FF_SUMM_ND_ARRAY Examples

back to Fan's Intro Math for Econ, Matlab Examples, or Dynamic Asset Repositories

This is the example vignette for function: **ff_summ_nd_array** from the **MEconTools Package.** This function summarizes policy and value functions over states.

Test FF_SUMM_ND_ARRAY Defaults

Call the function with defaults.

```
ff_summ_nd_array();
```

```
xxx  Summ over (a,z), condi age as cols, kids/marriage as rows  xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
    group     marry     kids    mean_age_18    mean_age_19    mean_age_20    mean_age_21

    _____     _____     ____    _____    _____    _____    _____

      1         0        1        0.53448        0.44448         0.5053        0.52914
      2         1        1         0.4564        0.44512        0.44998        0.51775
      3         0        2        0.52415        0.49903        0.48403        0.44429
      4         1        2        0.49235        0.43684        0.44717        0.45226
      5         0        3         0.4668        0.52676        0.49386        0.51855
      6         1        3        0.47097        0.60345        0.58319        0.46238
      7         0        4        0.55484        0.53601        0.53069        0.49323
      8         1        4         0.5283        0.44091        0.53317        0.51062
```

Test FF_SUMM_ND_ARRAY with Random 2 Dimensional Matrix

Summarize over 6 dimensional array, iteratively change how many dimensions to group over.

First, generate matrix:

```
st_title = "Random 2D dimensional Array Testing Summarizing";
rng(123)
mn_polval = rand(5,4);
bl_print_table = true;
ar_st_stats = ["mean"];
cl_mp_datasetdesc = {};
cl_mp_datasetdesc{1} = containers.Map({'name', 'labval'}, ...
    {'a', linspace(0,1,size(mn_polval,1))});
cl_mp_datasetdesc{2} = containers.Map({'name', 'labval'}, ...
    {'z', linspace(-1,1,size(mn_polval,2))});
disp(mn_polval);
```

```
    0.6965    0.4231    0.3432    0.7380
    0.2861    0.9808    0.7290    0.1825
    0.2269    0.6848    0.4386    0.1755
    0.5513    0.4809    0.0597    0.5316
    0.7195    0.3921    0.3980    0.5318
```

Second, show the entire matrix (no labels):

```
it_aggd = 0;
bl_row = 1;
ff_summ_nd_array(st_title, mn_polval, bl_print_table, ar_st_stats, it_aggd, bl_row);
```

```
xxx  Random 2D dimensional Array Testing Summarizing  xxxxxxxxxxxxxxxxxxxxxxxxxxxx
    group     vardim2    mean_vardim1_1    mean_vardim1_2    mean_vardim1_3    mean_vardim1_4    mean_vardim1_5

    _____     _____    _____    _____    _____    _____    _____

      1          1          0.69647           0.28614           0.22685           0.55131           0.71947
      2          2          0.42311           0.98076           0.68483           0.48093           0.39212
      3          3          0.34318           0.72905           0.43857           0.059678          0.39804
      4          4          0.738             0.18249           0.17545           0.53155           0.53183
```

Third, rotate row and column, and now with labels:

```
it_aggd = 0;
bl_row = 1;
ar_permute = [2,1];
ff_summ_nd_array(st_title, mn_polval, bl_print_table, ar_st_stats, it_aggd, bl_row, ...
    cl_mp_datasetdesc, ar_permute);
```

```
xxx  Random 2D dimensional Array Testing Summarizing  xxxxxxxxxxxxxxxxxxxxxxxxxxxx
    group     a      mean_z__1    mean_z__0_33333    mean_z_0_33333    mean_z_1

    _____    ____    _____    _____    _____    _____

      1        0     0.69647         0.42311           0.34318          0.738
      2      0.25     0.28614         0.98076           0.72905          0.18249
      3      0.5      0.22685         0.68483           0.43857          0.17545
      4      0.75     0.55131         0.48093           0.059678         0.53155
      5        1      0.71947         0.39212           0.39804          0.53183
```

Fourth, dimension one as columns, average over dim 2:

```
it_aggd = 1;
bl_row = 1;
ff_summ_nd_array(st_title, mn_polval, bl_print_table, ar_st_stats, it_aggd, bl_row, ...
    cl_mp_datasetdesc);
```

```
xxx  Random 2D dimensional Array Testing Summarizing  xxxxxxxxxxxxxxxxxxxxxxxxxxxx
    group    x     mean_z__1    mean_z__0_33333    mean_z_0_33333    mean_z_1

    _____    _    _____    _____    _____    _____

      1      1     0.49605         0.59235            0.3937          0.43186
```

Fifth, dimension one as rows, average over dim 2:

```
it_aggd = 1;
bl_row = 0;
ff_summ_nd_array(st_title, mn_polval, bl_print_table, ar_st_stats, it_aggd, bl_row, ...
    cl_mp_datasetdesc);
```

```
xxx  Random 2D dimensional Array Testing Summarizing  xxxxxxxxxxxxxxxxxxxxxxxxxxxx
    group       z        sum       mean       std      coefvari      min        max

    _____    _____    _____    _____    _____    _____    _____    _____

      1          -1      2.4802    0.49605    0.22895     2.1666      0.22685     0.71947
      2      -0.33333    2.9617    0.59235    0.24524     2.4154      0.39212     0.98076
      3       0.33333    1.9685    0.3937     0.23907     1.6468      0.059678    0.72905
      4           1      2.1593    0.43186    0.24575     1.7573      0.17545     0.738
```

Sixth, dimension two as rows, average over dim 1:

```
ar_permute = [2,1];
```

```
it_aggd = 1;
bl_row = 0;
ff_summ_nd_array(st_title, mn_polval, bl_print_table, ar_st_stats, it_aggd, bl_row, ...
    cl_mp_datasetdesc, ar_permute);
```

```
xxx  Random 2D dimensional Array Testing Summarizing  xxxxxxxxxxxxxxxxxxxxxxxxxxx
    group      a       sum      mean        std      coefvari      min         max

    _____    ____    _____    _____    _____    _____    _____    _____

      1         0    2.2007    0.55019    0.19636     2.8019      0.34318      0.738
      2      0.25    2.1784    0.54461    0.37514     1.4518      0.18249     0.98076
      3       0.5    1.5257    0.38143    0.23212     1.6432      0.17545     0.68483
      4      0.75    1.6235    0.40587    0.23269     1.7443     0.059678     0.55131
      5         1    2.0415    0.51036    0.15361     3.3226      0.39212     0.71947
```

Test FF_SUMM_ND_ARRAY with Random 6 Dimensional Matrix

Summarize over 6 dimensional array, iteratively change how many dimensions to group over.

First, generate matrix:

```
st_title = "Random ND dimensional Array Testing Summarizing";
rng(123)
mn_polval = rand(8,7,6,5,4,3);
bl_print_table = true;
ar_st_stats = ["mean"];
```

Second, summarize over the first four dimensions, row group others:

```
it_aggd = 4;
bl_row = 0;
ff_summ_nd_array(st_title, mn_polval, bl_print_table, ar_st_stats, it_aggd, bl_row);
```

```
xxx  Random ND dimensional Array Testing Summarizing  xxxxxxxxxxxxxxxxxxxxxxxxxxx
    group    vardim5    vardim6      sum        mean        std      coefvari       min         max

    _____    _____    _____    _____    _____    _____    _____    _____    _____

      1         1          1       836.78    0.49808    0.29255     1.7026     8.1888e-05     0.99964
      2         2          1       842.15    0.50128    0.28968     1.7305     6.7838e-05     0.99936
      3         3          1       831.45    0.49491    0.28851     1.7154     0.00091373     0.99989
      4         4          1        843.9    0.50232    0.28154     1.7842     0.00012471     0.99731
      5         1          2       838.99     0.4994     0.2911     1.7156     0.00029749     0.99938
      6         2          2       830.81    0.49453    0.28634     1.7271     0.00027113      0.9992
      7         3          2       832.59    0.49559    0.28682     1.7279     0.00035994     0.99936
      8         4          2       820.42    0.48835    0.29032     1.6821     0.00096259     0.99896
      9         1          3       870.56    0.51819    0.29111     1.7801      0.0010616     0.99951
     10         2          3       854.68    0.50874    0.28458     1.7877       0.001884     0.99965
     11         3          3       838.29    0.49898     0.2891      1.726      0.0019192     0.99945
     12         4          3       842.83    0.50169     0.2877     1.7438     0.00016871     0.99963
```

Third, summarize over the first four dimensions, column group 5th, and row group others:

```
it_aggd = 4;
bl_row = 1;
ff_summ_nd_array(st_title, mn_polval, bl_print_table, ["sum"], it_aggd, bl_row);
```

```
xxx  Random ND dimensional Array Testing Summarizing  xxxxxxxxxxxxxxxxxxxxxxxxxxx
    group    vardim6    sum_vardim5_1    sum_vardim5_2    sum_vardim5_3    sum_vardim5_4

    _____    _____    _____    _____    _____    _____
```

```
1          1          836.78              842.15              831.45              843.9
2          2          838.99              830.81              832.59              820.42
3          3          870.56              854.68              838.29              842.83
```

Fourth, summarize over the first five dimensions, column group 6th, no row groups:

```
it_aggd = 5;
bl_row = 1;
ff_summ_nd_array(st_title, mn_polval, bl_print_table, ["mean", "std"], it_aggd, bl_row);
```

```
xxx  Random ND dimensional Array Testing Summarizing  xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
    group     x     mean_vardim6_1     mean_vardim6_2     mean_vardim6_3     std_vardim6_1     std_vardim6_2     std_vardim
    _____     _     _____     _____     _____     _____     _____     _____

     1        1         0.49915            0.49447            0.5069             0.28805           0.28862           0.28816
```

Fifth, summarize over all six dimensions, summary statistics over the entire dataframe:

```
it_aggd = 6;
bl_row = 0;
ff_summ_nd_array(st_title, mn_polval, bl_print_table, ar_st_stats, it_aggd, bl_row);
```

```
xxx  Random ND dimensional Array Testing Summarizing  xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
    group     x      sum       mean       std       coefvari       min          max
    _____     _     _____     _____    _____    _____     _____     _____

     1        1     10083     0.50017    0.28831     1.7349      6.7838e-05     0.99989
```

Test FF_SUMM_ND_ARRAY with Random 7 Dimensional Matrix with All Parameters

Given a random seven dimensional matrix, average over the 2nd, 4th and 5th dimensionals. Show as row groups the 3, 6 and 7th dimensions, and row groups the 1st dimension. Show Coefficient of Variation only.

```
st_title = "avg VALUE 2+4+5th dims. groups 3+6+7th dims, and row groups the 1st dim.";
rng(123)
mn_polval = rand(3,10,2,10,10,2,3);
ar_permute = [2,4,5,1,3,6,7];
bl_print_table = true;
ar_st_stats = ["coefvari"];
it_aggd = 3; % mean over 3 dims
bl_row = 1; % one var for row group
cl_mp_datasetdesc = {};
cl_mp_datasetdesc{1} = containers.Map({'name', 'labval'}, ...
    {'age', [18, 19, 20]});
cl_mp_datasetdesc{2} = containers.Map({'name', 'labval'}, ...
    {'savings', linspace(0,1,10)});
cl_mp_datasetdesc{3} = containers.Map({'name', 'labval'}, ...
    {'borrsave', [-1,+1]});
cl_mp_datasetdesc{4} = containers.Map({'name', 'labval'}, ...
    {'shocka', linspace(-5,5,10)});
cl_mp_datasetdesc{5} = containers.Map({'name', 'labval'}, ...
    {'shockb', linspace(-5,5,10)});
cl_mp_datasetdesc{6} = containers.Map({'name', 'labval'}, ...
    {'marry', [0,1]});
```

4

```matlab
cl_mp_datasetdesc{7} = containers.Map({'name', 'labval'}, ...
    {'region', [1,2,3]});
% call function
ff_summ_nd_array(st_title, mn_polval, bl_print_table, ar_st_stats, it_aggd, bl_row, cl_mp_datas
```

xxx avg VALUE 2+4+5th dims. groups 3+6+7th dims, and row groups the 1st dim. xxxxxxxxxxxxxxxxxxxxxxxxxxxxx

group	borrsave	marry	region	cv_age_18	cv_age_19	cv_age_20
1	-1	0	1	1.7607	1.7534	1.7065
2	1	0	1	1.6566	1.7501	1.7042
3	-1	1	1	1.6608	1.7658	1.7291
4	1	1	1	1.756	1.7479	1.7606
5	-1	0	2	1.7314	1.7506	1.786
6	1	0	2	1.7347	1.728	1.738
7	-1	1	2	1.7811	1.755	1.7568
8	1	1	2	1.7445	1.7398	1.7746
9	-1	0	3	1.7025	1.7286	1.69
10	1	0	3	1.74	1.7549	1.7356
11	-1	1	3	1.7147	1.7287	1.7341
12	1	1	3	1.7919	1.7313	1.7452