



```
NEOS Server Version 5.0
Job#       : 4072297
Password   : MnYXNSBy
Solver     : minco:Knitro:AMPL
Start      : 2015-12-11 15:25:33
End        : 2015-12-11 15:25:44
Host       : NEOS HTCondor Pool
```

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This information is provided without any express or implied warranty. In particular, there is no warranty of any kind concerning the fitness of this information for any particular purpose.

```
amplin, line 41 (offset 1224):
    Caution: 0-dimensional slice
context: sum {(b,p) in >>> B2p} <<<
```

```
amplin, line 59 (offset 1677):
    C
Presolve eliminates 420 constraints and 150 variables.
Adjusted problem:
255 variables:
    15 binary variables
    240 nonlinear variables
226 constraints; 578 nonzeros
    195 nonlinear constraints
    31 linear constraints
    16 equality constraints
    210 inequality constraints
15 objectives, all linear; 75 nonzeros.
```

KNITRO 9.1.1: KNITRO: Number of threads = 1

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```
=====
    Academic License (time limited)
        KNITRO 9.1.1
        Ziena Optimization
=====
```

```
KNITRO changing mip_method from AUTO to 1.
KNITRO changing mip_rootalg from AUTO to 1.
KNITRO changing mip_lpalg from AUTO to 3.
KNITRO changing mip_branchrule from AUTO to 2.
KNITRO changing mip_selectrule from AUTO to 2.
KNITRO changing mip_rounding from AUTO to 3.
KNITRO changing mip_heuristic from AUTO to 1.
KNITRO changing mip_pseudoinit from AUTO to 1.
```

Problem Characteristics

Objective goal: Maximize

```

Number of variables:      255
    bounded below:        60
    bounded above:        0
    bounded below and above: 195
    fixed:                 0
    free:                  0
Number of binary variables: 15
Number of integer variables: 0
Number of constraints:    226
    linear equalities:     16
    nonlinear equalities:  0
    linear inequalities:   15
    nonlinear inequalities: 195
    range:                 0
Number of nonzeros in Jacobian: 578
Number of nonzeros in Hessian: 240

```

No start point provided -- KNITRO computing one.

KNITRO detected 0 GUB constraints

KNITRO derived 0 knapsack covers after examining 15 constraints

KNITRO solving root node relaxation

KNITRO MIP using Branch and Bound method

Node	Left	Iinf	Objective	Best Relaxatn	Best Incumbent
1	0	14	3.280000e+03	3.280000e+03	
* 3	2				3.280000e+03
3	4	13	3.280000e+03	3.280000e+03	3.280000e+03

EXIT: Optimal solution found.

Final Statistics for MIP

```

Final objective value      = 3.2799999956907e+03
Final integrality gap (abs / rel) = 4.31e-07 / 1.31e-10 ( 0.00%)
# of nodes processed       = 3
# of subproblems processed = 4
Total program time (secs)  = 0.04926 ( 0.048 CPU time)
Time spent in evaluations (secs) = 0.00401

```

Locally optimal solution.

objective 3280; integrality gap 4.31e-07

3 nodes; 4 subproblem solves

suffix incumbent OUT;

suffix relaxbnd OUT;

Objective = utility[1]

```

:      Xbmp      Ybmp      :=
1  1  1      70      0.263475
1  1  2      0      11.3258
1  1  3      0      11.3454
1  2  1     230      0.0845136
1  2  2      0      2.89073
1  2  3      0      2.87633
1  3  1     100      1.50256
1  3  2      0      1.15831
1  3  3      0      1.14716
1  4  1     2.23397e-12  0.380306
1  4  2      0      0.383493
1  4  3      0      0.383341
2  1  1      0      8.99285
2  1  2     15.4282     10.12
2  1  3      0      8.99589
2  2  1      0      2.2733

```

2	2	2	84.7572	2.53223
2	2	3	0	2.2724
2	3	1	0	0.911332
2	3	2	36.8896	0.929084
2	3	3	0	0.909236
2	4	1	0	0.301948
2	4	2	5.03305	0.301105
2	4	3	0	0.30198
3	1	1	0	9.00769
3	1	2	0	8.99605
3	1	3	27.1569	10.0308
3	2	1	0	2.29076
3	2	2	0	2.27477
3	2	3	132.257	2.42854
3	3	1	0	0.909036
3	3	2	0	0.916248
3	3	3	91.7177	0.93111
3	4	1	0	0.301907
3	4	2	0	0.301905
3	4	3	7.39212	0.300716
4	1	1	27.8145	11.6025
4	1	2	0	10.4041
4	1	3	0	10.3906
4	2	1	136.658	2.7739
4	2	2	0	2.6322
4	2	3	0	2.63905
4	3	1	93.007	1.07847
4	3	2	0	1.05441
4	3	3	0	1.0521
4	4	1	7.38604	0.348615
4	4	2	0	0.350104
4	4	3	0	0.350336
5	1	1	0	25.7087
5	1	2	7.63229e-10	25.0515
5	1	3	0	25.6501
5	2	1	0	6.51994
5	2	2	1.03379e-08	6.31893
5	2	3	0	6.52076
5	3	1	0	2.63983
5	3	2	22.7548	3.79273
5	3	3	0	2.64126
5	4	1	0	0.877174
5	4	2	7.72378	0.996754
5	4	3	0	0.87673
6	1	1	0	25.6431
6	1	2	0	25.7004
6	1	3	5.46548e-10	25.003
6	2	1	0	6.52213
6	2	2	0	6.51928
6	2	3	1.05726e-08	6.3176
6	3	1	0	2.64273
6	3	2	0	2.64038
6	3	3	22.4869	3.71439
6	4	1	0	0.877615
6	4	2	0	0.879104
6	4	3	13.7586	1.05368
7	1	1	9.58421e-10	27.1382
7	1	2	0	27.9965
7	1	3	0	27.9556
7	2	1	1.0825e-08	6.89851
7	2	2	0	7.11343
7	2	3	0	7.11996
7	3	1	22.4237	4.04314
7	3	2	0	2.89219
7	3	3	0	2.86871
7	4	1	13.8706	1.15388
7	4	2	0	0.9603
7	4	3	0	0.958131
8	1	1	0	23.3591
8	1	2	9.64731	28.5661
8	1	3	0	23.4186

8	2	1	0	5.93635
8	2	2	19.4865	6.65571
8	2	3	0	5.93677
8	3	1	0	2.39533
8	3	2	10.0738	2.46135
8	3	3	0	2.40874
8	4	1	0	0.80038
8	4	2	2.76216	0.8059
8	4	3	0	0.800152
9	1	1	0	25.7104
9	1	2	0	25.6642
9	1	3	8.98975	31.7367
9	2	1	0	6.52587
9	2	2	0	6.52174
9	2	3	15.0862	7.22409
9	3	1	0	2.63254
9	3	2	0	2.63725
9	3	3	8.58357	2.706
9	4	1	0	0.876727
9	4	2	0	0.876968
9	4	3	2.63965	0.885087
10	1	1	11.261	32.0956
10	1	2	0	25.7165
10	1	3	0	25.7186
10	2	1	13.586	7.07587
10	2	2	0	6.52045
10	2	3	0	6.5308
10	3	1	9.0886	2.69718
10	3	2	0	2.63578
10	3	3	0	2.64016
10	4	1	3.07114	0.883626
10	4	2	0	0.876665
10	4	3	0	0.876853
11	1	1	0	44.138
11	1	2	1.64142e-09	43.155
11	1	3	0	44.1386
11	2	1	0	11.2271
11	2	2	1.02533e-08	10.9651
11	2	3	0	11.223
11	3	1	0	4.55552
11	3	2	33.6813	6.56974
11	3	3	0	4.56827
11	4	1	0	1.51857
11	4	2	4.82956	1.59997
11	4	3	0	1.51762
12	1	1	0	46.0163
12	1	2	0	46.0129
12	1	3	1.66811e-09	44.8948
12	2	1	0	11.6514
12	2	2	0	11.6656
12	2	3	1.02925e-08	11.4242
12	3	1	0	4.74941
12	3	2	0	4.75739
12	3	3	33.9454	6.83007
12	4	1	0	1.58061
12	4	2	0	1.5799
12	4	3	4.84616	1.66155
13	1	1	7.78256e-10	45.7129
13	1	2	0	46.4807
13	1	3	0	46.458
13	2	1	9.68144e-09	11.5563
13	2	2	0	11.7729
13	2	3	0	11.7891
13	3	1	38.8801	6.85152
13	3	2	0	4.79828
13	3	3	0	4.79547
13	4	1	7.02075	1.69004
13	4	2	0	1.59871
13	4	3	0	1.59499
14	1	1	0	44.1775
14	1	2	7.93477	53.6589

```
14 1 3      0      44.1542
14 2 1      0      11.1961
14 2 2    18.6701    12.978
14 2 3      0      11.2049
14 3 1      0      4.55282
14 3 2    8.24386    4.6789
14 3 3      0      4.5515
14 4 1      0      1.51812
14 4 2    2.21515    1.53796
14 4 3      0      1.52338
15 1 1      0      64.9333
15 1 2      0      64.9367
15 1 3    5.37917e-10  55.365
15 2 1      0      16.4245
15 2 2      0      16.4239
15 2 3    1.68912e-08  15.8141
15 3 1      0      6.65517
15 3 2      0      6.63666
15 3 3    25.8278    9.83236
15 4 1      0      2.24113
15 4 2      0      2.23985
15 4 3    2.95048    2.31266
;
```

```
deltabp [*,*]
:      1  2  3      :=
1      1  0  0
2      0  1  0
3      0  0  1
4      1  0  0
5      0  1  0
6      0  0  1
7      1  0  0
8      0  1  0
9      0  0  1
10     1  0  0
11     0  1  0
12     0  0  1
13     1  0  0
14     0  1  0
15     0  0  1
;
```

