In [ ]:
```
#Load statistical analysis
import pandas as pd
from scipy.stats import f_oneway
from statsmodels.stats.multicomp import pairwise_tukeyhsd
```

In [ ]:
```
anova_data = pd.read_csv('treatment2.csv')
anova_data
```

Out[ ]:

	Variables	PR1	PR2	PR3	DR1	DR2	DR3	MR1	MR2	MR3
0	CONTROL	20.33	21.48	20.85	642.7	594.30	603.67	106.4	113.26	103.99
1	NHT0254b	-2.93	-1.31	-2.34	497.2	526.34	512.53	132.5	138.13	132.77
2	NGB00749	1.75	1.69	1.74	1052.4	1059.70	1029.26	93.0	90.50	85.92
3	NHT356b	-4.45	-1.82	-0.88	582.4	545.93	549.94	160.6	151.67	168.40
4	NHT0343a	9.11	9.59	8.76	350.7	374.33	363.21	230.5	226.70	237.14
5	NHT0216a	1.91	1.95	1.89	749.4	755.19	740.74	104.6	102.27	102.18
6	NHT0366	-0.30	-0.05	-0.24	374.8	356.03	381.00	196.1	208.53	195.82
7	NHT0355a	-7.04	-1.34	-1.18	353.0	353.82	332.06	398.9	367.27	416.24
8	NHT034a	12.12	11.52	12.54	871.0	850.51	819.58	103.8	110.73	108.64
9	NHT0347	-10.92	-11.43	-3.94	1162.0	1099.16	1165.73	199.3	209.93	213.56
10	NHT0339a	-16.09	-1.87	-14.17	424.4	447.64	440.64	314.2	305.47	310.67
11	NHT0259a	-17.56	-12.12	-15.90	294.7	271.93	300.03	227.1	223.81	236.35
12	NGB00739	-0.13	-0.13	-0.03	698.3	666.36	748.54	176.0	176.83	175.70
13	NGB00711	3.93	3.75	4.06	210.7	217.59	223.25	221.3	223.21	235.37
14	NGB00733	-3.27	-0.82	-1.44	356.4	336.96	379.76	172.1	158.87	178.78

In [ ]:
```
# Reshape the data to long format for Data P
data_pt = anova_data.melt(id_vars='Variables', value_vars=['PR1', 'PR2', 'PR3'],
```

In [ ]:
```
# Group the data by 'PT' and collect all values into lists (for ANOVA)
grouped_data = data_pt.groupby('Variables')['Value'].apply(list)

# Perform one-way ANOVA
anova_result = f_oneway(*grouped_data)
anova_result
```

Out[ ]:
```
F_onewayResult(statistic=35.50527199861019, pvalue=8.326226584879168e-15)
```

In [ ]:
```
# Perform Tukey's HSD test (ANOVA - POSTHOC)
tukey_result = pairwise_tukeyhsd(endog=data_pt['Value'], groups=data_pt['Variabl
print(tukey_result.summary())
```

Multiple Comparison of Means - Tukey HSD, FWER=0.05

group1	group2	meandiff	p-adj	lower	upper	reject
CONTROL	NGB00711	-16.9733	0.0	-24.8383	-9.1084	True
CONTROL	NGB00733	-22.73	0.0	-30.5949	-14.8651	True
CONTROL	NGB00739	-20.9833	0.0	-28.8483	-13.1184	True
CONTROL	NGB00749	-19.16	0.0	-27.0249	-11.2951	True
CONTROL	NHT0216a	-18.97	0.0	-26.8349	-11.1051	True
CONTROL	NHT0254b	-23.08	0.0	-30.9449	-15.2151	True
CONTROL	NHT0259a	-36.08	0.0	-43.9449	-28.2151	True
CONTROL	NHT0339a	-31.5967	0.0	-39.4616	-23.7317	True
CONTROL	NHT0343a	-11.7333	0.0005	-19.5983	-3.8684	True
CONTROL	NHT0347	-29.65	0.0	-37.5149	-21.7851	True
CONTROL	NHT034a	-8.8267	0.0169	-16.6916	-0.9617	True
CONTROL	NHT0355a	-24.0733	0.0	-31.9383	-16.2084	True
CONTROL	NHT0366	-21.0833	0.0	-28.9483	-13.2184	True
CONTROL	NHT356b	-23.27	0.0	-31.1349	-15.4051	True
NGB00711	NGB00733	-5.7567	0.3526	-13.6216	2.1083	False
NGB00711	NGB00739	-4.01	0.8455	-11.8749	3.8549	False
NGB00711	NGB00749	-2.1867	0.999	-10.0516	5.6783	False
NGB00711	NHT0216a	-1.9967	0.9996	-9.8616	5.8683	False
NGB00711	NHT0254b	-6.1067	0.2695	-13.9716	1.7583	False
NGB00711	NHT0259a	-19.1067	0.0	-26.9716	-11.2417	True
NGB00711	NHT0339a	-14.6233	0.0	-22.4883	-6.7584	True
NGB00711	NHT0343a	5.24	0.4973	-2.6249	13.1049	False
NGB00711	NHT0347	-12.6767	0.0001	-20.5416	-4.8117	True
NGB00711	NHT034a	8.1467	0.0367	0.2817	16.0116	True
NGB00711	NHT0355a	-7.1	0.1103	-14.9649	0.7649	False
NGB00711	NHT0366	-4.11	0.8226	-11.9749	3.7549	False
NGB00711	NHT356b	-6.2967	0.2304	-14.1616	1.5683	False
NGB00733	NGB00739	1.7467	0.9999	-6.1183	9.6116	False
NGB00733	NGB00749	3.57	0.9256	-4.2949	11.4349	False
NGB00733	NHT0216a	3.76	0.8953	-4.1049	11.6249	False
NGB00733	NHT0254b	-0.35	1.0	-8.2149	7.5149	False
NGB00733	NHT0259a	-13.35	0.0001	-21.2149	-5.4851	True
NGB00733	NHT0339a	-8.8667	0.0161	-16.7316	-1.0017	True
NGB00733	NHT0343a	10.9967	0.0012	3.1317	18.8616	True
NGB00733	NHT0347	-6.92	0.1313	-14.7849	0.9449	False
NGB00733	NHT034a	13.9033	0.0	6.0384	21.7683	True
NGB00733	NHT0355a	-1.3433	1.0	-9.2083	6.5216	False
NGB00733	NHT0366	1.6467	1.0	-6.2183	9.5116	False
NGB00733	NHT356b	-0.54	1.0	-8.4049	7.3249	False
NGB00739	NGB00749	1.8233	0.9999	-6.0416	9.6883	False
NGB00739	NHT0216a	2.0133	0.9996	-5.8516	9.8783	False
NGB00739	NHT0254b	-2.0967	0.9994	-9.9616	5.7683	False
NGB00739	NHT0259a	-15.0967	0.0	-22.9616	-7.2317	True
NGB00739	NHT0339a	-10.6133	0.0019	-18.4783	-2.7484	True
NGB00739	NHT0343a	9.25	0.0102	1.3851	17.1149	True
NGB00739	NHT0347	-8.6667	0.0204	-16.5316	-0.8017	True
NGB00739	NHT034a	12.1567	0.0003	4.2917	20.0216	True
NGB00739	NHT0355a	-3.09	0.9748	-10.9549	4.7749	False
NGB00739	NHT0366	-0.1	1.0	-7.9649	7.7649	False
NGB00739	NHT356b	-2.2867	0.9985	-10.1516	5.5783	False
NGB00749	NHT0216a	0.19	1.0	-7.6749	8.0549	False
NGB00749	NHT0254b	-3.92	0.8647	-11.7849	3.9449	False
NGB00749	NHT0259a	-16.92	0.0	-24.7849	-9.0551	True
NGB00749	NHT0339a	-12.4367	0.0002	-20.3016	-4.5717	True
NGB00749	NHT0343a	7.4267	0.0794	-0.4383	15.2916	False
NGB00749	NHT0347	-10.49	0.0022	-18.3549	-2.6251	True

```
 NGB00749   NHT034a  10.3333 0.0027   2.4684  18.1983   True
 NGB00749  NHT0355a  -4.9133 0.5966 -12.7783   2.9516  False
 NGB00749   NHT0366  -1.9233 0.9998  -9.7883   5.9416  False
 NGB00749   NHT356b    -4.11 0.8226 -11.9749   3.7549  False
 NHT0216a  NHT0254b    -4.11 0.8226 -11.9749   3.7549  False
 NHT0216a NHT0259a    -17.11    0.0 -24.9749  -9.2451   True
 NHT0216a  NHT0339a -12.6267 0.0001 -20.4916  -4.7617   True
 NHT0216a  NHT0343a   7.2367 0.0963  -0.6283  15.1016  False
 NHT0216a   NHT0347   -10.68 0.0018 -18.5449  -2.8151   True
 NHT0216a   NHT034a  10.1433 0.0034   2.2784  18.0083   True
 NHT0216a  NHT0355a  -5.1033 0.5385 -12.9683   2.7616  False
 NHT0216a   NHT0366  -2.1133 0.9993  -9.9783   5.7516  False
 NHT0216a   NHT356b     -4.3  0.775 -12.1649   3.5649  False
 NHT0254b NHT0259a     -13.0 0.0001 -20.8649  -5.1351   True
 NHT0254b  NHT0339a  -8.5167 0.0242 -16.3816  -0.6517   True
 NHT0254b  NHT0343a  11.3467 0.0008   3.4817  19.2116   True
 NHT0254b   NHT0347    -6.57 0.1816 -14.4349   1.2949  False
 NHT0254b   NHT034a  14.2533    0.0   6.3884  22.1183   True
 NHT0254b  NHT0355a  -0.9933    1.0  -8.8583   6.8716  False
 NHT0254b   NHT0366   1.9967 0.9996  -5.8683   9.8616  False
 NHT0254b   NHT356b    -0.19    1.0  -8.0549   7.6749  False
NHT0259a   NHT0339a   4.4833 0.7247  -3.3816  12.3483  False
NHT0259a   NHT0343a  24.3467    0.0  16.4817  32.2116   True
NHT0259a    NHT0347     6.43 0.2055  -1.4349  14.2949  False
NHT0259a    NHT034a  27.2533    0.0  19.3884  35.1183   True
NHT0259a   NHT0355a  12.0067 0.0003   4.1417  19.8716   True
NHT0259a    NHT0366  14.9967    0.0   7.1317  22.8616   True
NHT0259a    NHT356b    12.81 0.0001   4.9451  20.6749   True
 NHT0339a  NHT0343a  19.8633    0.0  11.9984  27.7283   True
 NHT0339a   NHT0347   1.9467 0.9997  -5.9183   9.8116  False
 NHT0339a   NHT034a    22.77    0.0  14.9051  30.6349   True
 NHT0339a  NHT0355a   7.5233 0.0719  -0.3416  15.3883  False
 NHT0339a   NHT0366  10.5133 0.0022   2.6484  18.3783   True
 NHT0339a   NHT356b   8.3267   0.03   0.4617  16.1916   True
 NHT0343a   NHT0347 -17.9167    0.0 -25.7816 -10.0517   True
 NHT0343a   NHT034a   2.9067 0.9849  -4.9583  10.7716  False
 NHT0343a  NHT0355a   -12.34 0.0002 -20.2049  -4.4751   True
 NHT0343a   NHT0366    -9.35 0.0091 -17.2149  -1.4851   True
 NHT0343a   NHT356b -11.5367 0.0006 -19.4016  -3.6717   True
  NHT0347   NHT034a  20.8233    0.0  12.9584  28.6883   True
  NHT0347  NHT0355a   5.5767 0.4004  -2.2883  13.4416  False
  NHT0347   NHT0366   8.5667 0.0228   0.7017  16.4316   True
  NHT0347   NHT356b     6.38 0.2146  -1.4849  14.2449  False
  NHT034a  NHT0355a -15.2467    0.0 -23.1116  -7.3817   True
  NHT034a   NHT0366 -12.2567 0.0002 -20.1216  -4.3917   True
  NHT034a   NHT356b -14.4433    0.0 -22.3083  -6.5784   True
 NHT0355a   NHT0366     2.99 0.9808  -4.8749  10.8549  False
 NHT0355a   NHT356b   0.8033    1.0  -7.0616   8.6683  False
  NHT0366   NHT356b  -2.1867  0.999 -10.0516   5.6783  False
-----------------------------------------------------------
```

In [ ]:
```
# Reshape the data to long format for Data D
data_dt = anova_data.melt(id_vars='Variables', value_vars=['DR1', 'DR2', 'DR3'],
```

In [ ]:
```
# Group the data by 'DT' and collect all values into lists (for ANOVA)
grouped_data = data_dt.groupby('Variables')['Value'].apply(list)

# Perform one-way ANOVA
```

```
anova_result = f_oneway(*grouped_data)
anova_result
```

Out[ ]:
```
F_onewayResult(statistic=522.0569566426879, pvalue=7.887730813394322e-32)
```

In [ ]:
```
# Perform Tukey's HSD test (ANOVA - POSTHOC)
tukey_result = pairwise_tukeyhsd(endog=data_dt['Value'], groups=data_dt['Variabl
print(tukey_result.summary())
```

Multiple Comparison of Means - Tukey HSD, FWER=0.05

group1	group2	meandiff	p-adj	lower	upper	reject
CONTROL	NGB00711	-396.3767	0.0	-459.9035	-332.8499	True
CONTROL	NGB00733	-255.85	0.0	-319.3768	-192.3232	True
CONTROL	NGB00739	90.8433	0.0009	27.3165	154.3701	True
CONTROL	NGB00749	433.5633	0.0	370.0365	497.0901	True
CONTROL	NHT0216a	134.8867	0.0	71.3599	198.4135	True
CONTROL	NHT0254b	-101.5333	0.0002	-165.0601	-38.0065	True
CONTROL	NHT0259a	-324.67	0.0	-388.1968	-261.1432	True
CONTROL	NHT0339a	-175.9967	0.0	-239.5235	-112.4699	True
CONTROL	NHT0343a	-250.81	0.0	-314.3368	-187.2832	True
CONTROL	NHT0347	528.74	0.0	465.2132	592.2668	True
CONTROL	NHT034a	233.4733	0.0	169.9465	297.0001	True
CONTROL	NHT0355a	-267.2633	0.0	-330.7901	-203.7365	True
CONTROL	NHT0366	-242.9467	0.0	-306.4735	-179.4199	True
CONTROL	NHT356b	-54.1333	0.1611	-117.6601	9.3935	False
NGB00711	NGB00733	140.5267	0.0	76.9999	204.0535	True
NGB00711	NGB00739	487.22	0.0	423.6932	550.7468	True
NGB00711	NGB00749	829.94	0.0	766.4132	893.4668	True
NGB00711	NHT0216a	531.2633	0.0	467.7365	594.7901	True
NGB00711	NHT0254b	294.8433	0.0	231.3165	358.3701	True
NGB00711	NHT0259a	71.7067	0.0159	8.1799	135.2335	True
NGB00711	NHT0339a	220.38	0.0	156.8532	283.9068	True
NGB00711	NHT0343a	145.5667	0.0	82.0399	209.0935	True
NGB00711	NHT0347	925.1167	0.0	861.5899	988.6435	True
NGB00711	NHT034a	629.85	0.0	566.3232	693.3768	True
NGB00711	NHT0355a	129.1133	0.0	65.5865	192.6401	True
NGB00711	NHT0366	153.43	0.0	89.9032	216.9568	True
NGB00711	NHT356b	342.2433	0.0	278.7165	405.7701	True
NGB00733	NGB00739	346.6933	0.0	283.1665	410.2201	True
NGB00733	NGB00749	689.4133	0.0	625.8865	752.9401	True
NGB00733	NHT0216a	390.7367	0.0	327.2099	454.2635	True
NGB00733	NHT0254b	154.3167	0.0	90.7899	217.8435	True
NGB00733	NHT0259a	-68.82	0.0241	-132.3468	-5.2932	True
NGB00733	NHT0339a	79.8533	0.0047	16.3265	143.3801	True
NGB00733	NHT0343a	5.04	1.0	-58.4868	68.5668	False
NGB00733	NHT0347	784.59	0.0	721.0632	848.1168	True
NGB00733	NHT034a	489.3233	0.0	425.7965	552.8501	True
NGB00733	NHT0355a	-11.4133	1.0	-74.9401	52.1135	False
NGB00733	NHT0366	12.9033	1.0	-50.6235	76.4301	False
NGB00733	NHT356b	201.7167	0.0	138.1899	265.2435	True
NGB00739	NGB00749	342.72	0.0	279.1932	406.2468	True
NGB00739	NHT0216a	44.0433	0.4351	-19.4835	107.5701	False
NGB00739	NHT0254b	-192.3767	0.0	-255.9035	-128.8499	True
NGB00739	NHT0259a	-415.5133	0.0	-479.0401	-351.9865	True
NGB00739	NHT0339a	-266.84	0.0	-330.3668	-203.3132	True
NGB00739	NHT0343a	-341.6533	0.0	-405.1801	-278.1265	True
NGB00739	NHT0347	437.8967	0.0	374.3699	501.4235	True
NGB00739	NHT034a	142.63	0.0	79.1032	206.1568	True
NGB00739	NHT0355a	-358.1067	0.0	-421.6335	-294.5799	True
NGB00739	NHT0366	-333.79	0.0	-397.3168	-270.2632	True
NGB00739	NHT356b	-144.9767	0.0	-208.5035	-81.4499	True
NGB00749	NHT0216a	-298.6767	0.0	-362.2035	-235.1499	True
NGB00749	NHT0254b	-535.0967	0.0	-598.6235	-471.5699	True
NGB00749	NHT0259a	-758.2333	0.0	-821.7601	-694.7065	True
NGB00749	NHT0339a	-609.56	0.0	-673.0868	-546.0332	True
NGB00749	NHT0343a	-684.3733	0.0	-747.9001	-620.8465	True
NGB00749	NHT0347	95.1767	0.0004	31.6499	158.7035	True

```
 NGB00749   NHT034a   -200.09    0.0 -263.6168 -136.5632   True
 NGB00749  NHT0355a -700.8267    0.0 -764.3535 -637.2999   True
 NGB00749   NHT0366   -676.51    0.0 -740.0368 -612.9832   True
 NGB00749   NHT356b -487.6967    0.0 -551.2235 -424.1699   True
 NHT0216a  NHT0254b   -236.42    0.0 -299.9468 -172.8932   True
 NHT0216a NHT0259a  -459.5567    0.0 -523.0835 -396.0299   True
 NHT0216a  NHT0339a -310.8833    0.0 -374.4101 -247.3565   True
 NHT0216a  NHT0343a -385.6967    0.0 -449.2235 -322.1699   True
 NHT0216a   NHT0347  393.8533    0.0  330.3265  457.3801   True
 NHT0216a   NHT034a   98.5867 0.0003   35.0599  162.1135   True
 NHT0216a  NHT0355a   -402.15    0.0 -465.6768 -338.6232   True
 NHT0216a   NHT0366 -377.8333    0.0 -441.3601 -314.3065   True
 NHT0216a   NHT356b   -189.02    0.0 -252.5468 -125.4932   True
 NHT0254b NHT0259a  -223.1367    0.0 -286.6635 -159.6099   True
 NHT0254b  NHT0339a  -74.4633 0.0106 -137.9901  -10.9365   True
 NHT0254b  NHT0343a -149.2767    0.0 -212.8035  -85.7499   True
 NHT0254b   NHT0347  630.2733    0.0  566.7465  693.8001   True
 NHT0254b   NHT034a  335.0067    0.0  271.4799  398.5335   True
 NHT0254b  NHT0355a   -165.73    0.0 -229.2568 -102.2032   True
 NHT0254b   NHT0366 -141.4133    0.0 -204.9401  -77.8865   True
 NHT0254b   NHT356b      47.4 0.3246  -16.1268  110.9268  False
NHT0259a   NHT0339a  148.6733    0.0   85.1465  212.2001   True
NHT0259a   NHT0343a     73.86 0.0116   10.3332  137.3868   True
NHT0259a    NHT0347    853.41    0.0  789.8832  916.9368   True
NHT0259a    NHT034a  558.1433    0.0  494.6165  621.6701   True
NHT0259a   NHT0355a   57.4067 0.1095   -6.1201  120.9335  False
NHT0259a    NHT0366   81.7233 0.0036   18.1965  145.2501   True
NHT0259a    NHT356b  270.5367    0.0  207.0099  334.0635   True
 NHT0339a  NHT0343a  -74.8133 0.0101 -138.3401  -11.2865   True
 NHT0339a   NHT0347  704.7367    0.0  641.2099  768.2635   True
 NHT0339a   NHT034a    409.47    0.0  345.9432  472.9968   True
 NHT0339a  NHT0355a  -91.2667 0.0008 -154.7935  -27.7399   True
 NHT0339a   NHT0366    -66.95 0.0313 -130.4768   -3.4232   True
 NHT0339a   NHT356b  121.8633    0.0   58.3365  185.3901   True
 NHT0343a   NHT0347    779.55    0.0  716.0232  843.0768   True
 NHT0343a   NHT034a  484.2833    0.0  420.7565  547.8101   True
 NHT0343a  NHT0355a  -16.4533 0.9996  -79.9801   47.0735  False
 NHT0343a   NHT0366    7.8633    1.0  -55.6635   71.3901  False
 NHT0343a   NHT356b  196.6767    0.0  133.1499  260.2035   True
  NHT0347   NHT034a -295.2667    0.0 -358.7935 -231.7399   True
  NHT0347  NHT0355a -796.0033    0.0 -859.5301 -732.4765   True
  NHT0347   NHT0366 -771.6867    0.0 -835.2135 -708.1599   True
  NHT0347   NHT356b -582.8733    0.0 -646.4001 -519.3465   True
  NHT034a  NHT0355a -500.7367    0.0 -564.2635 -437.2099   True
  NHT034a   NHT0366   -476.42    0.0 -539.9468 -412.8932   True
  NHT034a   NHT356b -287.6067    0.0 -351.1335 -224.0799   True
 NHT0355a   NHT0366   24.3167 0.9797  -39.2101   87.8435  False
 NHT0355a   NHT356b    213.13    0.0  149.6032  276.6568   True
  NHT0366   NHT356b  188.8133    0.0  125.2865  252.3401   True
-----------------------------------------------------------------
```

In [ ]:
```
# Reshape the data to long format for Data M
data_mt = anova_data.melt(id_vars='Variables', value_vars=['MR1', 'MR2', 'MR3'],
```

In [ ]:
```
# Group the data by 'DT' and collect all values into lists (for ANOVA)
grouped_data = data_mt.groupby('Variables')['Value'].apply(list)

# Perform one-way ANOVA
```

```
anova_result = f_oneway(*grouped_data)
anova_result
```

Out[ ]:
```
F_onewayResult(statistic=281.3710259114196, pvalue=7.803091774193629e-28)
```

In [ ]:
```
# Perform Tukey's HSD test (ANOVA - POSTHOC)
tukey_result = pairwise_tukeyhsd(endog=data_mt['Value'], groups=data_mt['Variabl
print(tukey_result.summary())
```

Multiple Comparison of Means - Tukey HSD, FWER=0.05

group1	group2	meandiff	p-adj	lower	upper	reject
CONTROL	NGB00711	118.7433	0.0	92.9121	144.5746	True
CONTROL	NGB00733	62.0333	0.0	36.2021	87.8646	True
CONTROL	NGB00739	68.2933	0.0	42.4621	94.1246	True
CONTROL	NGB00749	-18.0767	0.4207	-43.9079	7.7546	False
CONTROL	NHT0216a	-4.8667	1.0	-30.6979	20.9646	False
CONTROL	NHT0254b	26.5833	0.0389	0.7521	52.4146	True
CONTROL	NHT0259a	121.2033	0.0	95.3721	147.0346	True
CONTROL	NHT0339a	202.23	0.0	176.3988	228.0612	True
CONTROL	NHT0343a	123.5633	0.0	97.7321	149.3946	True
CONTROL	NHT0347	99.7133	0.0	73.8821	125.5446	True
CONTROL	NHT034a	-0.16	1.0	-25.9912	25.6712	False
CONTROL	NHT0355a	286.2533	0.0	260.4221	312.0846	True
CONTROL	NHT0366	92.2667	0.0	66.4354	118.0979	True
CONTROL	NHT356b	52.34	0.0	26.5088	78.1712	True
NGB00711	NGB00733	-56.71	0.0	-82.5412	-30.8788	True
NGB00711	NGB00739	-50.45	0.0	-76.2812	-24.6188	True
NGB00711	NGB00749	-136.82	0.0	-162.6512	-110.9888	True
NGB00711	NHT0216a	-123.61	0.0	-149.4412	-97.7788	True
NGB00711	NHT0254b	-92.16	0.0	-117.9912	-66.3288	True
NGB00711	NHT0259a	2.46	1.0	-23.3712	28.2912	False
NGB00711	NHT0339a	83.4867	0.0	57.6554	109.3179	True
NGB00711	NHT0343a	4.82	1.0	-21.0112	30.6512	False
NGB00711	NHT0347	-19.03	0.343	-44.8612	6.8012	False
NGB00711	NHT034a	-118.9033	0.0	-144.7346	-93.0721	True
NGB00711	NHT0355a	167.51	0.0	141.6788	193.3412	True
NGB00711	NHT0366	-26.4767	0.0403	-52.3079	-0.6454	True
NGB00711	NHT356b	-66.4033	0.0	-92.2346	-40.5721	True
NGB00733	NGB00739	6.26	0.9998	-19.5712	32.0912	False
NGB00733	NGB00749	-80.11	0.0	-105.9412	-54.2788	True
NGB00733	NHT0216a	-66.9	0.0	-92.7312	-41.0688	True
NGB00733	NHT0254b	-35.45	0.0015	-61.2812	-9.6188	True
NGB00733	NHT0259a	59.17	0.0	33.3388	85.0012	True
NGB00733	NHT0339a	140.1967	0.0	114.3654	166.0279	True
NGB00733	NHT0343a	61.53	0.0	35.6988	87.3612	True
NGB00733	NHT0347	37.68	0.0006	11.8488	63.5112	True
NGB00733	NHT034a	-62.1933	0.0	-88.0246	-36.3621	True
NGB00733	NHT0355a	224.22	0.0	198.3888	250.0512	True
NGB00733	NHT0366	30.2333	0.0108	4.4021	56.0646	True
NGB00733	NHT356b	-9.6933	0.9828	-35.5246	16.1379	False
NGB00739	NGB00749	-86.37	0.0	-112.2012	-60.5388	True
NGB00739	NHT0216a	-73.16	0.0	-98.9912	-47.3288	True
NGB00739	NHT0254b	-41.71	0.0001	-67.5412	-15.8788	True
NGB00739	NHT0259a	52.91	0.0	27.0788	78.7412	True
NGB00739	NHT0339a	133.9367	0.0	108.1054	159.7679	True
NGB00739	NHT0343a	55.27	0.0	29.4388	81.1012	True
NGB00739	NHT0347	31.42	0.007	5.5888	57.2512	True
NGB00739	NHT034a	-68.4533	0.0	-94.2846	-42.6221	True
NGB00739	NHT0355a	217.96	0.0	192.1288	243.7912	True
NGB00739	NHT0366	23.9733	0.0904	-1.8579	49.8046	False
NGB00739	NHT356b	-15.9533	0.6137	-41.7846	9.8779	False
NGB00749	NHT0216a	13.21	0.8428	-12.6212	39.0412	False
NGB00749	NHT0254b	44.66	0.0	18.8288	70.4912	True
NGB00749	NHT0259a	139.28	0.0	113.4488	165.1112	True
NGB00749	NHT0339a	220.3067	0.0	194.4754	246.1379	True
NGB00749	NHT0343a	141.64	0.0	115.8088	167.4712	True
NGB00749	NHT0347	117.79	0.0	91.9588	143.6212	True

NGB00749	NHT034a	17.9167	0.4344	-7.9146	43.7479	False
NGB00749	NHT0355a	304.33	0.0	278.4988	330.1612	True
NGB00749	NHT0366	110.3433	0.0	84.5121	136.1746	True
NGB00749	NHT356b	70.4167	0.0	44.5854	96.2479	True
NHT0216a	NHT0254b	31.45	0.0069	5.6188	57.2812	True
NHT0216a	NHT0259a	126.07	0.0	100.2388	151.9012	True
NHT0216a	NHT0339a	207.0967	0.0	181.2654	232.9279	True
NHT0216a	NHT0343a	128.43	0.0	102.5988	154.2612	True
NHT0216a	NHT0347	104.58	0.0	78.7488	130.4112	True
NHT0216a	NHT034a	4.7067	1.0	-21.1246	30.5379	False
NHT0216a	NHT0355a	291.12	0.0	265.2888	316.9512	True
NHT0216a	NHT0366	97.1333	0.0	71.3021	122.9646	True
NHT0216a	NHT356b	57.2067	0.0	31.3754	83.0379	True
NHT0254b	NHT0259a	94.62	0.0	68.7888	120.4512	True
NHT0254b	NHT0339a	175.6467	0.0	149.8154	201.4779	True
NHT0254b	NHT0343a	96.98	0.0	71.1488	122.8112	True
NHT0254b	NHT0347	73.13	0.0	47.2988	98.9612	True
NHT0254b	NHT034a	-26.7433	0.0369	-52.5746	-0.9121	True
NHT0254b	NHT0355a	259.67	0.0	233.8388	285.5012	True
NHT0254b	NHT0366	65.6833	0.0	39.8521	91.5146	True
NHT0254b	NHT356b	25.7567	0.0512	-0.0746	51.5879	False
NHT0259a	NHT0339a	81.0267	0.0	55.1954	106.8579	True
NHT0259a	NHT0343a	2.36	1.0	-23.4712	28.1912	False
NHT0259a	NHT0347	-21.49	0.186	-47.3212	4.3412	False
NHT0259a	NHT034a	-121.3633	0.0	-147.1946	-95.5321	True
NHT0259a	NHT0355a	165.05	0.0	139.2188	190.8812	True
NHT0259a	NHT0366	-28.9367	0.0172	-54.7679	-3.1054	True
NHT0259a	NHT356b	-68.8633	0.0	-94.6946	-43.0321	True
NHT0339a	NHT0343a	-78.6667	0.0	-104.4979	-52.8354	True
NHT0339a	NHT0347	-102.5167	0.0	-128.3479	-76.6854	True
NHT0339a	NHT034a	-202.39	0.0	-228.2212	-176.5588	True
NHT0339a	NHT0355a	84.0233	0.0	58.1921	109.8546	True
NHT0339a	NHT0366	-109.9633	0.0	-135.7946	-84.1321	True
NHT0339a	NHT356b	-149.89	0.0	-175.7212	-124.0588	True
NHT0343a	NHT0347	-23.85	0.0939	-49.6812	1.9812	False
NHT0343a	NHT034a	-123.7233	0.0	-149.5546	-97.8921	True
NHT0343a	NHT0355a	162.69	0.0	136.8588	188.5212	True
NHT0343a	NHT0366	-31.2967	0.0073	-57.1279	-5.4654	True
NHT0343a	NHT356b	-71.2233	0.0	-97.0546	-45.3921	True
NHT0347	NHT034a	-99.8733	0.0	-125.7046	-74.0421	True
NHT0347	NHT0355a	186.54	0.0	160.7088	212.3712	True
NHT0347	NHT0366	-7.4467	0.9986	-33.2779	18.3846	False
NHT0347	NHT356b	-47.3733	0.0	-73.2046	-21.5421	True
NHT034a	NHT0355a	286.4133	0.0	260.5821	312.2446	True
NHT034a	NHT0366	92.4267	0.0	66.5954	118.2579	True
NHT034a	NHT356b	52.5	0.0	26.6688	78.3312	True
NHT0355a	NHT0366	-193.9867	0.0	-219.8179	-168.1554	True
NHT0355a	NHT356b	-233.9133	0.0	-259.7446	-208.0821	True
NHT0366	NHT356b	-39.9267	0.0003	-65.7579	-14.0954	True
