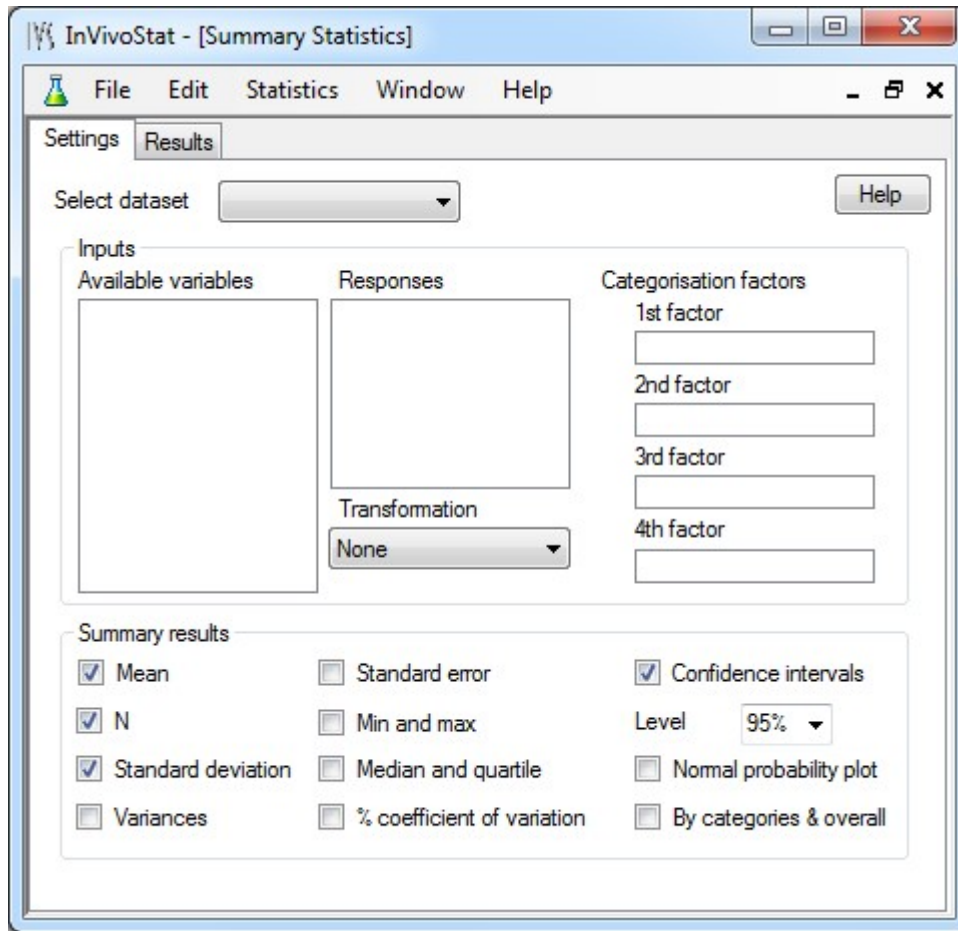


InVivoStat

Summary Statistics Module

Tipsheet

The Summary Statistics module in InVivoStat is available from the Statistics drop-down menu entitled ‘Summary Statistics’. The user interface is:



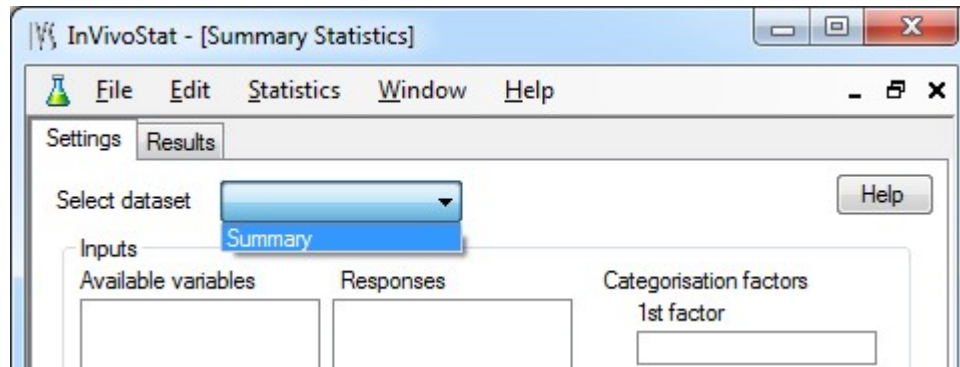
The Summary Statistics module allows the user to compute various summary measures. Multiple responses can be selected and the summary statistics can be broken down by up to four different categorisation factors.

1 Analysis procedure

The module works using a simple five stage process:

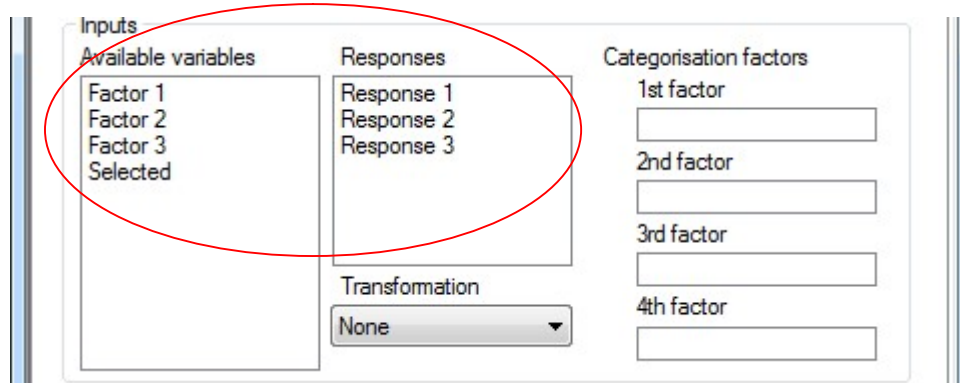
1.1 Select the dataset to be summarised

The analysis begins by selecting a dataset from the drop-down list of available datasets.



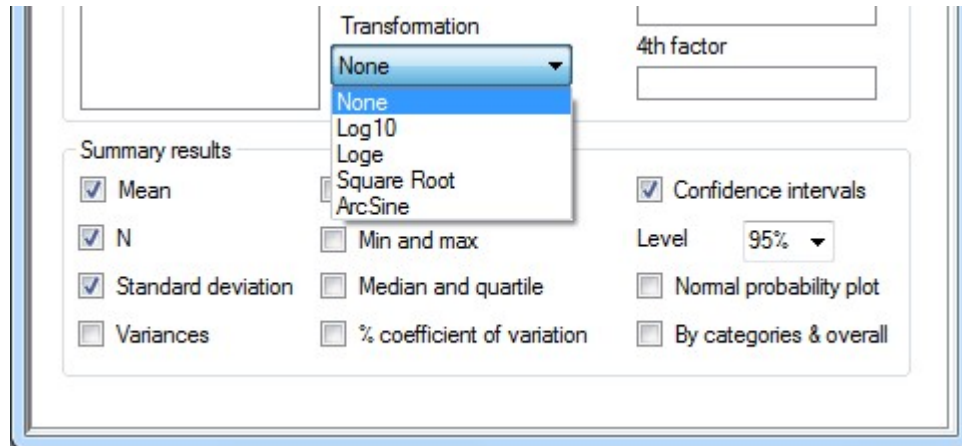
1.2 Select the responses to analyse

Multiple responses can be selected by drag and dropping from the list of available variables into the Responses box.



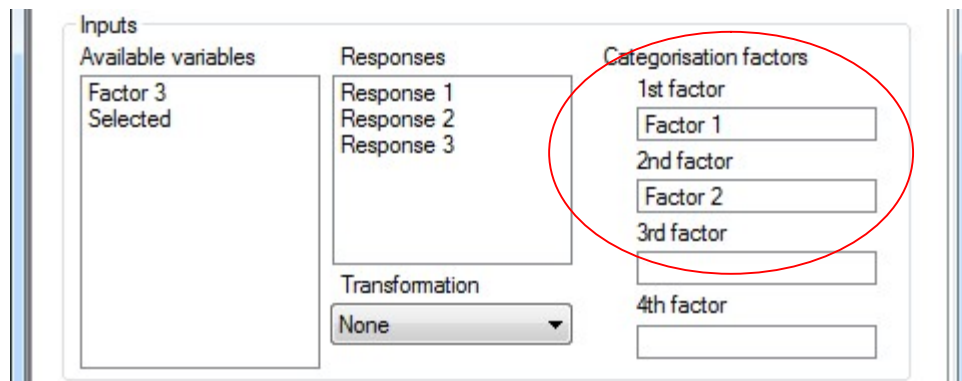
1.3 Select a transformations for the response(s)

The user has the option of \log_{10} , \log_e , square root or arcsine transforming the response variable(s) using the options on the transformation drop-down list.



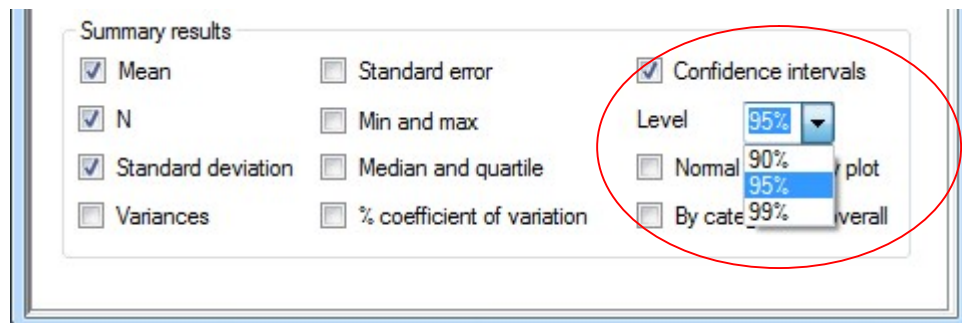
1.4 Select any factors to categorise the results by

Up to four factors (with either numeric or categorical factor levels) can be selected to categorise the results by. Simply drag and drop the factors from the list of available variables into the Categorisation factor boxes.



1.5 Select the summary statistics to be computed

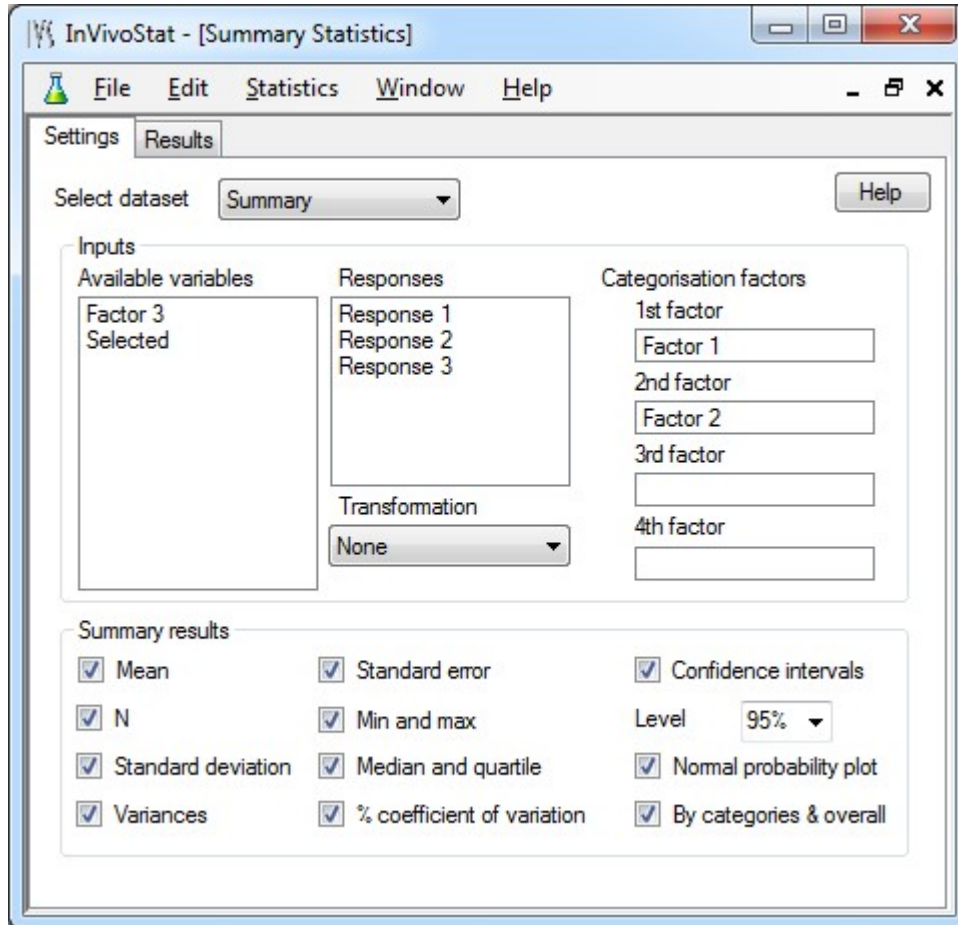
Finally the user should select the output options by highlighting the required summary statistics. The user also has the option to change the default confidence interval around the mean from 95% or another value of their choice.



Finally there are options to produce results categorised by the Categorisation factors (as well as overall) and also to generate Normal probability plots.

2 Sample output

Options:



InVivoStat Summary Statistics

Summary statistics for Response 1 categorised by Factor 1 and Factor 2

	Mean	N	Std dev	Variance	Std error	Lower 95% CI	Upper 95% CI
Categorisation Factor levels							
A 1	0.3307	4	0.1851	0.0343	0.0926	0.0361	0.6253
A 2	0.7591	4	0.1725	0.0298	0.0863	0.4845	1.0336
B 1	0.4049	4	0.2184	0.0477	0.1092	0.0574	0.7524
B 2	0.4970	4	0.2417	0.0584	0.1209	0.1124	0.8817
C 1	0.7300	4	0.2140	0.0458	0.1070	0.3896	1.0705
C 2	0.8614	4	0.0926	0.0086	0.0463	0.7140	1.0088
D 1	0.6532	4	0.1506	0.0227	0.0753	0.4136	0.8928
D 2	0.6371	4	0.2107	0.0444	0.1054	0.3018	0.9724

Overall summary statistics, ignoring the categorisation factor(s), for Response 1

	Mean	N	Std dev	Variance	Std error	Lower 95% CI	Upper 95% CI
Response 1	0.6092	32	0.2420	0.0586	0.0428	0.5219	0.6964

Summary statistics for Response 2 categorised by Factor 1 and Factor 2

	Mean	N	Std dev	Variance	Std error	Lower 95% CI	Upper 95% CI
Categorisation Factor levels							
A 1	0.3658	4	0.4226	0.1786	0.2113	-0.3066	1.0383
A 2	0.4217	4	0.3866	0.1494	0.1933	-0.1935	1.0368
B 1	0.4524	4	0.3835	0.1471	0.1918	-0.1578	1.0627
B 2	0.5336	4	0.4801	0.2305	0.2400	-0.2303	1.2976
C 1	0.5268	4	0.3622	0.1312	0.1811	-0.0496	1.1031
C 2	0.5391	4	0.3427	0.1174	0.1714	-0.0063	1.0844
D 1	0.5302	4	0.2835	0.0803	0.1417	0.0792	0.9813
D 2	0.4159	4	0.3501	0.1225	0.1750	-0.1411	0.9729

Overall summary statistics, ignoring the categorisation factor(s), for Response 2

	Mean	N	Std dev	Variance	Std error	Lower 95% CI	Upper 95% CI
Response 2	0.4732	32	0.3408	0.1161	0.0602	0.3503	0.5960

Summary statistics for Response 3 categorised by Factor 1 and Factor 2

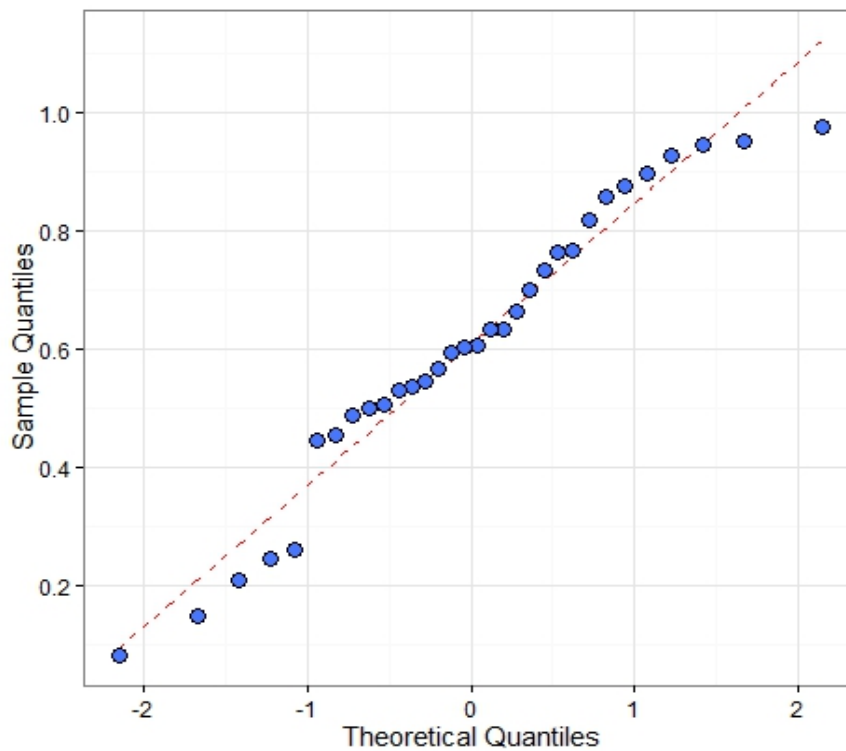
	Mean	N	Std dev	Variance	Std error	Lower 95% CI	Upper 95% CI
Categorisation Factor levels							
A 1	0.4401	4	0.1335	0.0178	0.0668	0.2276	0.6525
A 2	0.3134	4	0.3327	0.1107	0.1664	-0.2161	0.8428
B 1	0.3653	4	0.2405	0.0578	0.1202	-0.0173	0.7480
B 2	0.8284	4	0.1292	0.0167	0.0646	0.6229	1.0339
C 1	0.3804	4	0.2448	0.0599	0.1224	-0.0092	0.7699
C 2	0.3349	4	0.2299	0.0528	0.1149	-0.0309	0.7007
D 1	0.5013	4	0.3514	0.1235	0.1757	-0.0579	1.0605
D 2	0.4217	4	0.2617	0.0685	0.1308	0.0054	0.8381

Overall summary statistics, ignoring the categorisation factor(s), for Response 3

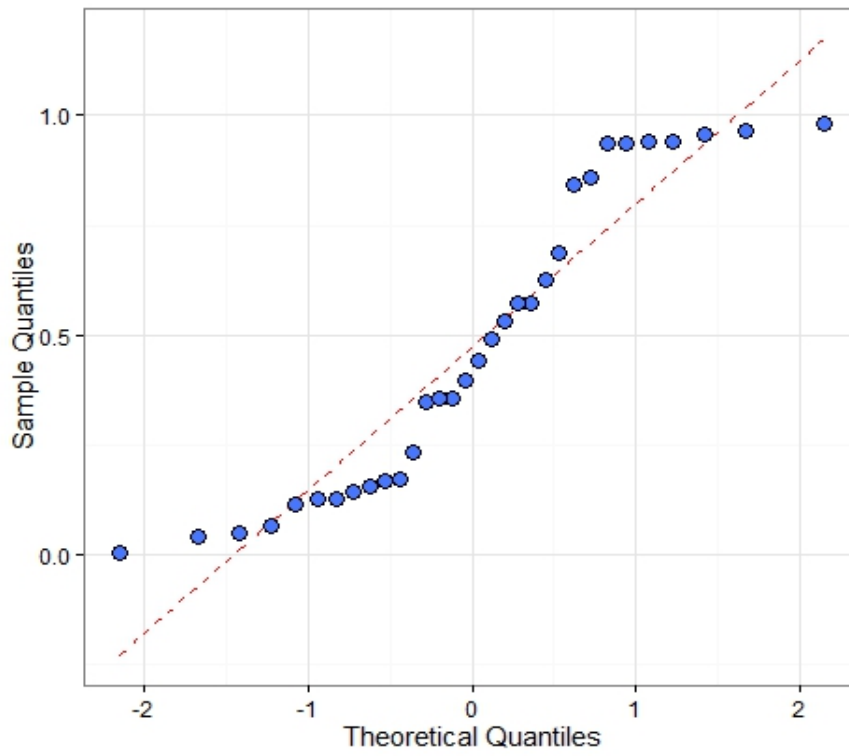
	Mean	N	Std dev	Variance	Std error	Lower 95% CI	Upper 95% CI
Response 3	0.4482	32	0.2715	0.0737	0.0480	0.3503	0.5461

Normal probability plot

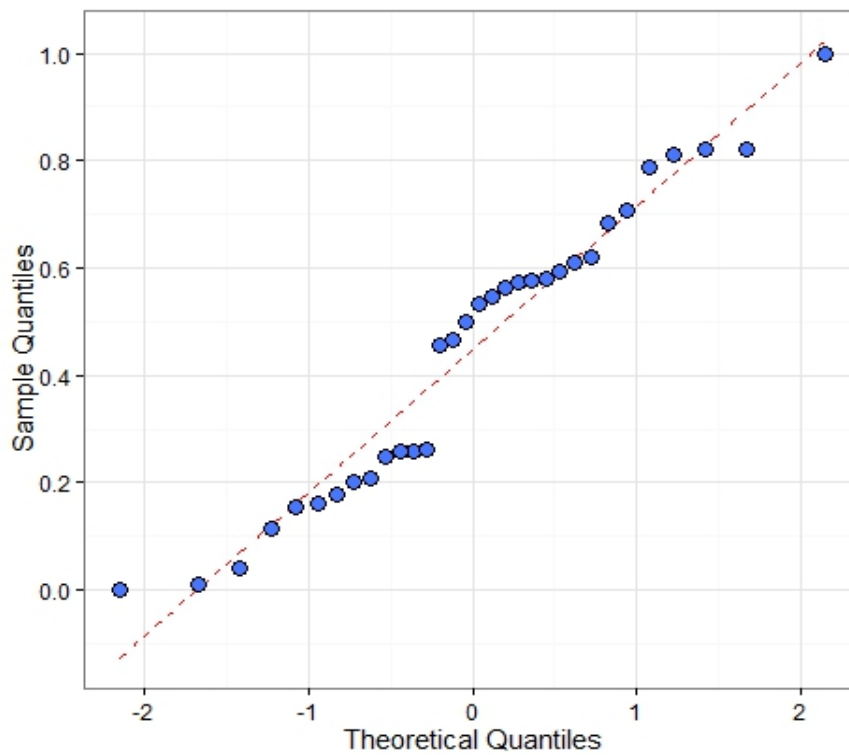
Normal probability plot for Response 1



Normal probability plot for Response 2



Normal probability plot for Response 3



Tip: Check that the points lie along the dotted line. If not then the data may be non-normally distributed.

Warning: This Normal probability plot does not take into account the categorisation factors. If you wish to assess normality after taking the categorisation factors into account, please use the plot in the Single Measures Parametric Analysis module.

For more information on the theoretical approaches that are implemented within this module, see Bate and Clark (2014).

Statistical references

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Erich Neuwirth (2011). *RColorBrewer: ColorBrewer palettes*. R package version 1.0-5. <http://CRAN.R-project.org/package=RColorBrewer>

H. Wickham. *ggplot2: elegant graphics for data analysis*. Springer New York, 2009.

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Hadley Wickham (2011). The Split-Apply-Combine Strategy for Data Analysis. *Journal of Statistical Software*, 40(1), 1-29. URL <http://www.jstatsoft.org/v40/i01/>.

Hadley Wickham (2012). *scales: Scale functions for graphics*. R package version 0.2.3. <http://CRAN.R-project.org/package=scales>

Lecoutre, Eric (2003). *The R2HTML Package*. R News, Vol 3. N. 3, Vienna, Austria.

Louis Kates and Thomas Petzoldt (2012). *proto: Prototype object-based programming*. R package version 0.3-10. <http://CRAN.R-project.org/package=proto>

Analysis dataset

	Response 1	Response 2	Response 3	Factor 1	Factor 2
1	0.260	0.0405	0.58000	A	1

2	0.247	0.9347	0.46729	A	1
3	0.209	0.4400	0.25855	A	1
4	0.607	0.0482	0.45443	A	1
5	0.663	0.3480	0.19988	A	2
6	0.566	0.0043	0.25716	A	2
7	0.878	0.3950	0.78656	A	2
8	0.929	0.9394	0.00981	A	2
9	0.455	0.5742	0.54557	B	1
10	0.083	0.9414	0.20725	B	1
11	0.537	0.1276	0.59484	B	1
12	0.545	0.1665	0.11368	B	1
13	0.702	0.1726	0.68311	B	2
14	0.532	0.9369	0.99752	B	2
15	0.150	0.0667	0.81159	B	2
16	0.605	0.9584	0.82140	B	2
17	0.635	0.9822	0.17914	C	1
18	0.487	0.3582	0.56338	C	1
19	0.978	0.6249	0.15960	C	1
20	0.819	0.1419	0.61932	C	1
21	0.735	0.1289	0.53478	C	2
22	0.899	0.9643	0.26171	C	2
23	0.859	0.4917	0.50085	C	2
24	0.953	0.5714	0.04220	C	2
25	0.767	0.8445	0.60959	D	1
26	0.447	0.2338	0.00065	D	1
27	0.765	0.6860	0.57271	D	1
28	0.634	0.3566	0.82231	D	1
29	0.594	0.1150	0.15502	D	2
30	0.501	0.1570	0.70584	D	2
31	0.947	0.5324	0.24960	D	2
32	0.507	0.8592	0.57644	D	2