**MLRC\_ILP (cosine2.dot)**

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------------- FILES -------------

1: hal.dot

2: fir1.dot

3: cosine1.dot

4: cosine2.dot

5: Any other .dot file

========================================

Enter the file option: 4

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------------- ALGORITHMS -------------

1: MLRC\_ILP

2: MRLC\_ILP

3: MLRC\_List

4: MRLC\_List

========================================

Enter Option: 1

========================================

MLRC\_ILP: Minimum Latency: 151

Nodes = ['56', '54', '42', '60', '62', '64', '66', '68', '83', '80', '81', '53', '24', '26', '21', '48', '0', '46', '44', '28', '29', '40', '82', '3', '6', '9', '52', '77', '76', '75', '38', '73', '72', '71', '70', '79', '78', '12', '15', '58', '18', '31', '30', '51', '36', '34', '33', '55', '74', '32', '57', '50']

Start\_Time\_List = [21, 112, 73, 43, 43, 32, 32, 41, 152, 84, 93, 103, 1, 12, 1, 73, 1, 23, 23, 12, 42, 73, 102, 1, 1, 1, 103, 123, 114, 123, 82, 82, 73, 73, 52, 93, 132, 1, 12, 32, 1, 62, 42, 112, 82, 53, 12, 32, 82, 62, 21, 73]

Latest\_Start\_Time\_List = [71, 112, 82, 82, 91, 82, 91, 82, 152, 132, 132, 112, 42, 12, 42, 91, 1, 82, 91, 12, 42, 91, 132, 51, 1, 1, 121, 132, 132, 132, 82, 121, 121, 112, 82, 132, 132, 31, 42, 62, 42, 62, 51, 121, 91, 62, 71, 71, 112, 71, 62, 82]

Mobility\_Original = [50, 0, 9, 39, 48, 50, 59, 41, 0, 48, 39, 9, 41, 0, 41, 18, 0, 59, 68, 0, 0, 18, 30, 50, 0, 0, 18, 9, 18, 9, 0, 39, 48, 39, 30, 39, 0, 30, 30, 30, 41, 0, 9, 9, 9, 9, 59, 39, 30, 9, 41, 9]

Mobility\_Modified = [51, 1, 10, 40, 49, 51, 60, 42, 1, 49, 40, 10, 42, 1, 42, 19, 1, 60, 69, 1, 1, 19, 31, 51, 1, 1, 19, 10, 19, 10, 1, 40, 49, 40, 31, 40, 1, 31, 31, 31, 42, 1, 10, 10, 10, 10, 60, 40, 31, 10, 42, 10]

Mobility\_Cumulated = [51, 52, 62, 102, 151, 202, 262, 304, 305, 354, 394, 404, 446, 447, 489, 508, 509, 569, 638, 639, 640, 659, 690, 741, 742, 743, 762, 772, 791, 801, 802, 842, 891, 931, 962, 1002, 1003, 1034, 1065, 1096, 1138, 1139, 1149, 1159, 1169, 1179, 1239, 1279, 1310, 1320, 1362, 1372]

Nodes associated with Operations = [['42', '60', '62', '64', '66', '68', '26', '48', '46', '44', '28', '40', '38', '70', '36', '50'], ['54', '53', '24', '21', '29', '71', '15', '58', '18', '31', '34', '74', '57'], ['56', '3', '6', '9', '52', '73', '72', '12', '30', '51', '33', '55', '32'], ['80', '81', '82', '77', '76', '75', '79', '78']]

Unique Resource Types = ['mul', 'add', 'sub', 'exp']

================================================================================

Enter the number of instances of Multiplier: 14

Enter the number of instances of Adder: 30

Enter the number of instances of Subtracter: 3

Enter the number of instances of Exponent: 4

OBJECTIVE FUNCTION = [21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 0, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 0, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 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69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 0, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82]

set\_int: Column 0 out of range

Model name: '' - run #1

Objective: Minimize(R0)

SUBMITTED

Model size: 473 constraints, 1372 variables, 27866 non-zeros.

Sets: 0 GUB, 0 SOS.

Using DUAL simplex for phase 1 and PRIMAL simplex for phase 2.

The primal and dual simplex pricing strategy set to 'Devex'.

Relaxed solution 2326 after 60 iter is B&B base.

Feasible solution 2326 after 60 iter, 0 nodes (gap 0.0%)

Optimal solution 2326 after 60 iter, 0 nodes (gap 0.0%).

Excellent numeric accuracy ||\*|| = 4.26326e-014

MEMO: lp\_solve version 5.5.2.0 for 32 bit OS, with 64 bit REAL variables.

In the total iteration count 60, 0 (0.0%) were bound flips.

There were 2 refactorizations, 0 triggered by time and 2 by density.

... on average 30.0 major pivots per refactorization.

The largest [LUSOL v2.2.1.0] fact(B) had 1564 NZ entries, 1.0x largest basis.

The maximum B&B level was 1, 0.0x MIP order, 1 at the optimal solution.

The constraint matrix inf-norm is 152, with a dynamic range of 152.

Time to load data was 0.567 seconds, presolve used 0.053 seconds,

... 0.050 seconds in simplex solver, in total 0.670 seconds.

====================================================================================================

Objective = 2326.0

Variables = [1.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 1.0, 1.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 1.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 1.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 1.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 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Constraints = [1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 0.9999999999999999, 1.0000000000000002, 1.0, 1.0000000000000002, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 0.9999999999999999, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0000000000000002, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 10.999999999999998, 10.999999999999998, 11.0, 11.000000000000002, 20.000000000000004, 20.000000000000004, 30.0, 30.0, 52.0, 11.0, 20.000000000000007, 20.0, 49.99999999999999, 19.999999999999993, 11.0, 80.0, 29.999999999999986, 11.0, 49.99999999999999, 20.0, 30.00000000000003, 39.00000000000003, 10.999999999999957, 31.0, 20.0, 31.0, 20.0, 20.0, 19.999999999999996, 41.0, 29.999999999999993, 20.000000000000014, 40.999999999999986, 29.999999999999993, 11.000000000000014, 11.0, 11.0, 10.999999999999979, 80.0, 30.0, 20.0, 38.999999999999986, 20.0, 20.0, 11.000000000000004, 30.0, 41.0, 20.0, 11.0, 29.999999999999986, 41.0, 11.000000000000028, 28.999999999999986, 38.000000000000014, 28.999999999999986, 50.000000000000014, 67.99999999999999, 59.000000000000014, 59.000000000000014, 2.0, 2.0, 2.0, 2.0, 2.0, 2.0, 2.0, 2.0, 2.0, 2.0, 2.0, 4.0, 4.0, 4.0, 4.0, 4.0, 4.0, 4.0, 4.0, 4.0, 6.0, 6.0, 6.0, 6.0, 6.0, 6.0, 6.0, 6.0, 6.0, 7.0, 5.0, 7.0, 7.0, 7.0, 7.0, 7.0, 7.0, 7.0, 7.0, 7.0, 8.0, 6.0, 6.0, 6.0, 6.0, 6.0, 6.0, 6.0, 6.0, 6.0, 4.0, 4.0, 4.0, 4.0, 4.0, 4.0, 4.0, 4.0, 4.0, 3.0, 3.0, 5.0, 5.0, 5.0, 5.0, 5.0, 5.0, 5.0, 5.0, 5.0, 6.0, 6.0, 6.0, 6.0, 6.0, 6.0, 6.0, 6.0, 6.0, 6.0, 3.0, 3.0, 3.0, 3.0, 3.0, 3.0, 3.0, 3.0, 3.0, 3.0, 3.0, 4.0, 4.0, 4.0, 4.0, 4.0, 4.0, 4.0, 4.0, 4.0, 2.0, 2.0, 2.0, 2.0, 2.0, 2.0, 2.0, 2.0, 2.0, 2.0, 2.0, 2.0, 2.0, 2.0, 2.0, 2.0, 2.0, 2.0, 2.0, 2.0, 1.0, 2.0, 2.0, 2.0, 2.0, 2.0, 2.0, 2.0, 2.0, 2.0, 2.0, 1.0000000000000002, 2.0, 2.0, 2.0, 2.0, 2.0, 2.0, 2.0, 2.0, 2.0, 2.0, 2.0, 2.0, 2.0, 2.0, 2.0, 2.0, 2.0, 2.0, 2.0, 2.0, 2.0, 2.0, 2.0, 2.0, 2.0, 2.0, 2.0, 2.0, 2.0, 2.0, 2.0, 2.0, 2.0, 2.0, 2.0, 2.0, 2.0, 2.0, 2.0, 2.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 0.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 2.0, 3.0, 3.0, 3.0, 3.0, 3.0, 3.0, 3.0, 3.0, 3.0, 3.0, 3.0, 2.0, 2.0, 2.0, 2.0, 2.0, 2.0, 2.0, 2.0, 2.0, 3.0, 3.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 2.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 2.0, 2.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 2.0, 2.0, 1.0000000000000002, 1.0000000000000002, 1.0000000000000002, 1.0000000000000002, 1.0000000000000002, 1.0000000000000002, 1.0000000000000002, 1.0000000000000002, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 3.0, 3.0, 3.0, 3.0, 3.0, 3.0, 3.0, 3.0, 3.0, 4.0, 4.0, 3.0, 3.0, 3.0, 3.0, 3.0, 3.0, 3.0, 3.0, 3.0, 1.0, 2.0, 2.0, 2.0, 2.0, 2.0, 2.0, 2.0, 2.0, 0.9999999999999999, 3.0, 3.0, 3.0, 3.0, 3.0, 3.0, 3.0, 3.0, 3.0, 4.0]

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Minimum Latency = 151