MATRICES

The vast majority of leagues are run as 'round robin', in which each team plays each of the others twice, once at home and once away.

Creating a list of matches would be trivial if there was a long enough time frame but the best way is to have a series of weekly matches where each team plays a match. This allows the whole league to be played in a minimum number of weeks and maintains a running league position, which may stay close right up until the last week.

In order to do this, you must start with a matrix which ensures that each team only plays once each week and also plays all of the other teams.

Note: Although it is not necessarily described in this way, all fixture generators work in the same way, in that behind the scenes is a matrix and given a list of teams, it uses the matrix to generate the fixtures.

An example of a matrix for 6 teams begins as follows:

Week 1: Team 1 v Team 2, Team 3 v Team 4, Team 5 v Team 6
Week 2: Team 2 v Team 3, Team 4 v Team 5, Team 6 v Team 1
etc.

where the first named team is the home team.

However, it is common practice to use the letters A, B, C etc. to represent teams so a matrix will begin as follows:

Week 1: A v B, C v D, E v F
Week 2: B v C, D v E, F v A
etc.

Note: The matrix for the second half of a league is invariably the reverse of the first half. It is quite possible to use a completely different matrix for the two halves but reversing the first half is the only way to ensure that each team plays an equal number of home and away fixtures.

Mathematically there are many ways of creating a matrix for a given number of teams but not all of them work well. The criteria we are looking for in a matrix are:

1) *Each team should alternate home and away. No matrix can actually do this but some are better than others.*

2) *Each team should have the same number of home and away matches in each half. This can only be done with an odd number of teams but even with an even number of teams, the difference should be no more than one.*

3) *There should be natural opposites in the matrix. Often there will be clubs who can only accommodate home teams once a week and yet wish to run more than one team. The only way to do this is, for example, to have one team playing H(ome), A(way), H, A, H while the other team plays A, H, A, H, A and the more of these natural opposites the matrix has, the easier it is to accommodate these situations.*

Another point to remember is that with an even number of teams in a division, you can have each team playing a match every week. For instance a division of 4 teams will have the following first half fixtures:

Week 1: A v B, C v D
Week 2: D v A, B v C
Week 3: A v C, D v B

However, an odd number of teams in a division will result in a 'gap' week for each team:

Week 1: A v D, B v C (no E)
Week 2: C v A, D v E (no B)
Week 3: E v C, A v B (no D)
Week 4: B v E, C v D (no A)
Week 5: D v B, E v A (no C)

But move up to a 6 team matrix and every team plays each week again, although the number of periods does not increase.

Week 1: A v D, B v C, E v F
Week 2: C v A, D v E, F v B
Week 3: E v C, A v B, D v F
Week 4: B v E, C v D, F v A
Week 5: D v B, E v A, C v F

Note: The number of periods in any half is always an odd number, regardless of the number of teams. This means that in any half you can never have an equal number of home and away fixtures. (see previous note above).

Note: Because the number of periods of a matrix for an odd number of teams is exactly the same as a matrix for one more team, there is actually no such thing as a 5, 7, 9 etc. matrix; they are simply 6, 8 or 10 team matrices but with one team left out.

Assuming that your league **always** uses a fixed number of teams per division, that the number of teams per division is even and that having created the fixtures you **never** add another, then using a matrix such as the 6 team one above works fine.

However, leagues are never that easy and almost always a team drops out or you need to add an extra team in at the last minute.

A team dropping out is not really a problem as far as your fixtures are concerned but if you started with an even number and you then want to add a team, you have a real problem. As above, if you started with an odd number, then you already have a gap ready to use but with an even number you must use a completely different matrix with two extra periods.

One way round this is to always start with a matrix that has gaps. So if you normally have 8 teams per division, then use a 10 team matrix. Adding in another team is then easy.

In fact, having gaps is extremely useful. What if a fixture has to be rearranged for some reason? Without gaps in the shedule, it is often difficult to do.

Preferred Matrices

A series of preferred matrices are given below. These are not the only ones which fill the above criteria but if you are starting from scratch, they are good ones to use.

Note: County League Master have the following matrices in their system, so simply specify the 'standard' 6 8 or 10 team matrix when submitting your teams for a new league.).

6 Team Matrix

Week	Home team	Away Team
1	A	F
	B	E
	C	D
2	F	D
	E	C
	A	B
3	B	F
	C	A
	D	E
4	F	E
	A	D
	B	C
5	C	F
	D	B
	E	A

Home and Away for each team:

Team	*Week 1*	*Week 2*	*Week 3*	*Week 4*	*Week 5*
A	H	H	A	H	A
B	H	A	H	H	A
C	H	A	H	A	H
D	A	A	H	A	H
E	A	H	A	A	H
F	A	H	A	H	A

This works well for the following reasons:

1) Two of the teams exactly alternate home and away through any one half: teams C and F.

2) No team has more than two occasions over the whole league where they play two home or two away in a row.

3) There are three pairs of natural opposites: teams A and D, B and E and C and F.

8 Team Matrix

Week	Home team	Away Team
1	A	H
	B	G
	C	F
	D	E
2	H	E
	F	D
	G	C
	A	B
3	B	H
	C	A
	D	G
	E	F
4	H	F
	G	E
	A	D
	B	C
5	C	H
	D	B
	E	A
	F	G
6	H	G
	A	F
	B	E
	C	D
7	D	H
	E	C
	F	B
	G	A

Home and Away for each team:

Team	*Week 1*	*Week 2*	*Week 3*	*Week 4*	*Week 5*	*Week 6*	*Week 7*
A	H	H	A	H	A	H	A
B	H	A	H	H	A	H	A
C	H	A	H	A	H	H	A
D	H	A	H	A	H	A	H
E	A	A	H	A	H	A	H
F	A	H	A	A	H	A	H
G	A	H	A	H	A	A	H
H	A	H	A	H	A	H	A

This works well for the following reasons:

1) Two of the teams exactly alternate home and away through any one half: teams D and H.

2) No team has more than two occasions over the whole league where they play two home or two away in a row.

3) There are four pairs of natural opposites: teams A and E, B and F, C and G, and D and H.

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10 Team Matrix

Week	Home team	Away Team
1	A	J
	B	I
	C	H
	D	G
	E	F
2	J	F
	G	E
	H	D
	I	C
	A	B
3	B	J
	C	A
	D	I
	E	H
	F	G
4	J	G
	H	F
	I	E
	A	D
	B	C
5	C	J
	D	B
	E	A
	F	I
	G	H
6	J	H
	I	G
	A	F
	B	E
	C	D
7	D	J
	E	C
	F	B
	G	A
	H	I
8	J	I
	A	H
	B	G
	C	F
	D	E
9	E	J
	F	D
	G	C
	H	B
	I	A

Home and Away for each team:

Team	*Week 1*	*Week 2*	*Week 3*	*Week 4*	*Week 5*	*Week 6*	*Week 7*	*Week 8*	*Week 9*
A	H	H	A	H	A	H	A	H	A
B	H	A	H	H	A	H	A	H	A
C	H	A	H	A	H	H	A	H	A
D	H	A	H	A	H	A	H	H	A
E	H	A	H	A	H	A	H	A	H
F	A	A	H	A	H	A	H	A	H
G	A	H	A	A	H	A	H	A	H
H	A	H	A	H	A	A	H	A	H
I	A	H	A	H	A	H	A	A	H
J	A	H	A	H	A	H	A	H	A

This works well for the following reasons:

1) Two of the teams exactly alternate home and away through any one half.

2) No team has more than two occasions over the whole league where they play two home or two away in a row.

3) There are four pairs of natural opposites: teams A and F, B and G, C and H, and D and I.

Example of using Natural Opposites

Assume that you are using a 10 team matrix, over 5 divisions, and one club has 5 teams and they need to minimise the number of teams playing at home in any given week.

You cannot avoid the club having 3 teams playing at home some weeks but by using the 'natural opposites' you can easily schedule your matches.

Using the 10 team matrix above, you need to decide which teams will always be 'twinned'. This information is easily obtained from the club concerned and is usually asked for on a league entry form. In our example, Teams 1 and 3 will be twinned, and Teams 2 and 5 will be twinned, with team 4 fitting in as required.

Regardless of which division they are in:

* place Team 1 in position A
* place Team 3 in position A
* place Team 2 in position F
* place Team 5 in position F

(Remember that teams A and F, B and G, C and H, and D and I are natural opposites, and in this example A and F have been used. However, you could use any of the four pairings.)

With the above placings, teams 1 and 3 will **always** be at home together, and teams 2 and 5 will **always** be away.

There is no 'best' position for Team 4 and any position other than A and F gives a clash at home 5 times.

Of course, this assumes that the 5 teams are all in the different divisions. However, as long at you don't need to put 4 teams into the same division, you can use the above system.

With 3 teams in the same division, ensure that two of them are in natural opposites positions, such as A and F. Then ensure that two of the teams in others divisions are also on A or F. Team 4 can then use any position other than A or F.