Predicted Skittle League positions based on the end of season performance expressed as ratios of points scored to games played.

2010

Earlier work (Ref. 1) showed that end of season team performances were normally distributed with a mean of 1.0 and standard deviations of 0.293 for Divs 1 & 2 and 0.235 for Divs 3, 4 & 5. This was demonstrated by showing that the performance ranking probabilities fitted those expected from normal distributions with the standard deviations as above. This note examines the relationship between team performance and end of season League position that can be predicted from the distributions.

Page 2 shows the distribution for Divs 3, 4 and 5 in conventional form - i.e. as the Probability Density and Cumulative Probability, plotted using a standard deviation of 0.235. We can derive the mean divisional position distribution from the cumulative probability by using the same ranking probability expression as used for the earlier work. For Divisions of 15 and 16 teams the resulting placings are shown graphically on p.3 and 4. Also shown in each case are the four latest sets of results taken from the League tables given in Ref 2.
The real data confirms the predicted placings very well, but inevitably there is considerable scatter from one season and/or division to another. In all cases, the best guide to the League position at an intermediate stage in the season must be the up-dated League table; but it is useful to know what the historical average would predict as positions can change dramatically as the season progresses.

The bottom two teams in each division are normally relegated each year, but movement may depend on the balancing of numbers necessary due to teams entering and leaving the League. Because of scatter in performance levels some teams will count themselves unfortunate to suffer relegation, whilst others will consider themselves lucky to have survived. This work indicates that a performance figure of .75 will be safe on average, but the actual data plotted on p.5 shows the wide range of team performances which have suffered relegation in Divisions 3, 4 and 5 in recent years.

Ron Jenkins

References

1. *An investigation into the role of chance in determining Skittles League end-of-season positions. To be found on www.thegeordies.org.uk*
2. *Players Handbooks for seasons 2009/10, 2008/9 and 2007/8. Published by the Thornbury & District Skittles League.*

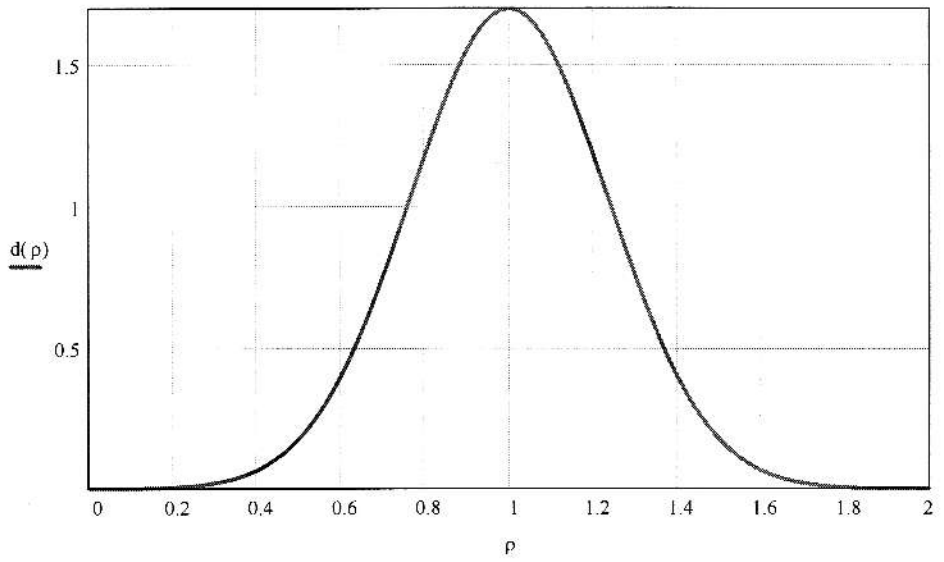
END OF SEASON TEAM PLACES, Position assessment. skitprob

Take ρ as points scored / number of games played

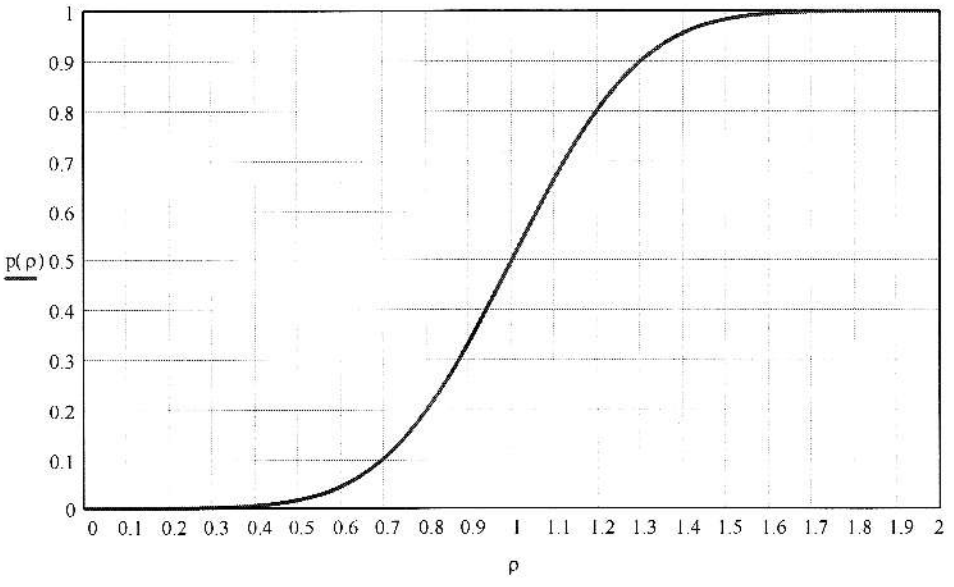
mean ρ $\mu := 1$ standard dev for Divs 3,4,5 $\sigma := .235$

$\rho := 0, 0.02 .. 2$

Probability Density $d(\rho) := dnorm(\rho, \mu, \sigma)$



Cumulative Probability $p(x) := pnorm(\rho, \mu, \sigma)$



Spot value

For bottom $n := 3$ of $m := 15$ $p \frac{n - 0.5}{m}$ $p = 0.167$

This ranking probability function is that used in the derivation of σ

ρ $qnorm(p, \mu, \sigma)$ giving $\rho = 0.773$

Calculated average expected position in Divisions 3,4 and 5.

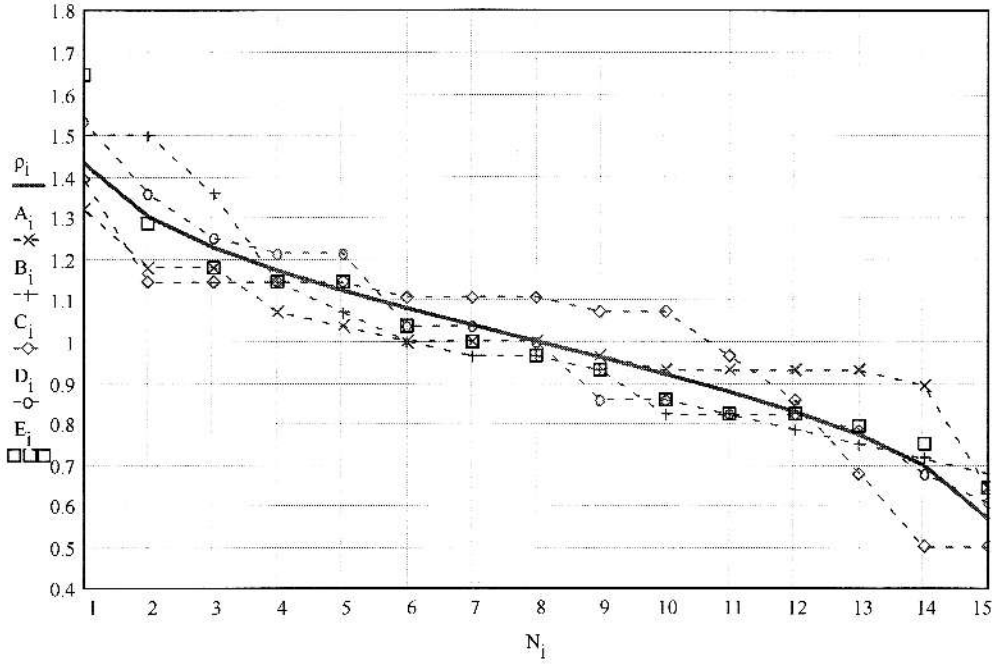
Let number of teams in Division $m := 15$

$$i := 1..m \qquad n_i := i \qquad p_i := \frac{n_i - 0.5}{m} \qquad \rho_i := qnorm(p_i, \mu, \sigma)$$

Position in Division $N_i := (m - n_i) + 1$

Input data.. A_i, B_i, C_i, D_i, E_i taken from Fixture Handbooks

i	N_i	ρ_i	$A_i :=$	$B_i :=$	$C_i :=$	$D_i :=$	$E_i :=$
1	15	0.569	0.642	0.678	.5	.607	.643
2	14	0.699	0.893	0.714	.5	.678	.750
3	13	0.773	0.929	0.75	.679	.786	.796
4	12	0.829	0.929	0.786	.857	.821	.821
5	11	0.877	0.929	.821	.964	.821	.821
6	10	0.92	0.929	.821	1.071	.857	.857
7	9	0.961	0.964	.928	1.071	.857	.929
8	8	1	1.000	.964	1.107	1	.964
9	7	1.039	1.000	.964	1.107	1.036	1.00
10	6	1.08	1.000	1.000	1.107	1.036	1.036
11	5	1.123	1.036	1.071	1.143	1.214	1.143
12	4	1.171	1.071	1.143	1.143	1.214	1.143
13	3	1.227	1.179	1.357	1.143	1.25	1.179
14	2	1.301	1.179	1.5	1.143	1.357	1.286
15	1	1.431	1.321	1.5	1.393	1.535	1.643



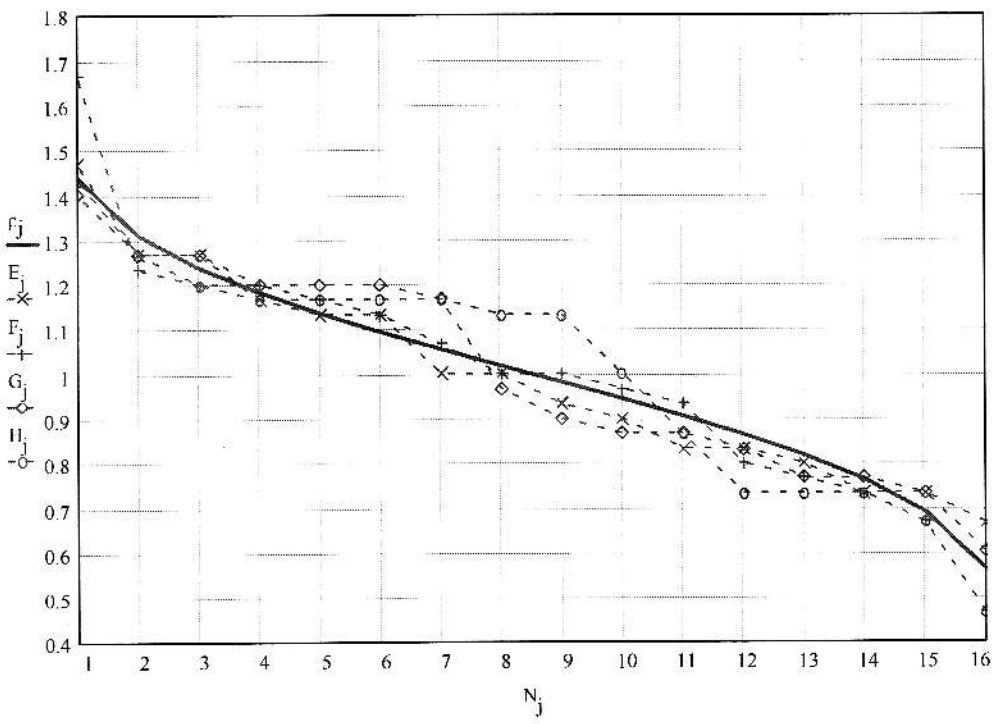
A,B,C, and D are the end of season results for divs 4 and 5 for the seasons 6/7 and 7/8
E gives the results for Div 5 in season 9/10
They show the level of departure from the theoretical average which is to be expected.
It can be seen that they broadly confirm the standard deviation value used.

Let number of teams in Division $m := 16$

$j := 1..m$ $\quad n_j := j$ $\quad p_j := \frac{n_j - 0.5}{m}$ $\quad \rho_j := qnorm(p_j, \mu, \sigma)$

Position in Division $N_j := (m - n_j) + 1$ Input data E_j, F_j, G_j, H_j taken from Fixture Handbooks

j	N_j	ρ_j	E_j	F_j =	G_j	H_j =
1	16	0.562	0.666	.467	.6	.467
2	15	0.69	0.733	.667	.733	.667
3	14	0.763	0.733	0.733	.767	.733
4	13	0.818	0.8	.767	.767	.733
5	12	0.864	0.833	.8	.833	.733
6	11	0.905	0.833	.933	.867	.867
7	10	0.944	0.9	.967	.867	1
8	9	0.982	0.933	1	.9	1.133
9	8	1.018	1.0	1	.967	1.133
10	7	1.056	1.0	1.067	1.167	1.167
11	6	1.095	1.133	1.133	1.2	1.167
12	5	1.136	1.133	1.167	1.2	1.167
13	4	1.182	1.167	1.2	1.2	1.167
14	3	1.237	1.267	1.2	1.267	1.2
15	2	1.31	1.267	1.233	1.267	1.267
16	1	1.438	1.467	1.667	1.4	1.433



E,F,G & H are the end of season results for Div. 3 in 8/9, 7/8 and 6/7 and for Div.5 in 6/7
The same comments given above for the 15 team results apply here also.