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# Optimal Binary Search Trees

Dynamic programming.

Operation Research.

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The goal of the maximum weight independent set problem (MWIS) is to compute, for a given set of geometric objects with certain weights, a subset of disjoint (non-overlapping) objects with maximum total weight.

There is a PTAS (polynomial-time algorithm scheme) for MWIS in disk graphs, provided that a disk representation of the graph is given. The running-time for achieving approximation ratio  $1 + \epsilon$  is  $n^{O(1/\epsilon^2)}$  for a disk graph with  $n$  disks.

Details:

- Executed on : SEG OUT 13 13:06:29 BRT 2014.
- Number of disks : 13.
- Execution time : 0,000619 SECONDS.
- Memory required : 2044 BYTES.

Nodes

	Name	Probabilities
<b>1</b>	1	1,65
<b>2</b>	10	1,98
<b>3</b>	11	3,00
<b>4</b>	12	2,47
<b>5</b>	13	1,98
<b>6</b>	2	2,81
<b>7</b>	3	2,96
<b>8</b>	4	2,41
<b>9</b>	5	3,16
<b>10</b>	6	2,46
<b>11</b>	7	1,98
<b>12</b>	8	2,96
<b>13</b>	9	2,47

Table 1: Nodes probabilities.

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# Execution

	1	2	3	4
0	0,00	340282346638528859811704183484516925440,00	340282346638528859811704183484516925440,00	340282346638528859811704183484516925440,00
1		0,00	340282346638528859811704183484516925440,00	340282346638528859811704183484516925440,00
2			0,00	340282346638528859811704183484516925440,00
3				0,00
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				

Table 2: Table A.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
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
2			0	0	0	0	0	0	0	0	0	0	0	0
3				0	0	0	0	0	0	0	0	0	0	0
4					0	0	0	0	0	0	0	0	0	0
5						0	0	0	0	0	0	0	0	0
6							0	0	0	0	0	0	0	0
7								0	0	0	0	0	0	0
8									0	0	0	0	0	0
9										0	0	0	0	0
10											0	0	0	0
11												0	0	0
12													0	0
13														0

Table 3: Table R.

# Analysis

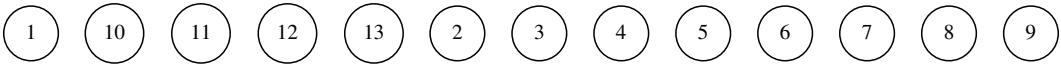


Figure 1: Optimal search tree.

## Digest

- Total nodes : 13.
- Levels : 1.
- Expected cost : 340282346638528859811704183484516925440,00.