAway, the block of o’s and x’s to show home and away matches will

be written below the pattern. This macro also makes sure the pattern is valid, and highlights where same-pair matches are played.

You can verify that two patterns “fit” using the macro FitValidator. Select a cell containing the name of one pattern, control-click on a cell containing the name of the other, and run the macro. You can also use the formula “=PatternsFit(Pattern1, Pattern2)”, where Pattern1 and Pattern2 are the names of patterns (or references to cells containing the names).

The macro MakeFitReports will clear and then regenerate all the “fitting” information under the patterns. If the “Patterns” sheet is protected (as it normally is), the reports are done only for the special patterns. Otherwise it reports on every pattern (and it takes some time to run).