Subject: Curious Cluster Analysis Conundrum
Posted by jack.connerney on Wed, 17 Jul 2013 19:03:14 GMT
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I'm using

```
iwts   = CLUST_WTS(ibza,N_CLUSTERS=2)
result = CLUSTER(ibza, iwts, n_clusters=2)
```

to perform a cluster analysis on a 2 by nrows array (first two components of variable "zeros", 20 rows), and, contrary to my expectation, I find that the cluster analysis gives different results when the same program is run on precisely the same data a second time - that is, the cluster is not recognized the first time the pro is run, it is recognized the second time the pro is run, and yet not recognized again the third and forth time the pro is run.

Shouldn't the result of the same computation be the same each time?

Here's the output from two successive runs of the pro - the cluster is recognized the second run (array printed with cluster designation in third column; the cluster we want to identify is marked "1" in the second run).

```
IDL>  zcan2,FNAME='3D-021877F0E7-2013-007T11.07.47.sts',IB_DZ,OB_D Z,ZQ,
         LAG=2,/SECONDS,HODO=4,/ZC,/VERBOSE,/VVERBOSE,SPINS=2
set =    0      0     30  zeros = -1.965 -2.002 -0.774  zq=   0.61
set =    1     30     60  zeros = -1.997 -2.013 -0.764  zq=   0.65
set =    2     60     90  zeros = -1.947 -1.951 -0.625  zq=   0.55
set =    3     90    120  zeros = -1.991 -1.978 -0.641  zq=   0.68
set =    4    120    150  zeros = -1.918 -1.985 -0.484  zq=   2.32
set =    5    150    180  zeros = -1.998 -1.960 -0.224  zq=   0.72
set =    6    180    210  zeros = -2.002 -2.007 -0.040  zq=   1.39
set =    7    210    240  zeros = -1.970 -1.976 -0.385  zq=   2.24
set =    8    240    270  zeros = -1.992 -1.985 -0.236  zq=   1.84
set =    9    270    300  zeros = -2.033 -1.976 -0.484  zq=   0.65
set =   10    300    330  zeros = -1.971 -1.980  0.018  zq=   3.10
set =   11    330    360  zeros = -2.037 -1.932 -0.726  zq=   0.91
set =   12    360    390  zeros = -2.041 -1.949 -0.356  zq=   1.26
set =   13    390    420  zeros = -2.084 -1.890 -0.133  zq=   1.27
set =   14    420    450  zeros = -2.107 -1.894 -0.186  zq=   1.34
set =   15    450    480  zeros = -2.065 -1.905 -0.239  zq=   0.79
set =   16    480    510  zeros = -2.084 -1.877 -0.507  zq=   1.06
set =   17    510    540  zeros = -2.077 -1.878 -0.082  zq=   1.79
set =   18    540    570  zeros = -2.079 -1.884 -0.521  zq=   1.32
set =   19    570    599  zeros = -2.091 -1.899 -0.240  zq=   1.84

  -1.965   -2.002      0
  -1.997   -2.013      0
  -1.947   -1.951      0
  -1.991   -1.978      0
```

```
  -1.918   -1.985       0
  -1.998   -1.960       0
  -2.002   -2.007       0
  -1.970   -1.976       0
  -1.992   -1.985       0
  -2.033   -1.976       0
  -1.971   -1.980       0
  -2.037   -1.932       0
  -2.041   -1.949       0
  -2.084   -1.890       0
  -2.107   -1.894       0
  -2.065   -1.905       0
  -2.084   -1.877       0
  -2.077   -1.878       0
  -2.079   -1.884       0
  -2.091   -1.899       0

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  -1.965   -2.002       0
  -1.997   -2.013       0
  -1.947   -1.951       0
  -1.991   -1.978       0
  -1.918   -1.985       0
  -1.998   -1.960       0
  -2.002   -2.007       0
  -1.970   -1.976       0
```

```
  -1.992  -1.985      0
  -2.033  -1.976      0
  -1.971  -1.980      0
  -2.037  -1.932      1
  -2.041  -1.949      0
  -2.084  -1.890      1
  -2.107  -1.894      1
  -2.065  -1.905      1
  -2.084  -1.877      1
  -2.077  -1.878      1
  -2.079  -1.884      1
  -2.091  -1.899      1
IDL>
```

So, I'm thinking that CLUSTER uses some kind of random seed, and sometimes it works, sometimes not?
