



# DELTA classification programs

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**M. J. Dallwitz**

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## Introduction

The following programs work on distance matrices produced by the program Dist.

**Pclass.** Agglomerative clustering by combinatorial sorting strategies.

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To run them, open a 'Command Prompt' window (see [Programs available in the DELTA System](#)), and change to the relevant data folder (using the standard Windows command 'cd' or the DELTA command 'to'). Enter the program name and respond to the prompts, which request information such as the number of OTUs (taxa) and the name of the distance-matrix file.

## Pclass

Pclass carries out agglomerative clustering by combinatorial sorting strategies.

The prompts, and an example of user input for the DELTA sample data, are shown below.

```
Enter number of OTUs:14
Enter name of file with distances:grass.dis
Print output on screen, file, or both [default F]:
Enter name for print file [default PCLASS.OUT]:
Trees in Txplot, Nexus, Phylip, or Hennig format ("- " for none) [default T]:p
Enter name for tree file [default grass.TRE]:
Enter name of taxon-name file, or "-" if none [default grass.NAM]:
```

Available methods are:

```
1 - nearest neighbour    2 - furthest neighbour
3 - UPGMA                4 - WPGMA
5 - L & W flexible      6 - Colless variable
7 - ISS flexible        8 - ISS variable
9 - generalized
```

```
Enter method number [default 7]:
```

```
Enter clustering intensity [default 0.25]:
```

```
Rerun? [default N]:
```

Most of the clustering methods are described in 'Sneath, P.H.A., and Sokal, R.R. 1973. Numerical taxonomy — the principles and practice of numerical classification. W. H. Freeman: San Francisco'. The 'ISS flexible' method is described in 'Dallwitz, M.J. 1988. [A flexible clustering method based on UPGMA and ISS](#)'.

Output produced by Pclass can be converted to graphical trees by means of the program [TreeView](#). When running Pclass, specify 'Phylip' format for the tree.

The output (pclass.out) from the above run is shown below.

```
PCLASS Version 2.02 (MS-DOS). 28-AUG-16

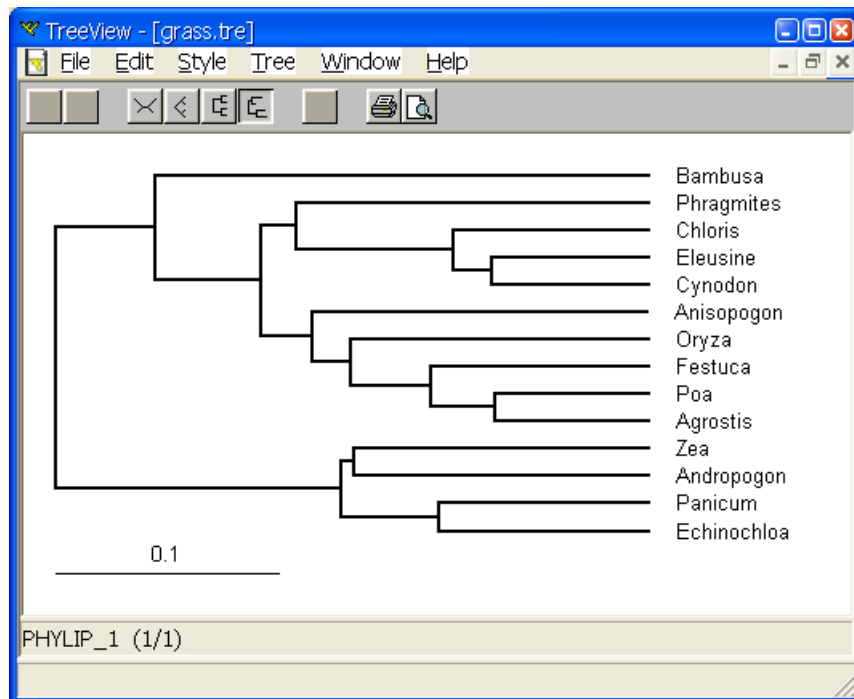
Analysis of data from file grass.dis

Run number 1.

Increment-in-sum-of-squares flexible sorting, intensity 0.25

      Fusion
1  +  13  =  15  at  0.1366
6  +   8  =  16  at  0.1401
5  +  16  =  17  at  0.1743
7  +  11  =  18  at  0.1869
9  +  15  =  19  at  0.1941
2  +  14  =  20  at  0.2633
10 +  19  =  21  at  0.2666
18 +  20  =  22  at  0.2745
3  +  21  =  23  at  0.3005
12 +  17  =  24  at  0.3158
23 +  24  =  25  at  0.3469
4  +  25  =  26  at  0.4418
22 +  26  =  27  at  0.5317
```

A TreeView display of the above data is shown below. Note that annotation for the length of the scale line should be doubled to measure the fusion level; in this example, the scale annotation should be 0.2.



**Nsim**

Nsim lists nearest neighbours of taxa.

The prompts, and an example of user input for the DELTA sample data, are shown below.

```
Enter number of OTUs:14
Enter name of file with distances:grass.dis
Is there a file of OTU names? [default Y]:
Enter name of file with OTU names [default grass.NAM]:
Output on screen, file, or both [default F]:
Enter line length for output [default 80]:
Enter name for output file [default NSIM.OUT]:
Enter number of neighbours required [default 13]:6
Enter name or number of reference OTU (default all):
```

The output (nsim.out) from the above run is shown below.

```
NSIM Version 2.03 (MS-DOS). 28-AUG-16
```

```
Table of 6 nearest neighbours in matrix grass.dis
```

From:	To:				
Agrostis....	Poa.....	0.1366	Festuca.....	0.2123	Anisopogon.. 0.2364
	Cynodon.....	0.2625	Panicum.....	0.2678	Chloris..... 0.2798
Andropogon..	Echinochloa.	0.2358	Zea.....	0.2633	Panicum..... 0.2929
	Agrostis....	0.3414	Chloris.....	0.3521	Cynodon..... 0.3881
Anisopogon..	Agrostis....	0.2364	Festuca.....	0.2509	Poa..... 0.2899
	Chloris.....	0.3438	Oryza.....	0.3641	Bambusa..... 0.3868
Bambusa.....	Oryza.....	0.3030	Festuca.....	0.3389	Phragmites.. 0.3695
	Anisopogon..	0.3868	Poa.....	0.3887	Cynodon..... 0.4458
Chloris.....	Cynodon.....	0.1596	Eleusine....	0.1821	Poa..... 0.2107
	Festuca.....	0.2668	Phragmites..	0.2688	Agrostis.... 0.2798
Cynodon.....	Eleusine....	0.1401	Chloris.....	0.1596	Poa..... 0.2145
	Echinochloa.	0.2439	Agrostis....	0.2625	Panicum..... 0.2728
Echinochloa.	Panicum.....	0.1869	Andropogon..	0.2358	Cynodon..... 0.2439
	Zea.....	0.2439	Chloris.....	0.2805	Phragmites.. 0.3329
Eleusine....	Cynodon.....	0.1401	Chloris.....	0.1821	Poa..... 0.1843
	Festuca.....	0.2667	Agrostis....	0.2834	Phragmites.. 0.3174
Festuca.....	Poa.....	0.1645	Agrostis....	0.2123	Oryza..... 0.2371
	Anisopogon..	0.2509	Phragmites..	0.2607	Eleusine.... 0.2667
Oryza.....	Festuca.....	0.2371	Poa.....	0.2375	Agrostis.... 0.2849
	Cynodon.....	0.2858	Phragmites..	0.2901	Bambusa..... 0.3030
Panicum.....	Echinochloa.	0.1869	Agrostis....	0.2678	Cynodon..... 0.2728
	Zea.....	0.2837	Andropogon..	0.2929	Phragmites.. 0.2933
Phragmites..	Festuca.....	0.2607	Poa.....	0.2633	Chloris..... 0.2688
	Oryza.....	0.2901	Panicum.....	0.2933	Cynodon..... 0.2978
Poa.....	Agrostis....	0.1366	Festuca.....	0.1645	Eleusine.... 0.1843
	Chloris.....	0.2107	Cynodon.....	0.2145	Oryza..... 0.2375
Zea.....	Echinochloa.	0.2439	Andropogon..	0.2633	Panicum..... 0.2837
	Agrostis....	0.3520	Oryza.....	0.3811	Cynodon..... 0.3940