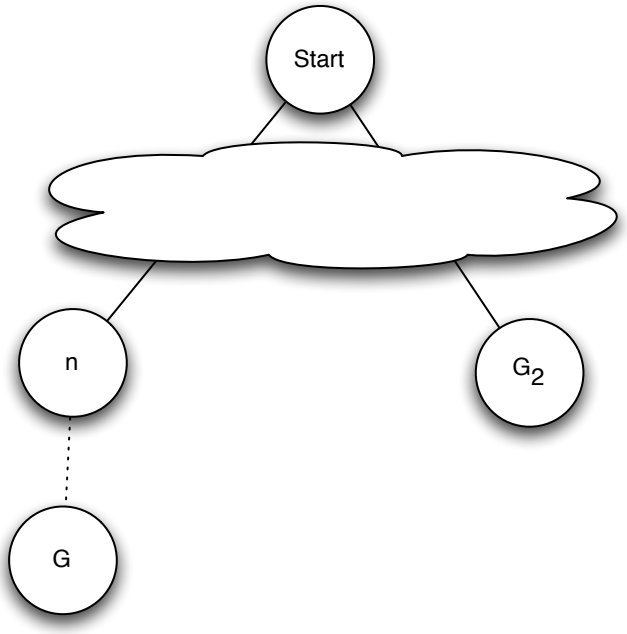
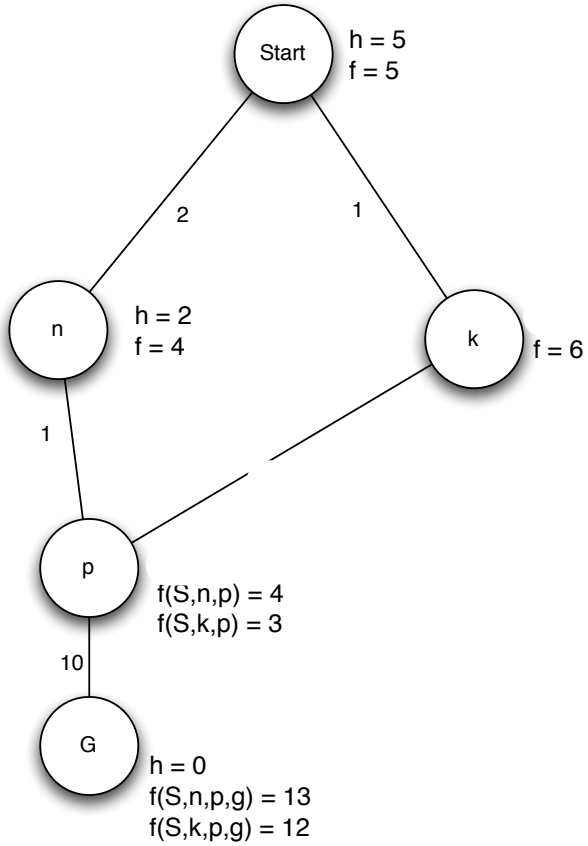
Informed [Heuristic] Search

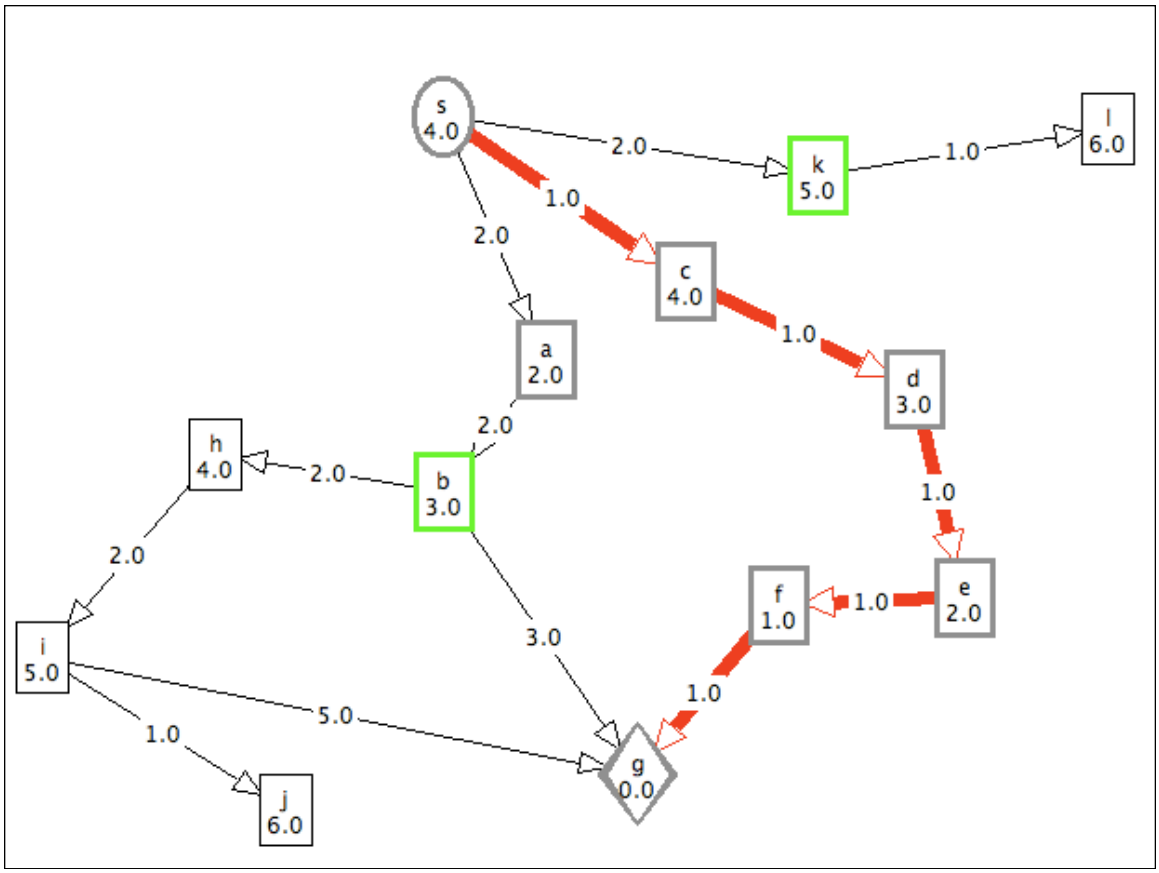
Heuristic: "A rule of thumb, simplification, or educated guess that reduces or limits the search for solutions in domains that are difficult and poorly understood."


Start
n
G_2
G

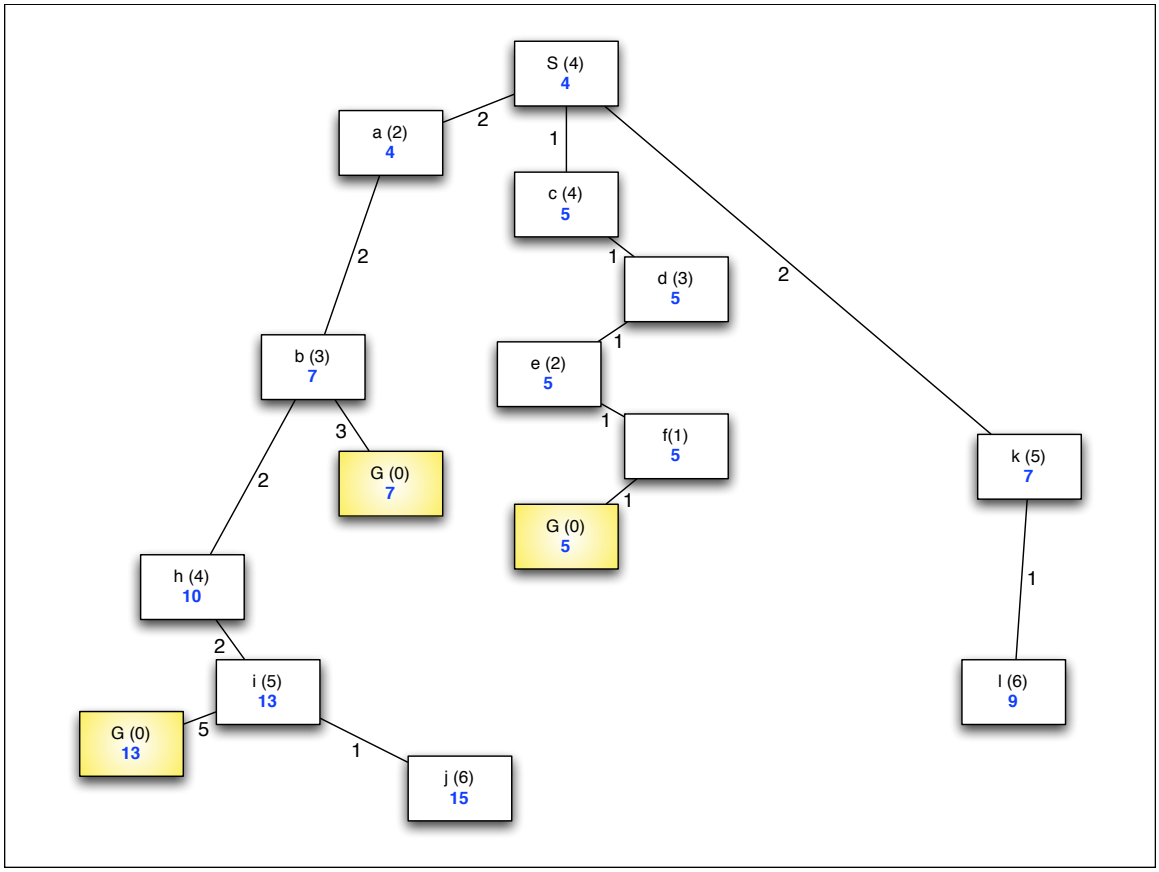
3


Start
h = 5
f = 5
2
1
n
h = 2
f = 4
k
f = 6
1
p
f(S,n,p) = 4
f(S,k,p) = 3
10
G
h = 0
f(S,n,p,g) = 13
f(S,k,p,g) = 12

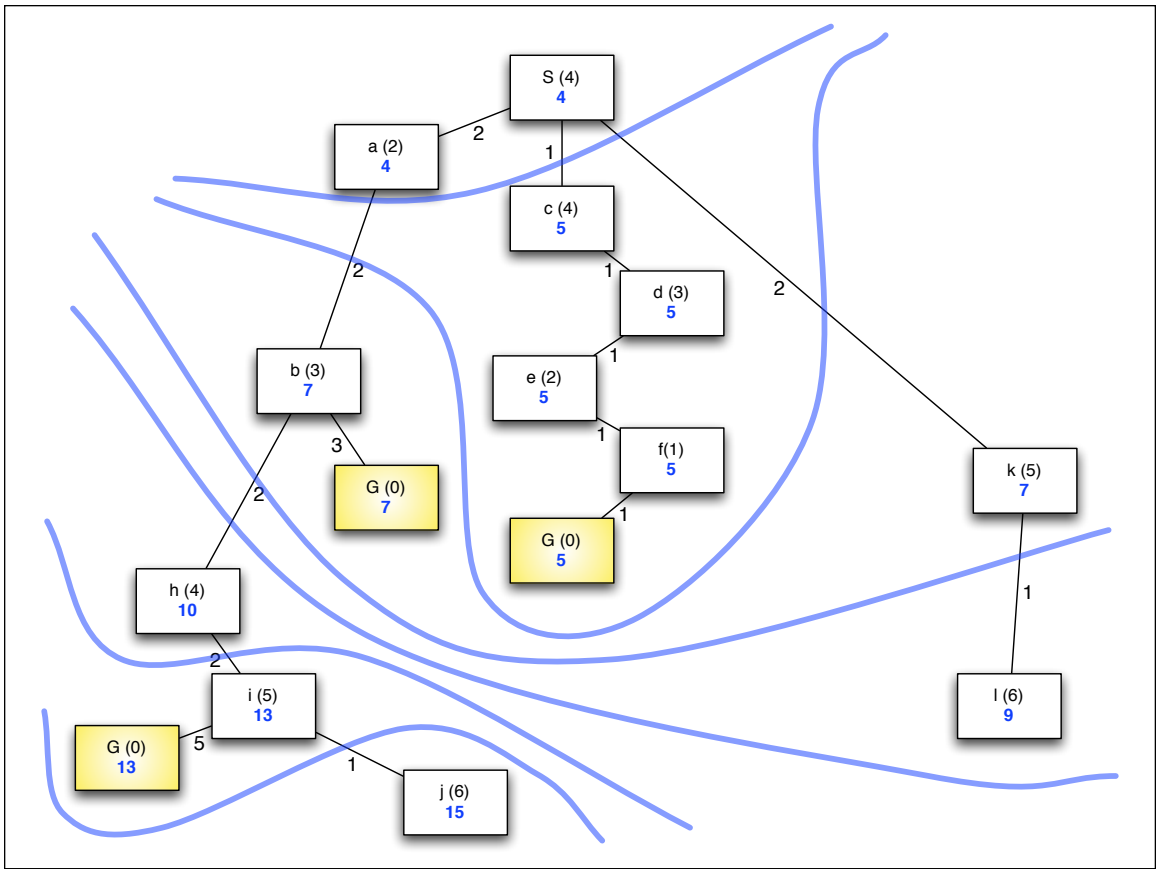
4


s
4.0
k
5.0
l
6.0
c
4.0
a
2.0
d
3.0
h
4.0
b
3.0
e
2.0
f
1.0
i
5.0
g
0.0
j
6.0
2.0
1.0
1.0
2.0
1.0
2.0
2.0
1.0
2.0
1.0
3.0
1.0
5.0
1.0

5


S (4)
4
a (2)
4
c (4)
5
d (3)
5
b (3)
7
e (2)
5
f(1)
5
G (0)
7
G (0)
5
k (5)
7
h (4)
10
i (5)
13
G (0)
13
j (6)
15
l (6)
9
2
1
2
1
2
1
3
1
2
1
1
2
5
1

6



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Local Search

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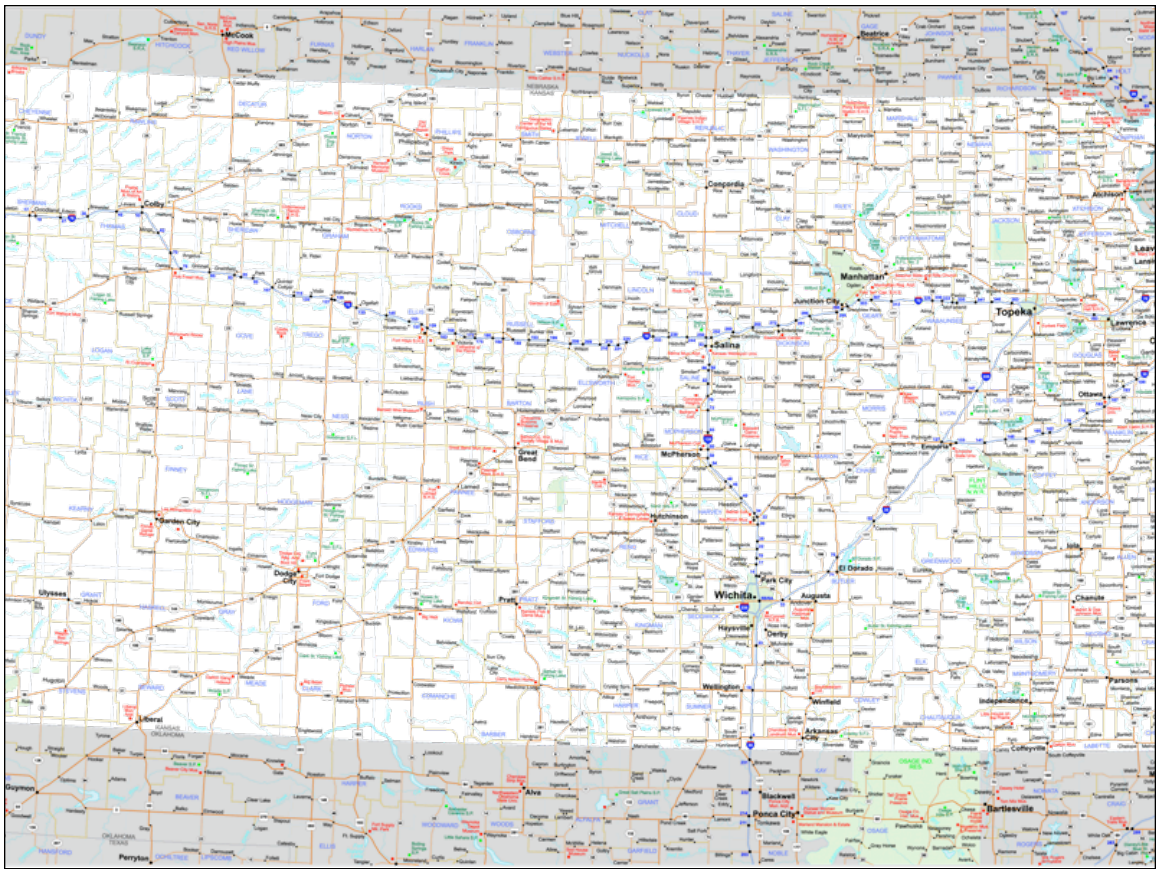
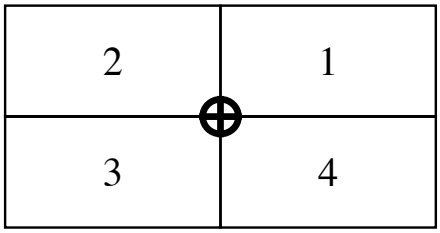
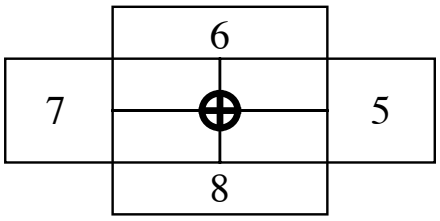

McCook
Colby
Concordia
Manhattan
Junction City
Topeka
Lawrence
Salina
McPherson
Great Bend
Hutchinson
Garden City
Dodge City
Ulysses
Pratt
Wichita
Park City
El Dorado
Augusta
Haysville
Derby
Wellington
Winfield
Arkansas City
Coffeyville
Independence
Parsons
Liberal
Guymon
Perryton
Alva
Blackwell
Ponca City
Bartlesville
Beatrice

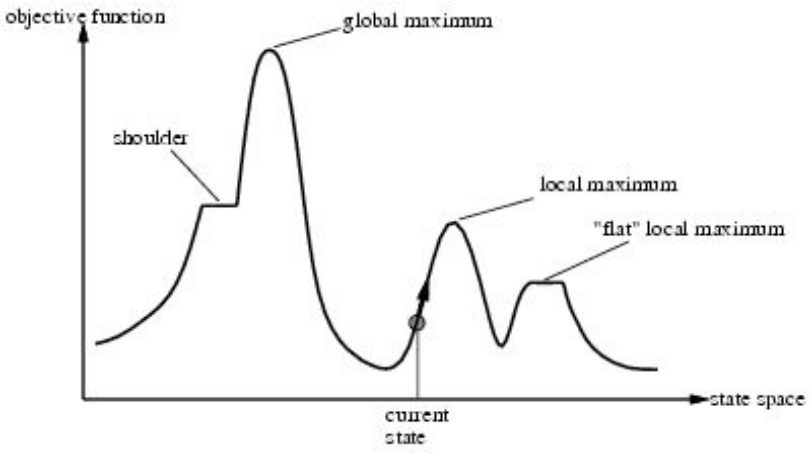
9

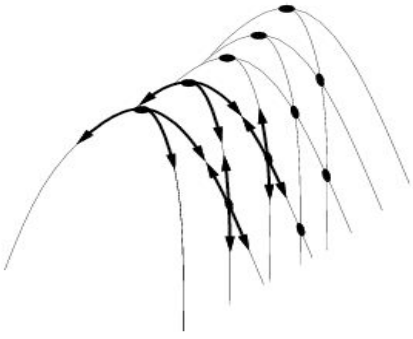
10


2
1
3
4


6
7
5
8

11


objective function
global maximum
shoulder
local maximum
"flat" local maximum
state space
current
state



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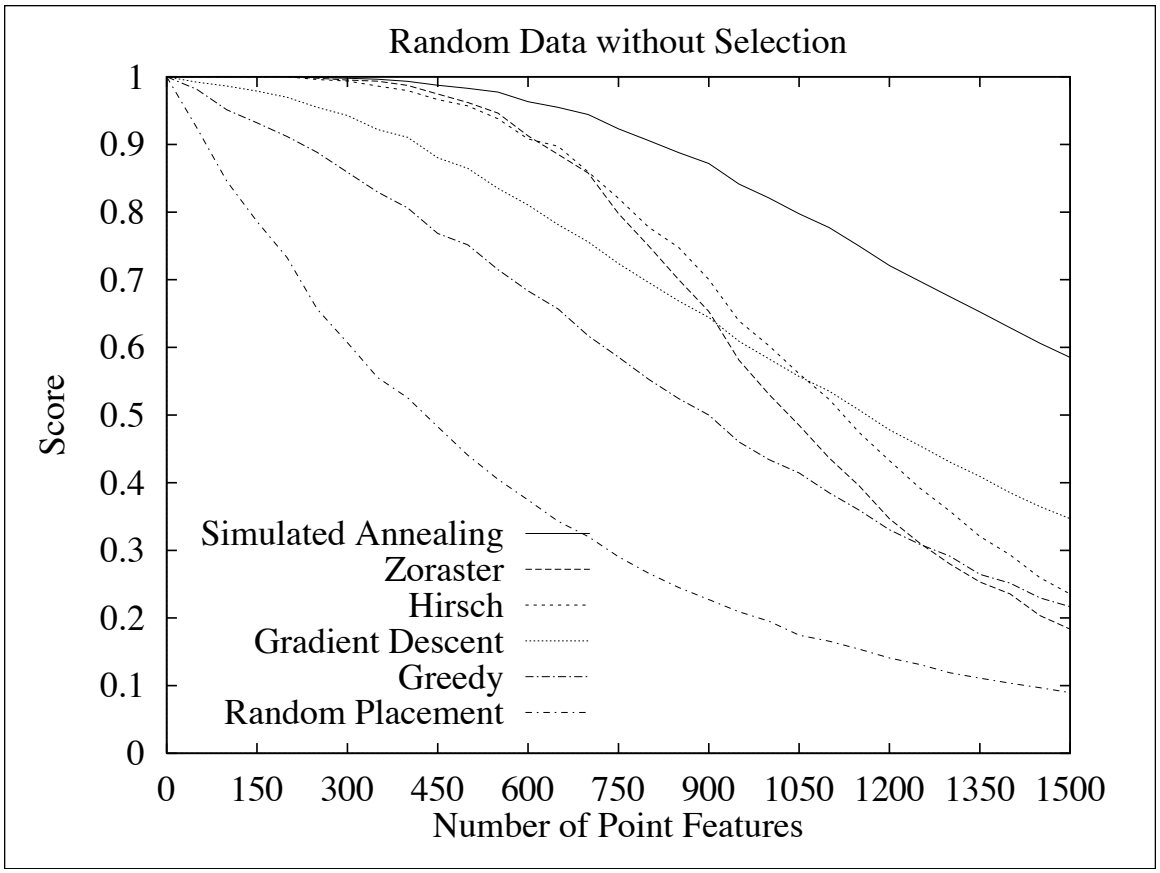
Random Data without Selection
Score
Number of Point Features
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
0
150
300
450
600
750
900
1050
1200
1350
1500
Simulated Annealing
Zoraster
Hirsch
Gradient Descent
Greedy
Random Placement

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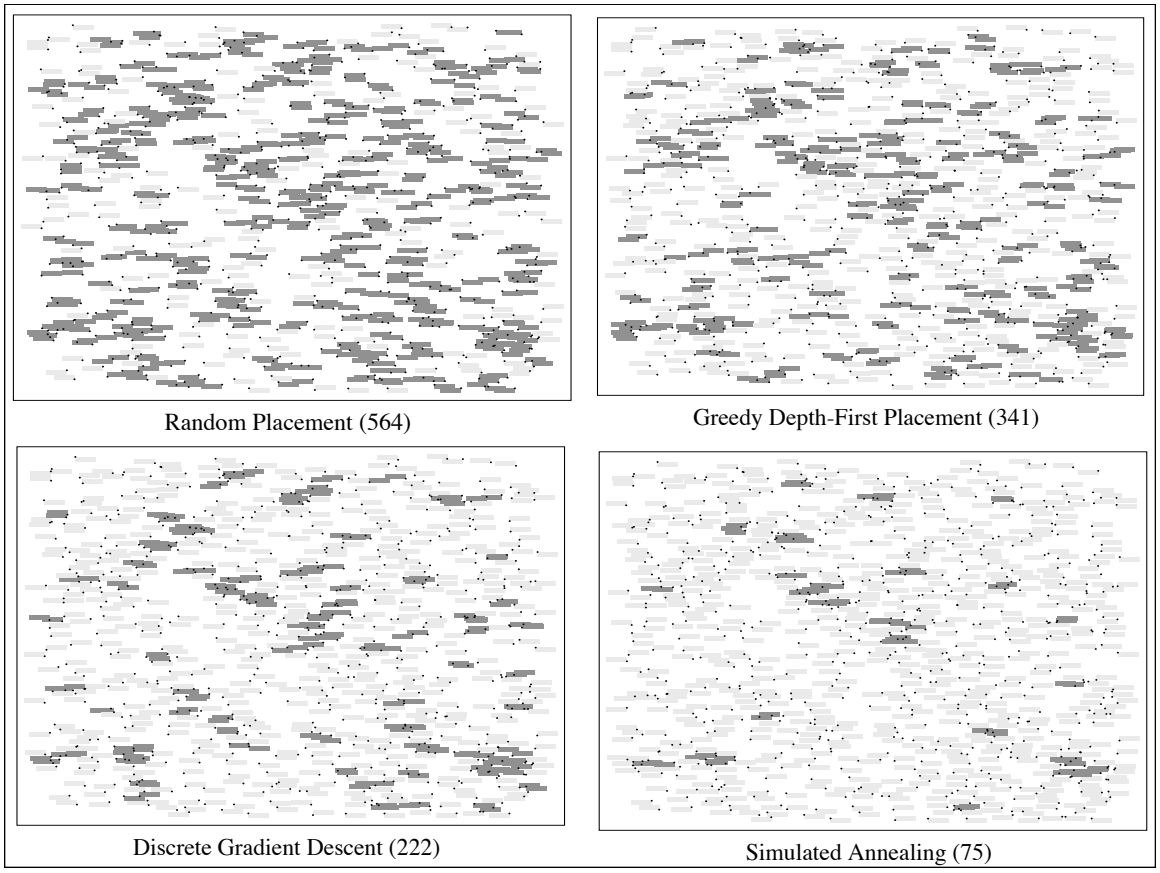
Random Placement (564)
Greedy Depth-First Placement (341)
Discrete Gradient Descent (222)
Simulated Annealing (75)

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