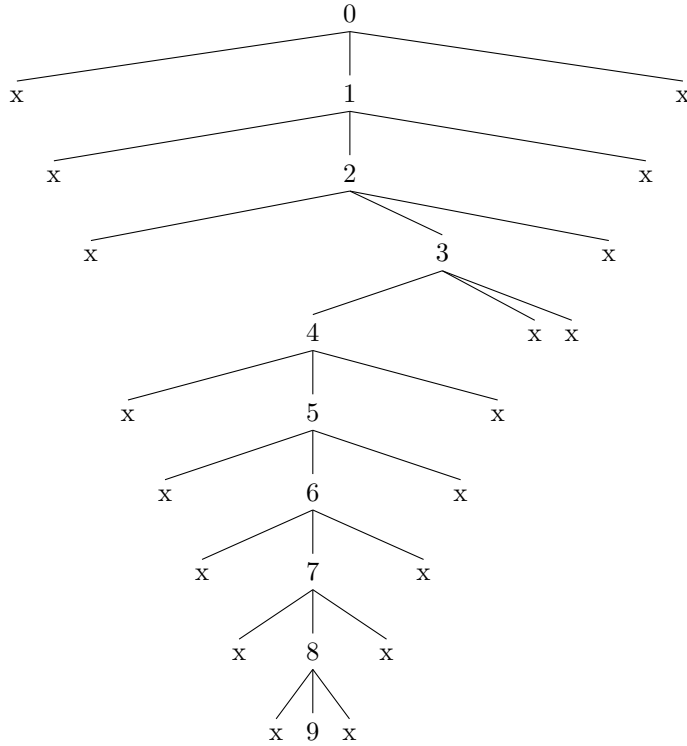
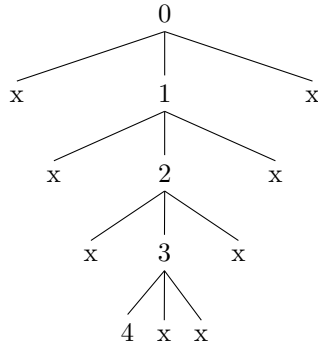


1 ternary angle tree (leafmin) (N=10 R=3 theta=0.124355)



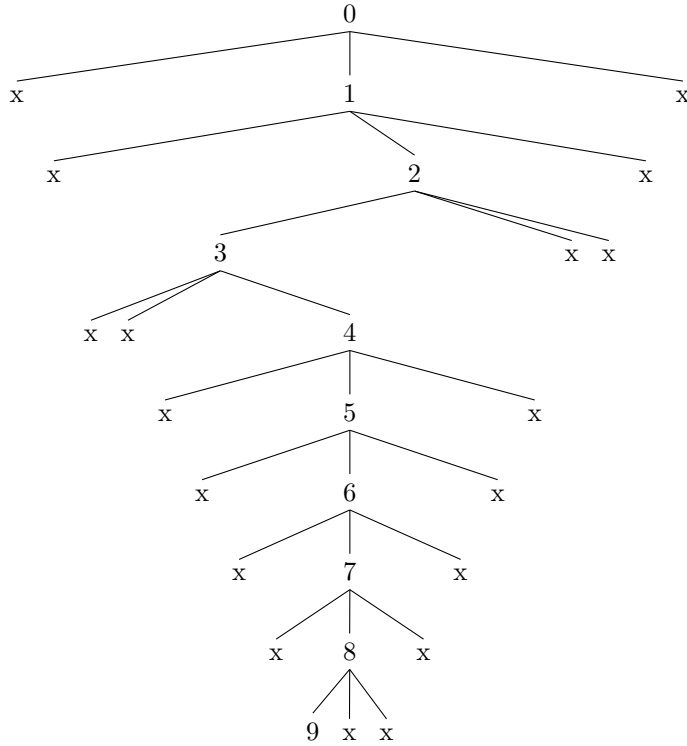
$i$	$br$	$theta$	$-u(i)$	$a(i)$	$theta'$
0	1	0.124355	0	0.785398	0.124355
1	1	0.124355	0	0.463648	0.124355
2	1	0.124355	0	0.244979	0.124355
3	0	0.124355	-1	0.124355	0.000000
4	1	0.000000	0	0.062419	0.000000
5	1	0.000000	0	0.031240	0.000000
6	1	0.000000	0	0.015624	0.000000
7	1	0.000000	0	0.007812	0.000000
8	1	0.000000	0	0.003906	0.000000

## 2 ternary angle tree (globalmin) (N=10 R=3 theta=0.124355)



$i$	$br$	$theta$	$-u(i)$	$a(i)$	$theta'$
0	1	0.124355	0	0.785398	0.124355
1	1	0.124355	0	0.463648	0.124355
2	1	0.124355	0	0.244979	0.124355
3	0	0.124355	-1	0.124355	0.000000

### 3 ternary angle tree (cordic) (N=10 R=3 theta=0.124355)



$i$	$br$	$theta$	$-u(i)$	$a(i)$	$theta'$
0	1	0.124355	0	0.785398	0.124355
1	1	0.124355	0	0.463648	0.124355
2	0	0.124355	-1	0.244979	-0.120624
3	2	-0.120624	1	0.124355	0.003731
4	1	0.003731	0	0.062419	0.003731
5	1	0.003731	0	0.031240	0.003731
6	1	0.003731	0	0.015624	0.003731
7	1	0.003731	0	0.007812	0.003731
8	0	0.003731	-1	0.003906	-0.000175

ternary angle tree search (N=10)
theta= atan(pow(2,-3) = 0.124355

\* the optimal path to a leaf

level min node : depth= 9 theta= 0.000000 minval= 0.000000 id=19439

path type : leafmin

dp= 0 th= 0.124355 +1.2435499455e-01 br= 1 : -0.785398 +0.0 +0.785398
dp= 1 th= 0.124355 +1.2435499455e-01 br= 1 : -0.463648 +0.0 +0.463648
dp= 2 th= 0.124355 +1.2435499455e-01 br= 1 : -0.244979 +0.0 +0.244979
dp= 3 th= 0.124355 +1.2435499455e-01 br= 0 : -0.124355 +0.0 +0.124355
dp= 4 th= 0.000000 +0.0000000000e+00 br= 1 : -0.062419 +0.0 +0.062419
dp= 5 th= 0.000000 +0.0000000000e+00 br= 1 : -0.031240 +0.0 +0.031240
dp= 6 th= 0.000000 +0.0000000000e+00 br= 1 : -0.015624 +0.0 +0.015624
dp= 7 th= 0.000000 +0.0000000000e+00 br= 1 : -0.007812 +0.0 +0.007812
dp= 8 th= 0.000000 +0.0000000000e+00 br= 1 : -0.003906 +0.0 +0.003906
dp= 9 th= 0.000000 +0.0000000000e+00

leafmin path=1 1 1 0 1 1 1 1 1

tree=[.0 x [.1 x [.2 x [.3 [.4 x [.5 x [.6 x [.7 x [.8 x 9 x ] x ] x ] x ] x x ]
x ] x ] x ]

latex ternary\_tree\_1\_leafmin.tex > /dev/null
dvi2pdf ternary\_tree\_1\_leafmin.dvi > /dev/null
xreader -w ternary\_tree\_1\_leafmin.pdf > /dev/null

\* the global optimal path to a node

level min node : depth= 0 theta= 0.124355 minval= 0.124355 id=0
level min node : depth= 1 theta= 0.124355 minval= 0.124355 id=2
level min node : depth= 2 theta= 0.124355 minval= 0.124355 id=8
level min node : depth= 3 theta= 0.047583 minval= 0.047583 id=21
level min node : depth= 4 theta= 0.000000 minval= 0.000000 id=79
level min node : depth= 5 theta= 0.000000 minval= 0.000000 id=239
level min node : depth= 6 theta= 0.000000 minval= 0.000000 id=719
level min node : depth= 7 theta= 0.000000 minval= 0.000000 id=2159
level min node : depth= 8 theta= 0.000000 minval= 0.000000 id=6479
level min node : depth= 9 theta= 0.000000 minval= 0.000000 id=19439

global min node : depth= 4 theta= 0.000000 minval= 0.000000 id=79

path type : globalmin

dp= 0 th= 0.124355 +1.2435499455e-01 br= 1 : -0.785398 +0.0 +0.785398
dp= 1 th= 0.124355 +1.2435499455e-01 br= 1 : -0.463648 +0.0 +0.463648
dp= 2 th= 0.124355 +1.2435499455e-01 br= 1 : -0.244979 +0.0 +0.244979
dp= 3 th= 0.124355 +1.2435499455e-01 br= 0 : -0.124355 +0.0 +0.124355
dp= 4 th= 0.000000 +0.0000000000e+00

globalmin path=1 1 1 0

tree=[.0 x [.1 x [.2 x [.3 4 x x ] x ] x ] x ]
latex ternary\_tree\_2\_globalmin.tex > /dev/null
dvi2pdf ternary\_tree\_2\_globalmin.dvi > /dev/null
xreader -w ternary\_tree\_2\_globalmin.pdf > /dev/null

\* the cordic path

cordic min node : depth= 9 theta= 0.124355 minval= 0.000175 id=0

path type : cordic

dp= 0 th= 0.124355 +1.2435499455e-01 br= 1 : -0.785398 +0.0 +0.785398
dp= 1 th= 0.124355 +1.2435499455e-01 br= 1 : -0.463648 +0.0 +0.463648
dp= 2 th= 0.124355 +1.2435499455e-01 br= 0 : -0.244979 +0.0 +0.244979
dp= 3 th= -0.120624 -1.2062366858e-01 br= 2 : -0.124355 +0.0 +0.124355
dp= 4 th= 0.003731 +3.7313259667e-03 br= 1 : -0.062419 +0.0 +0.062419
dp= 5 th= 0.003731 +3.7313259667e-03 br= 1 : -0.031240 +0.0 +0.031240

```
dp= 6 th= 0.003731 +3.7313259667e-03 br= 1 : -0.015624 +0.0 +0.015624
dp= 7 th= 0.003731 +3.7313259667e-03 br= 1 : -0.007812 +0.0 +0.007812
dp= 8 th= 0.003731 +3.7313259667e-03 br= 0 : -0.003906 +0.0 +0.003906
dp= 9 th= -0.000175 -1.7490416531e-04
```

```
cordic path=1 1 0 2 1 1 1 1 0
```

```
tree=[.0 x [.1 x [.2 [.3 x x [.4 x [.5 x [.6 x [.7 x [.8 9 x x ] x ] x ] x ] ] x
x ] x ] x ]
```

```
latex ternary_tree_3_cordic.tex > /dev/null
```

```
dvipdf ternary_tree_3_cordic.dvi > /dev/null
```

```
xreader -w ternary_tree_3_cordic.pdf > /dev/null
```