

```
Last login: Tue Aug 13 15:08:57 on ttys000
anne:~ Anne$ cd codeklavier
anne:codeklavier Anne$ python3 codeklavier.py -p ccalculator
#####
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#####
```

Welcome to the Codeklavier v0.4!

```
Using Midi device: Clavinova
#####
Prototype loaded: Ccalculator AR extension 0.1
CodeKlavier is ready and LISTENING.
#####
```

Press Control-C to exit.

```
## Using the AR mapping ##
server: local
{'host': '192.168.1.14', 'port': '8081'}
web socket connected!
{'type': 'serverState', 'numTrees': 1, 'numShapes': 6}
trees and shapes: {'1': {'shape': 1}}
(
temp dynamics: [53]
successor
identity
Error in data transfer
Traceback (most recent call last):
  File "/Library/Frameworks/Python.framework/Versions/3.7/lib/python3.7/site-packages/websockets/protocol.py", line 796, in transfer_data
    message = await self.read_message()
  File "/Library/Frameworks/Python.framework/Versions/3.7/lib/python3.7/site-packages/websockets/protocol.py", line 864, in read_message
    frame = await self.read_data_frame(max_size=self.max_size)
  File "/Library/Frameworks/Python.framework/Versions/3.7/lib/python3.7/site-packages/websockets/protocol.py", line 963, in read_data_frame
    await self.pong(frame.data)
  File "/Library/Frameworks/Python.framework/Versions/3.7/lib/python3.7/site-packages/websockets/protocol.py", line 739, in pong
    await self.write_frame(True, OP_PONG, data)
  File "/Library/Frameworks/Python.framework/Versions/3.7/lib/python3.7/site-packages/websockets/protocol.py", line 1049, in write_frame
    await self.ensure_open()
  File "/Library/Frameworks/Python.framework/Versions/3.7/lib/python3.7/site-packages/websockets/protocol.py", line 772, in
```

```
ensure_open
  raise self.connection_closed_exc()
websockets.exceptions.ConnectionClosedError: code = 1006 (connection
closed abnormally [internal]), no reason
connection closed, trying to reconnect...
error sending
succ head: 1
connection closed, trying to reconnect...
error sending
[1]
connection closed, trying to reconnect...
error sending
connection closed, trying to reconnect...
web socket connected!
error sending
['.']
temp dynamics: [53, 50]
successor
web socket connected!
temp dynamics: [53, 50, 54]
successor
web socket connected!
temp dynamics: [53, 50, 54, 52]
successor
web socket connected!
identity
succ head: 3
)
rule till now: ['.', 3]
vel till now: [52]
evaluate!
['.', 3]
parsed rule: .3
parsed dynamics: 52
ckar rule : *.1,.3
current tree: 1
dynamics: [67]
successor
identity
succ head: 1
rules now osc: [1]
dynamics now: []
[1, '.']
dynamics: [46]
successor
dynamics: [46, 59]
successor
dynamics: [46, 59, 69]
successor
identity
succ head: 3
rules now osc: [1, '.', 3]
dynamics now: [58]
dynamics: [64]
```

```
successor
dynamics: [64, 65]
successor
identity
succ head: 2
rules now osc: [1, '.', 3, 2]
dynamics now: [58, 64]
dynamics: [59]
successor
dynamics: [59, 70]
successor
dynamics: [59, 70, 77]
successor
identity
succ head: 3
rules now osc: [1, '.', 3, 2, 3]
dynamics now: [58, 64, 69]
evaluate!
[1, '.', 3, 2, 3]
parsed rule: 1.323
parsed dynamics: 58|64|69
ckar rule : 1.323
current tree: 1
dynamics: [56]
successor
dynamics: [56, 65]
successor
dynamics: [56, 65, 51]
successor
identity
succ head: 3
rules now osc: [3]
dynamics now: []
[3, '.']
dynamics: [56]
successor
identity
succ head: 1
rules now osc: [3, '.', 1]
dynamics now: [56]
identity
[3, '.', 1, 0]
dynamics: [62]
successor
dynamics: [62, 54]
successor
identity
succ head: 2
rules now osc: [3, '.', 1, 0, 2]
dynamics now: [56, 0, 58]
dynamics: [74]
successor
identity
succ head: 1
```

rules now osc: [3, '.', 1, 0, 2, 1]  
dynamics now: [56, 0, 58, 74]  
dynamics: [69]  
successor  
dynamics: [69, 69]  
successor  
dynamics: [69, 69, 65]  
successor  
identity  
succ head: 3  
rules now osc: [3, '.', 1, 0, 2, 1, 3]  
dynamics now: [56, 0, 58, 74, 68]  
dynamics: [63]  
successor  
identity  
succ head: 1  
rules now osc: [3, '.', 1, 0, 2, 1, 3, 1]  
dynamics now: [56, 0, 58, 74, 68, 63]  
evaluate!  
[3, '.', 1, 0, 2, 1, 3, 1]  
parsed rule: 3.102131  
parsed dynamics: 56|0|58|74|68|63  
ckar rule : 3.102131  
current tree: 1  
dynamics: [68]  
successor  
dynamics: [68, 71]  
successor  
dynamics: [68, 71, 60]  
successor  
identity  
succ head: 3  
rules now osc: [3]  
dynamics now: []  
dynamics: [70]  
successor  
dynamics: [70, 72]  
successor  
identity  
succ head: 2  
rules now osc: [3, 2]  
dynamics now: []  
[3, 2, '.']  
identity  
[3, 2, '.', 0]  
evaluate!  
[3, 2, '.', 0]  
parsed rule: 32.0  
parsed dynamics: 0  
ckar rule : 32.0  
current tree: 1  
dynamics: [65]  
successor  
dynamics: [65, 69]

```
successor
identity
succ head: 2
rules now osc: [2]
dynamics now: []
[2, '.']
dynamics: [71]
successor
identity
succ head: 1
rules now osc: [2, '.', 1]
dynamics now: [71]
dynamics: [60]
successor
dynamics: [60, 60]
successor
dynamics: [60, 60, 54]
successor
dynamics: [60, 60, 54, 65]
successor
dynamics: [60, 60, 54, 65, 60]
successor
identity
succ head: 5
rules now osc: [2, '.', 1, 5]
dynamics now: [71, 60]
evaluate!
[2, '.', 1, 5]
parsed rule: 2.15
parsed dynamics: 71|60
ckar rule : 2.15
current tree: 1
dynamics: [68]
successor
identity
succ head: 1
rules now osc: [1]
dynamics now: []
dynamics: [69]
successor
identity
succ head: 1
rules now osc: [1, 1]
dynamics now: []
[1, 1, '.']
dynamics: [69]
successor
dynamics: [69, 70]
successor
dynamics: [69, 70, 67]
successor
dynamics: [69, 70, 67, 70]
successor
dynamics: [69, 70, 67, 70, 64]
```

```
successor
dynamics: [69, 70, 67, 70, 64, 67]
successor
dynamics: [69, 70, 67, 70, 64, 67, 69]
successor
dynamics: [69, 70, 67, 70, 64, 67, 69, 69]
successor
dynamics: [69, 70, 67, 70, 64, 67, 69, 69, 56]
successor
identity
succ head: 9
rules now osc: [1, 1, '.', 9]
dynamics now: [67]
evaluate!
[1, 1, '.', 9]
parsed rule: 11.9
parsed dynamics: 67
ckar rule : 11.9
current tree: 1
(
temp dynamics: [60]
successor
temp dynamics: [60, 65]
successor
temp dynamics: [60, 65, 70]
successor
identity
succ head: 3
[3]
)
rule till now: []
vel till now: [65]
evaluate!
[]
parsed rule:
ckar rule : *.3
current tree: 1
(
temp dynamics: [59]
successor
temp dynamics: [59, 70]
successor
Error in data transfer
Traceback (most recent call last):
  File "/Library/Frameworks/Python.framework/Versions/3.7/lib/python3.7/site-packages/websockets/protocol.py", line 796, in transfer_data
    message = await self.read_message()
  File "/Library/Frameworks/Python.framework/Versions/3.7/lib/python3.7/site-packages/websockets/protocol.py", line 864, in read_message
    frame = await self.read_data_frame(max_size=self.max_size)
  File "/Library/Frameworks/Python.framework/Versions/3.7/lib/python3.7/site-packages/websockets/protocol.py", line 963, in
```

```
read_data_frame
  await self.pong(frame.data)
  File "/Library/Frameworks/Python.framework/Versions/3.7/lib/
python3.7/site-packages/websockets/protocol.py", line 739, in pong
    await self.write_frame(True, OP_PONG, data)
  File "/Library/Frameworks/Python.framework/Versions/3.7/lib/
python3.7/site-packages/websockets/protocol.py", line 1049, in
write_frame
    await self.ensure_open()
  File "/Library/Frameworks/Python.framework/Versions/3.7/lib/
python3.7/site-packages/websockets/protocol.py", line 772, in
ensure_open
    raise self.connection_closed_exc()
websockets.exceptions.ConnectionClosedError: code = 1006 (connection
closed abnormally [internal]), no reason
connection closed, trying to reconnect...
error sending
temp dynamics: [59, 70, 71]
successor
connection closed, trying to reconnect...
error sending
identity
connection closed, trying to reconnect...
error sending
succ head: 3
connection closed, trying to reconnect...
web socket connected!
error sending
[3]
web socket connected!
temp dynamics: [59, 70, 71, 69]
successor
web socket connected!
temp dynamics: [59, 70, 71, 69, 71]
successor
web socket connected!
identity
succ head: 2
[3, 2]
temp dynamics: [59, 70, 71, 69, 71, 68]
successor
temp dynamics: [59, 70, 71, 69, 71, 68, 64]
successor
temp dynamics: [59, 70, 71, 69, 71, 68, 64, 68]
successor
identity
succ head: 3
[3, 2, 3]
)
rule till now: []
vel till now: [68]
evaluate!
[]
parsed rule:
```

```
ckar rule : *.323
current tree: 1
dynamics: [60]
successor
identity
succ head: 1
rules now osc: [1]
dynamics now: []
dynamics: [67]
successor
identity
succ head: 1
rules now osc: [1, 1]
dynamics now: []
[1, 1, '.']
identity
[1, 1, '.', 0]
evaluate!
[1, 1, '.', 0]
parsed rule: 11.0
parsed dynamics: 0
ckar rule : 11.0
current tree: 1
dynamics: [49]
successor
dynamics: [49, 68]
successor
dynamics: [49, 68, 56]
successor
identity
succ head: 3
rules now osc: [3]
dynamics now: []
[3, '.']
identity
[3, '.', 0]
evaluate!
[3, '.', 0]
parsed rule: 3.0
parsed dynamics: 0
ckar rule : 3.0
current tree: 1
go to next tree 1
identity
[0]
identity
[0, 0]
[0, 0, 0]
[0, 0, 0, 0]
[0, 0, 0, 0, '.']
identity
[0, 0, 0, 0, '.', 0]
evaluate!
[0, 0, 0, 0, '.', 0]
```



```
parsed rule: 0000.0
parsed dynamics: 0
ckar rule : 0000.0
current tree: 1
create new tree total trees: 2
curent trees: {'1': {'shape': 1}, '2': {'shape': 1}}
(
temp dynamics: [54]
successor
temp dynamics: [54, 56]
successor
temp dynamics: [54, 56, 61]
successor
temp dynamics: [54, 56, 61, 54]
successor
identity
succ head: 4
[4]
temp dynamics: [54, 56, 61, 54, 48]
successor
temp dynamics: [54, 56, 61, 54, 48, 74]
successor
temp dynamics: [54, 56, 61, 54, 48, 74, 86]
successor
temp dynamics: [54, 56, 61, 54, 48, 74, 86, 89]
successor
temp dynamics: [54, 56, 61, 54, 48, 74, 86, 89, 67]
predecessor
2
identity
[4, 0]
)
rule till now: []
vel till now: [65]
evaluate!
[]
parsed rule:
ckar rule : *.40
current tree: 2
identity
[0]
[0, '.']
dynamics: [50]
successor
dynamics: [50, 59]
successor
dynamics: [50, 59, 61]
successor
identity
succ head: 3
rules now osc: [0, '.', 3]
dynamics now: [57]
dynamics: [53]
successor
```

dynamics: [53, 58]  
successor  
dynamics: [53, 58, 62]  
successor  
identity  
succ head: 3  
rules now osc: [0, '.', 3, 3]  
dynamics now: [57, 58]  
dynamics: [38]  
successor  
dynamics: [38, 59]  
successor  
dynamics: [38, 59, 71]  
successor  
identity  
succ head: 3  
rules now osc: [0, '.', 3, 3, 3]  
dynamics now: [57, 58, 56]  
evaluate!  
[0, '.', 3, 3, 3]  
parsed rule: 0.333  
parsed dynamics: 57|58|56  
ckar rule : 0.333  
current tree: 2  
dynamics: [44]  
successor  
dynamics: [44, 67]  
successor  
dynamics: [44, 67, 71]  
successor  
identity  
succ head: 3  
rules now osc: [3]  
dynamics now: []  
[3, '.']  
dynamics: [62]  
successor  
dynamics: [62, 61]  
successor  
dynamics: [62, 61, 62]  
successor  
dynamics: [62, 61, 62, 62]  
successor  
dynamics: [62, 61, 62, 62, 57]  
successor  
dynamics: [62, 61, 62, 62, 57, 56]  
successor  
identity  
succ head: 6  
rules now osc: [3, '.', 6]  
dynamics now: [60]  
evaluate!  
[3, '.', 6]  
parsed rule: 3.6

```
parsed dynamics: 60
ckar rule : 3.6
current tree: 2
dynamics: [61]
successor
dynamics: [61, 52]
successor
dynamics: [61, 52, 56]
successor
dynamics: [61, 52, 56, 60]
successor
dynamics: [61, 52, 56, 60, 67]
successor
dynamics: [61, 52, 56, 60, 67, 59]
successor
identity
succ head: 6
rules now osc: [6]
dynamics now: []
dynamics: [67]
successor
dynamics: [67, 76]
successor
dynamics: [67, 76, 77]
successor
dynamics: [67, 76, 77, 80]
successor
dynamics: [67, 76, 77, 80, 83]
successor
dynamics: [67, 76, 77, 80, 83, 72]
successor
identity
succ head: 6
rules now osc: [6, 6]
dynamics now: []
[6, 6, '.']
dynamics: [43]
successor
dynamics: [43, 38]
successor
dynamics: [43, 38, 49]
successor
identity
succ head: 3
rules now osc: [6, 6, '.', 3]
dynamics now: [43]
identity
[6, 6, '.', 3, 0]
dynamics: [51]
successor
dynamics: [51, 53]
successor
dynamics: [51, 53, 59]
successor
```

```

identity
succ head: 3
rules now osc: [6, 6, '.', 3, 0, 3]
dynamics now: [43, 0, 54]
evaluate!
[6, 6, '.', 3, 0, 3]
parsed rule: 66.303
parsed dynamics: 43|0|54
ckar rule : 66.303
current tree: 2
dynamics: [59]
successor
dynamics: [59, 46]
successor
dynamics: [59, 46, 56]
successor
create new tree total trees: 3
curent trees: {'1': {'shape': 1}, '2': {'shape': 2}, '3': {'shape': 1}}
addition
addition
dynamics: [59, 46, 56, 54]
successor
greater than
addition
dynamics: [59, 46, 56, 54, 50]
successor
dynamics: [59, 46, 56, 54, 50, 40]
successor
dynamics: [59, 46, 56, 54, 50, 40, 31]
successor
dynamics: [59, 46, 56, 54, 50, 40, 31, 38]
successor
dynamics: [59, 46, 56, 54, 50, 40, 31, 38, 46]
successor
(
identity
succ head: 9
[9]
)
rule till now: []
vel till now: []
evaluate!
[]
parsed rule:
ckar rule : *.9
current tree: 3
3
evaluate!
[]
dynamics: [59]
successor
(
)

```

```
(
temp dynamics: [52]
successor
temp dynamics: [52, 56]
successor
temp dynamics: [52, 56, 64]
successor
temp dynamics: [52, 56, 64, 73]
successor
temp dynamics: [52, 56, 64, 73, 69]
successor
identity
succ head: 6
[6]
)
rule till now: []
vel till now: [63]
evaluate!
[]
parsed rule:
ckar rule : *.6
current tree: 3
transform tree 3
transform tree 3
transform tree 3
transform tree 3
transform tree 3
transform tree 3
transform tree 3
transform tree 3
transform tree 3
transform tree 3
transform tree 3
transform tree 3
transform tree 3
transform tree 3
transform tree 3
dynamics: [55]
successor
dynamics: [55, 71]
successor
dynamics: [55, 71, 67]
successor
dynamics: [55, 71, 67, 76]
successor
dynamics: [55, 71, 67, 76, 79]
successor
dynamics: [55, 71, 67, 76, 79, 70]
successor
identity
succ head: 6
rules now osc: [6]
dynamics now: []
[6, '.']
dynamics: [78]
successor
identity
succ head: 1
rules now osc: [6, '.', 1]
```

```
dynamics now: [78]
identity
[6, '.', 1, 0]
dynamics: [78]
successor
identity
succ head: 1
rules now osc: [6, '.', 1, 0, 1]
dynamics now: [78, 0, 78]
evaluate!
[6, '.', 1, 0, 1]
parsed rule: 6.101
parsed dynamics: 78|0|78
ckar rule : 6.101
current tree: 3
dynamics: [90]
successor
identity
succ head: 1
rules now osc: [1]
dynamics now: []
identity
[1, 0]
[1, 0, '.']
dynamics: [68]
successor
dynamics: [68, 79]
successor
dynamics: [68, 79, 69]
successor
identity
succ head: 3
rules now osc: [1, 0, '.', 3]
dynamics now: [72]
dynamics: [71]
successor
dynamics: [71, 87]
successor
dynamics: [71, 87, 77]
successor
dynamics: [71, 87, 77, 89]
successor
dynamics: [71, 87, 77, 89, 79]
successor
dynamics: [71, 87, 77, 89, 79, 87]
successor
dynamics: [71, 87, 77, 89, 79, 87, 79]
successor
identity
succ head: 7
rules now osc: [1, 0, '.', 3, 7]
dynamics now: [72, 81]
dynamics: [68]
successor
```

```
dynamics: [68, 77]
successor
dynamics: [68, 77, 69]
successor
dynamics: [68, 77, 69, 83]
successor
dynamics: [68, 77, 69, 83, 78]
successor
identity
succ head: 5
rules now osc: [1, 0, '.', 3, 7, 5]
dynamics now: [72, 81, 75]
dynamics: [80]
successor
dynamics: [80, 67]
successor
dynamics: [80, 67, 69]
successor
identity
succ head: 3
rules now osc: [1, 0, '.', 3, 7, 5, 3]
dynamics now: [72, 81, 75, 72]
evaluate!
[1, 0, '.', 3, 7, 5, 3]
parsed rule: 10.3753
parsed dynamics: 72|81|75|72
ckar rule : 10.3753
current tree: 3
dynamics: [79]
successor
dynamics: [79, 79]
successor
dynamics: [79, 79, 78]
successor
identity
succ head: 3
rules now osc: [3]
dynamics now: []
[3, '.']
dynamics: [59]
successor
dynamics: [59, 66]
successor
dynamics: [59, 66, 50]
successor
dynamics: [59, 66, 50, 69]
successor
dynamics: [59, 66, 50, 69, 69]
successor
dynamics: [59, 66, 50, 69, 69, 78]
successor
dynamics: [59, 66, 50, 69, 69, 78, 73]
successor
dynamics: [59, 66, 50, 69, 69, 78, 73, 78]
```

```
successor
dynamics: [59, 66, 50, 69, 69, 78, 73, 78, 78]
successor
identity
succ head: 9
rules now osc: [3, '.', 9]
dynamics now: [69]
evaluate!
[3, '.', 9]
parsed rule: 3.9
parsed dynamics: 69
ckar rule : 3.9
current tree: 3
dynamics: [50]
successor
identity
succ head: 1
rules now osc: [1]
dynamics now: []
create new tree total trees: 4
curent trees: {'1': {'shape': 1}, '2': {'shape': 2}, '3': {'shape':
4}, '4': {'shape': 1}}
(
temp dynamics: [72]
successor
temp dynamics: [72, 83]
successor
temp dynamics: [72, 83, 99]
successor
temp dynamics: [72, 83, 99, 98]
successor
temp dynamics: [72, 83, 99, 98, 110]
successor
temp dynamics: [72, 83, 99, 98, 110, 114]
successor
identity
succ head: 6
[6]
)
rule till now: [1]
vel till now: [96]
dynamics: [53]
successor
dynamics: [53, 43]
successor
dynamics: [53, 43, 46]
successor
dynamics: [53, 43, 46, 39]
successor
dynamics: [53, 43, 46, 39, 48]
successor
identity
succ head: 5
rules now osc: [1, 5]
```



```
dynamics now: [96]
dynamics: [47]
successor
dynamics: [47, 62]
successor
dynamics: [47, 62, 82]
successor
dynamics: [47, 62, 82, 92]
successor
identity
succ head: 4
rules now osc: [1, 5, 4]
dynamics now: [96]
evaluate!
[1, 5, 4]
parsed rule: 154
parsed dynamics: 96
ckar rule : *.6,154
current tree: 4
dynamics: [52]
successor
dynamics: [52, 56]
successor
identity
succ head: 2
rules now osc: [2]
dynamics now: []
evaluate!
[2]
dynamics: [60]
successor
dynamics: [60, 58]
successor
dynamics: [60, 58, 69]
successor
dynamics: [60, 58, 69, 82]
successor
dynamics: [60, 58, 69, 82, 85]
successor
dynamics: [60, 58, 69, 82, 85, 92]
successor
identity
succ head: 6
rules now osc: [2, 6]
dynamics now: []
[2, 6, '.']
identity
[2, 6, '.', 0]
evaluate!
[2, 6, '.', 0]
parsed rule: 26.0
parsed dynamics: 0
ckar rule : 26.0
current tree: 4
```

```
dynamics: [67]
successor
dynamics: [67, 69]
successor
dynamics: [67, 69, 87]
successor
dynamics: [67, 69, 87, 93]
successor
dynamics: [67, 69, 87, 93, 100]
successor
dynamics: [67, 69, 87, 93, 100, 107]
successor
identity
succ head: 6
rules now osc: [6]
dynamics now: []
[6, '.']
dynamics: [80]
successor
identity
succ head: 1
rules now osc: [6, '.', 1]
dynamics now: [80]
identity
[6, '.', 1, 0]
dynamics: [79]
successor
dynamics: [79, 76]
successor
dynamics: [79, 76, 86]
successor
dynamics: [79, 76, 86, 80]
successor
identity
succ head: 4
rules now osc: [6, '.', 1, 0, 4]
dynamics now: [80, 0, 80]
dynamics: [75]
successor
identity
succ head: 1
rules now osc: [6, '.', 1, 0, 4, 1]
dynamics now: [80, 0, 80, 75]
dynamics: [79]
successor
dynamics: [79, 78]
successor
dynamics: [79, 78, 79]
successor
identity
succ head: 3
rules now osc: [6, '.', 1, 0, 4, 1, 3]
dynamics now: [80, 0, 80, 75, 79]
evaluate!
```

```
[6, '.', 1, 0, 4, 1, 3]
parsed rule: 6.10413
parsed dynamics: 80|0|80|75|79
ckar rule : 6.10413
current tree: 4
evaluate!
[]
evaluate!
[]
go to next tree 1
identity
[0]
identity
[0, 0]
identity
[0, 0, 0]
identity
[0, 0, 0, 0]
identity
[0, 0, 0, 0, 0]
identity
[0, 0, 0, 0, 0, 0]
identity
[0, 0, 0, 0, 0, 0, 0]
identity
[0, 0, 0, 0, 0, 0, 0, 0]
found ostinato! ['C#5', 'D#5', 'G#5', 'A#5']
identity
[0, 0, 0, 0, 0, 0, 0, 0, 0]
identity
[0, 0, 0, 0, 0, 0, 0, 0, 0, 0]
identity
[0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0]
identity
[0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0]
greater than
identity
[0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0]
identity
[0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0]
compare: ['C#5', 'D#5', 'G#5', 'A#5']
ostinato did not change
first: ['C#5', 'D#5', 'G#5', 'A#5'] compare: ['C#5', 'D#5', 'G#5',
'A#5']
identity
[0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0]
identity
[0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0]
identity
[0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0]
identity
[0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0]
identity
[0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0]
identity
[0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0]
```





0, 0]

identity

[0,  
0,  
0]

identity

[0,  
0,  
0, 0]

identity

[0,  
0,  
0, 0, 0]

identity

[0,  
0,  
0, 0, 0, 0]

identity

[0,  
0,  
0, 0, 0, 0, 0]

found ostinato! ['B4', 'D#5', 'G#5', 'A#5']

identity

[0,  
0,  
0, 0, 0, 0, 0, 0]

identity

[0,  
0,  
0, 0, 0, 0, 0, 0, 0]

identity

[0,  
0,  
0, 0, 0, 0, 0, 0, 0]

identity

[0,  
0,  
0, 0, 0, 0, 0, 0, 0]

b chordmem: [71, 75] b deltamem [111.01104889200016,  
111.01714587500017]

average: 0.006096983000006162

chordmem: [71, 75] deltamem [111.01104889200016,  
111.01714587500017]

b chordmem: [71, 75, 82] b deltamem [111.01104889200016,  
111.01714587500017, 111.01404094200016]

average: 0.0014960250000015662

chordmem: [71, 75, 82] deltamem [111.01104889200016,  
111.01714587500017, 111.01404094200016]

identity

[0,  
0,  
0, 0, 0, 0, 0, 0, 0, 0]

b chordmem: [71, 75, 82, 80] b deltamem [111.01104889200016,  
111.01714587500017, 111.01404094200016, 111.02102949500016]

average: 0.0033268676666674915  
b chordmem: [71, 75] b deltamem [112.51606126000019, 112.52306276000019]  
average: 0.007001500000001215  
chordmem: [71, 75] deltamem [112.51606126000019, 112.52306276000019]  
b chordmem: [71, 75, 80] b deltamem [112.51606126000019, 112.52306276000019, 112.51937587000019]  
average: 0.0016573050000019407  
chordmem: [71, 75, 80] deltamem [112.51606126000019, 112.52306276000019, 112.51937587000019]  
b chordmem: [71, 75, 80, 82] b deltamem [112.51606126000019, 112.52306276000019, 112.51937587000019, 112.51209570200018]  
average: -0.0013218526666681403  
identity  
[0]  
b chordmem: [71, 75] b deltamem [114.4660310470002, 114.4690950770002]  
average: 0.0030640300000044363  
chordmem: [71, 75] deltamem [114.4660310470002, 114.4690950770002]  
b chordmem: [71, 75, 82] b deltamem [114.4660310470002, 114.4690950770002, 114.4730183120002]  
average: 0.0034936325000032298  
chordmem: [71, 75, 82] deltamem [114.4660310470002, 114.4690950770002, 114.4730183120002]  
identity  
[0, 0]  
b chordmem: [71, 75, 82, 80] b deltamem [114.4660310470002, 114.4690950770002, 114.4730183120002, 114.4760106260002]  
average: 0.003326526333334338  
b chordmem: [71, 75] b deltamem [119.04608601000024, 119.04799974500024]  
average: 0.001913735000002248  
chordmem: [71, 75] deltamem [119.04608601000024, 119.04799974500024]  
b chordmem: [71, 75, 82] b deltamem [119.04608601000024, 119.04799974500024, 119.04295801500024]  
average: -0.001563997499999914  
chordmem: [71, 75, 82] deltamem [119.04608601000024, 119.04799974500024, 119.04295801500024]  
identity  
[0]  
b chordmem: [71, 75, 82, 80] b deltamem [119.04608601000024, 119.04799974500024, 119.04295801500024, 119.05211466000024]  
average: 0.002009550000001544  
b chordmem: [71, 75] b deltamem [120.50104929200025, 120.50715908700025]  
average: 0.0061097950000004175  
chordmem: [71, 75] deltamem [120.50104929200025, 120.50715908700025]  
b chordmem: [71, 75, 82] b deltamem [120.50104929200025, 120.50715908700025, 120.50392730500025]  
average: 0.0014390065000000618  
chordmem: [71, 75, 82] deltamem [120.50104929200025,

120.50715908700025, 120.50392730500025]  
identity  
[0]  
b chordmem: [71, 75, 82, 80] b deltamem [120.50104929200025,  
120.50715908700025, 120.50392730500025, 120.51053189700025]  
average: 0.0031608683333341028  
identity  
[0]  
identity  
[0, 0]  
evaluate!  
[0, 0]  
parsed rule: 00  
parsed dynamics:  
ckar rule : 00  
current tree: 1  
identity  
[0]  
evaluate!  
[0]  
evaluate!  
[0]  
evaluate!  
[0]  
b chordmem: [71, 75] b deltamem [128.5180880950002,  
128.52508604000022]  
average: 0.006997945000023265  
chordmem: [71, 75] deltamem [128.5180880950002, 128.52508604000022]  
b chordmem: [71, 75, 82] b deltamem [128.5180880950002,  
128.52508604000022, 128.5210799950002]  
average: 0.0014959500000060189  
chordmem: [71, 75, 82] deltamem [128.5180880950002,  
128.52508604000022, 128.5210799950002]  
identity  
[0, 0]  
b chordmem: [71, 75, 82, 80] b deltamem [128.5180880950002,  
128.52508604000022, 128.5210799950002, 128.5278946520002]  
average: 0.0032688523333395856  
b chordmem: [73, 75] b deltamem [129.23403688000025,  
129.23800479200025]  
average: 0.003967912000007345  
chordmem: [73, 75] deltamem [129.23403688000025,  
129.23800479200025]  
b chordmem: [73, 75, 80] b deltamem [129.23403688000025,  
129.23800479200025, 129.24105005000024]  
average: 0.003506584999996676  
chordmem: [73, 75, 80] deltamem [129.23403688000025,  
129.23800479200025, 129.24105005000024]  
b chordmem: [73, 75, 80, 82] b deltamem [129.23403688000025,  
129.23800479200025, 129.24105005000024, 129.24406422000024]  
average: 0.0033424466666645003  
identity  
[0]  
b chordmem: [71, 82] b deltamem [130.4850070360002,



130.4900041060002]  
average: 0.004997070000001713  
chordmem: [71, 82] deltamem [130.4850070360002, 130.4900041060002]  
identity  
[0, 0]  
b chordmem: [71, 82, 75] b deltamem [130.4850070360002,  
130.4900041060002, 130.49599807200022]  
average: 0.005495518000003585  
chordmem: [71, 82, 75] deltamem [130.4850070360002,  
130.4900041060002, 130.49599807200022]  
b chordmem: [71, 82, 75, 80] b deltamem [130.4850070360002,  
130.4900041060002, 130.49599807200022, 130.4929935620002]  
average: 0.0026621753333320917  
b chordmem: [73, 80] b deltamem [131.2359777770002,  
131.2491152000002]  
average: 0.013137423000017634  
chordmem: [73, 80] deltamem [131.2359777770002, 131.2491152000002]  
b chordmem: [73, 80, 82] b deltamem [131.2359777770002,  
131.2491152000002, 131.2429558970002]  
average: 0.003489060000006816  
chordmem: [73, 80, 82] deltamem [131.2359777770002,  
131.2491152000002, 131.2429558970002]  
identity  
[0]  
b chordmem: [73, 80, 82, 75] b deltamem [131.2359777770002,  
131.2491152000002, 131.2429558970002, 131.2449451180002]  
average: 0.002989113666671983  
b chordmem: [71, 82] b deltamem [132.48496398600017,  
132.49297078300017]  
average: 0.008006797000007282  
chordmem: [71, 82] deltamem [132.48496398600017,  
132.49297078300017]  
identity  
[0]  
b chordmem: [71, 82, 75] b deltamem [132.48496398600017,  
132.49297078300017, 132.48874479200018]  
average: 0.0018904030000044258  
chordmem: [71, 82, 75] deltamem [132.48496398600017,  
132.49297078300017, 132.48874479200018]  
b chordmem: [71, 82, 75, 80] b deltamem [132.48496398600017,  
132.49297078300017, 132.48874479200018, 132.49587738000017]  
average: 0.003637797999999748  
b chordmem: [73, 75] b deltamem [133.04492487200017,  
133.05453142000016]  
average: 0.009606547999993609  
chordmem: [73, 75] deltamem [133.04492487200017,  
133.05453142000016]  
b chordmem: [73, 75, 82] b deltamem [133.04492487200017,  
133.05453142000016, 133.04889968600017]  
average: 0.00198740700000144  
chordmem: [73, 75, 82] deltamem [133.04492487200017,  
133.05453142000016, 133.04889968600017]  
identity  
[0]

b chordmem: [73, 75, 82, 80] b deltamem [133.04492487200017,  
133.05453142000016, 133.04889968600017, 133.05891625700016]  
average: 0.004663794999999027  
b chordmem: [73, 75] b deltamem [133.52905329200013,  
133.54193083200013]  
average: 0.012877540000005183  
chordmem: [73, 75] deltamem [133.52905329200013,  
133.54193083200013]  
b chordmem: [73, 75, 82] b deltamem [133.52905329200013,  
133.54193083200013, 133.53305766700012]  
average: 0.00200218749999969214  
chordmem: [73, 75, 82] deltamem [133.52905329200013,  
133.54193083200013, 133.53305766700012]  
identity  
[0]  
b chordmem: [73, 75, 82, 80] b deltamem [133.52905329200013,  
133.54193083200013, 133.53305766700012, 133.53903653500012]  
average: 0.003327747666664512  
b chordmem: [73, 75] b deltamem [134.01191097700013,  
134.02623161500014]  
average: 0.014320638000015151  
chordmem: [73, 75] deltamem [134.01191097700013,  
134.02623161500014]  
b chordmem: [73, 75, 82] b deltamem [134.01191097700013,  
134.02623161500014, 134.02302345200013]  
average: 0.005556237500002226  
chordmem: [73, 75, 82] deltamem [134.01191097700013,  
134.02623161500014, 134.02302345200013]  
identity  
[0]  
b chordmem: [73, 75, 82, 80] b deltamem [134.01191097700013,  
134.02623161500014, 134.02302345200013, 134.03809060500015]  
average: 0.0087265426666742  
b chordmem: [73, 75] b deltamem [134.24699126000013,  
134.25905568500013]  
average: 0.012064425000005485  
chordmem: [73, 75] deltamem [134.24699126000013,  
134.25905568500013]  
b chordmem: [73, 75, 80] b deltamem [134.24699126000013,  
134.25905568500013, 134.26590867700014]  
average: 0.009458708500005741  
chordmem: [73, 75, 80] deltamem [134.24699126000013,  
134.25905568500013, 134.26590867700014]  
b chordmem: [73, 75, 80, 82] b deltamem [134.24699126000013,  
134.25905568500013, 134.26590867700014, 134.25509660700013]  
average: 0.002701782333332403  
identity  
[0]  
compare: ['C#5', 'D#5', 'G#5', 'A#5']  
ostinato has 2 note difference! well done  
first: ['B4', 'D#5', 'G#5', 'A#5'] compare: ['C#5', 'D#5', 'G#5',  
'A#5']  
b chordmem: [75, 73] b deltamem [134.72891182200007,  
134.72205821700007]

```
average: -0.0068536050000034265
chordmem: [75, 73] deltamem [134.72891182200007,
134.72205821700007]
define func body...
b chordmem: [75, 73, 80] b deltamem [134.72891182200007,
134.72205821700007, 134.73187017700008]
average: 0.001479177500002038
chordmem: [75, 73, 80] deltamem [134.72891182200007,
134.72205821700007, 134.73187017700008]
define func body...
b chordmem: [75, 73, 80, 82] b deltamem [134.72891182200007,
134.72205821700007, 134.73187017700008, 134.72496132200007]
average: -0.0013168333333339888
identity
[0]
define func body...
define func body...
b chordmem: [73, 75] b deltamem [135.27698256000008,
135.28110248200008]
average: 0.004119922000000997
chordmem: [73, 75] deltamem [135.27698256000008,
135.28110248200008]
define func body...
b chordmem: [73, 75, 82] b deltamem [135.27698256000008,
135.28110248200008, 135.28491236200009]
average: 0.003964901000003351
chordmem: [73, 75, 82] deltamem [135.27698256000008,
135.28110248200008, 135.28491236200009]
identity
[0, 0]
define func body...
b chordmem: [73, 75, 82, 80] b deltamem [135.27698256000008,
135.28110248200008, 135.28491236200009, 135.2959267500001]
average: 0.00631473000000445
define func body...
define func body...
b chordmem: [73, 75] b deltamem [135.76190501600007,
135.77192795500008]
average: 0.010022939000009501
chordmem: [73, 75] deltamem [135.76190501600007,
135.77192795500008]
define func body...
b chordmem: [73, 75, 82] b deltamem [135.76190501600007,
135.77192795500008, 135.76909683500008]
average: 0.0035959095000066554
chordmem: [73, 75, 82] deltamem [135.76190501600007,
135.77192795500008, 135.76909683500008]
identity
[0]
define func body...
b chordmem: [73, 75, 82, 80] b deltamem [135.76190501600007,
135.77192795500008, 135.76909683500008, 135.7810864070001]
average: 0.006393797000005937
define func body...
```

```
define func body...
b chordmem: [75, 73] b deltamem [136.2788752550001,
136.2629227620001]
average: -0.015952492999986134
chordmem: [75, 73] deltamem [136.2788752550001, 136.2629227620001]
define func body...
b chordmem: [75, 73, 82] b deltamem [136.2788752550001,
136.2629227620001, 136.2688755830001]
average: -0.004999835999996094
chordmem: [75, 73, 82] deltamem [136.2788752550001,
136.2629227620001, 136.2688755830001]
identity
[0]
define func body...
b chordmem: [75, 73, 82, 80] b deltamem [136.2788752550001,
136.2629227620001, 136.2688755830001, 136.2758717750001]
average: -0.0010011599999965408
define func body...
define func body...
b chordmem: [73, 75] b deltamem [136.4890926150001,
136.5008690810001]
average: 0.011776466000014807
chordmem: [73, 75] deltamem [136.4890926150001, 136.5008690810001]
define func body...
b chordmem: [73, 75, 82] b deltamem [136.4890926150001,
136.5008690810001, 136.4979134870001]
average: 0.004410436000000573
chordmem: [73, 75, 82] deltamem [136.4890926150001,
136.5008690810001, 136.4979134870001]
identity
[0]
define func body...
b chordmem: [73, 75, 82, 80] b deltamem [136.4890926150001,
136.5008690810001, 136.4979134870001, 136.5161564420001]
average: 0.009021275666668771
define func body...
define func body...
b chordmem: [73, 75] b deltamem [136.7289381680001,
136.74302305000012]
average: 0.014084882000020116
chordmem: [73, 75] deltamem [136.7289381680001, 136.74302305000012]
define func body...
b chordmem: [73, 75, 80] b deltamem [136.7289381680001,
136.74302305000012, 136.7469331550001]
average: 0.008997493500004339
chordmem: [73, 75, 80] deltamem [136.7289381680001,
136.74302305000012, 136.7469331550001]
define func body...
b chordmem: [73, 75, 80, 82] b deltamem [136.7289381680001,
136.74302305000012, 136.7469331550001, 136.7391179350001]
average: 0.0033932556666703326
identity
[0]
define func body...
```

```
define func body...
function with no args complete...
[[73, 75, 80, 82], [71, 75, 80, 82]]
chord is assigned already. cannot overwrite
chord is assigned already. cannot overwrite
b chordmem: [71, 75] b deltamem [137.4779524670001,
137.4920180550001]
average: 0.0140655879999994023
chordmem: [71, 75] deltamem [137.4779524670001, 137.4920180550001]
b chordmem: [71, 75, 82] b deltamem [137.4779524670001,
137.4920180550001, 137.4810779470001]
average: 0.0015627399999971203
chordmem: [71, 75, 82] deltamem [137.4779524670001,
137.4920180550001, 137.4810779470001]
identity
[0, 0]
b chordmem: [71, 75, 82, 80] b deltamem [137.4779524670001,
137.4920180550001, 137.4810779470001, 137.4950307770001]
average: 0.005692769999996017
b chordmem: [73, 75] b deltamem [138.01595662200006,
138.02992613200007]
average: 0.013969510000009677
chordmem: [73, 75] deltamem [138.01595662200006,
138.02992613200007]
b chordmem: [73, 75, 82] b deltamem [138.01595662200006,
138.02992613200007, 138.02593502700006]
average: 0.004989202499999124
chordmem: [73, 75, 82] deltamem [138.01595662200006,
138.02992613200007, 138.02593502700006]
identity
[0]
b chordmem: [73, 75, 82, 80] b deltamem [138.01595662200006,
138.02992613200007, 138.02593502700006, 138.03390129200008]
average: 0.005981556666673289
b chordmem: [73, 75] b deltamem [138.52102876500007,
138.53298699200008]
average: 0.011958227000008037
chordmem: [73, 75] deltamem [138.52102876500007,
138.53298699200008]
b chordmem: [73, 75, 82] b deltamem [138.52102876500007,
138.53298699200008, 138.53009087200007]
average: 0.004531053500002713
chordmem: [73, 75, 82] deltamem [138.52102876500007,
138.53298699200008, 138.53009087200007]
identity
[0]
b chordmem: [73, 75, 82, 80] b deltamem [138.52102876500007,
138.53298699200008, 138.53009087200007, 138.53688395200007]
average: 0.00528506233333322
b chordmem: [73, 75] b deltamem [139.00401340500008,
139.01697872000005]
average: 0.012965314999973998
chordmem: [73, 75] deltamem [139.00401340500008,
139.01697872000005]
```

b chordmem: [73, 75, 82] b deltamem [139.00401340500008,  
139.01697872000005, 139.01393328200007]  
average: 0.004959938499993655  
chordmem: [73, 75, 82] deltamem [139.00401340500008,  
139.01697872000005, 139.01393328200007]  
identity  
[0]  
b chordmem: [73, 75, 82, 80] b deltamem [139.00401340500008,  
139.01697872000005, 139.01393328200007, 139.02193540200005]  
average: 0.005973998999991181  
b chordmem: [73, 75] b deltamem [139.49393059200005,  
139.50738897200006]  
average: 0.01345838000000299  
chordmem: [73, 75] deltamem [139.49393059200005,  
139.50738897200006]  
b chordmem: [73, 75, 82] b deltamem [139.49393059200005,  
139.50738897200006, 139.50203601500004]  
average: 0.004052711499994643  
chordmem: [73, 75, 82] deltamem [139.49393059200005,  
139.50738897200006, 139.50203601500004]  
identity  
[0]  
b chordmem: [73, 75, 82, 80] b deltamem [139.49393059200005,  
139.50738897200006, 139.50203601500004, 139.51105412800007]  
average: 0.005707845333337976  
b chordmem: [73, 75] b deltamem [139.73407905700003,  
139.74317208700003]  
average: 0.0090930300000025  
chordmem: [73, 75] deltamem [139.73407905700003,  
139.74317208700003]  
b chordmem: [73, 75, 82] b deltamem [139.73407905700003,  
139.74317208700003, 139.74913276500004]  
average: 0.007526854000005301  
chordmem: [73, 75, 82] deltamem [139.73407905700003,  
139.74317208700003, 139.74913276500004]  
identity  
[0]  
b chordmem: [73, 75, 82, 80] b deltamem [139.73407905700003,  
139.74317208700003, 139.74913276500004, 139.75789045000005]  
average: 0.007937131000005593  
b chordmem: [73, 75] b deltamem [140.22696356700007,  
140.23097389200007]  
average: 0.0040103249999958734  
chordmem: [73, 75] deltamem [140.22696356700007,  
140.23097389200007]  
b chordmem: [73, 75, 82] b deltamem [140.22696356700007,  
140.23097389200007, 140.23695723200007]  
average: 0.00499683249999805  
chordmem: [73, 75, 82] deltamem [140.22696356700007,  
140.23097389200007, 140.23695723200007]  
identity  
[0]  
b chordmem: [73, 75, 82, 80] b deltamem [140.22696356700007,  
140.23097389200007, 140.23695723200007, 140.24608543000008]

average: 0.006373954333336466  
b chordmem: [73, 75] b deltamem [140.73093092500005,  
140.73986873800007]  
average: 0.008937813000017059  
chordmem: [73, 75] deltamem [140.73093092500005,  
140.73986873800007]  
b chordmem: [73, 75, 82] b deltamem [140.73093092500005,  
140.73986873800007, 140.73589173700006]  
average: 0.0024804060000036543  
chordmem: [73, 75, 82] deltamem [140.73093092500005,  
140.73986873800007, 140.73589173700006]  
identity  
[0]  
b chordmem: [73, 75, 82, 80] b deltamem [140.73093092500005,  
140.73986873800007, 140.73589173700006, 140.74390455700006]  
average: 0.004324544000004001  
b chordmem: [73, 75] b deltamem [141.51893481200008,  
141.52592689000008]  
average: 0.006992077999996127  
chordmem: [73, 75] deltamem [141.51893481200008,  
141.52592689000008]  
b chordmem: [73, 75, 82] b deltamem [141.51893481200008,  
141.52592689000008, 141.52885285700001]  
average: 0.00495902250000313  
chordmem: [73, 75, 82] deltamem [141.51893481200008,  
141.52592689000008, 141.52885285700001]  
identity  
[0]  
b chordmem: [73, 75, 82, 80] b deltamem [141.51893481200008,  
141.52592689000008, 141.52885285700001, 141.53286724800001]  
average: 0.004644145333334866  
b chordmem: [73, 75] b deltamem [142.49686048200001,  
142.50708230500013]  
average: 0.010221823000023278  
chordmem: [73, 75] deltamem [142.49686048200001, 142.50708230500013]  
b chordmem: [73, 75, 82] b deltamem [142.49686048200001,  
142.50708230500013, 142.50405475500001]  
average: 0.003597136500005149  
chordmem: [73, 75, 82] deltamem [142.49686048200001,  
142.50708230500013, 142.50405475500001]  
identity  
[0]  
b chordmem: [73, 75, 82, 80] b deltamem [142.49686048200001,  
142.50708230500013, 142.50405475500001, 142.51485752000013]  
average: 0.005999012666677572  
b chordmem: [73, 75] b deltamem [143.52388109600002,  
143.53299893700017]  
average: 0.009117840999977034  
chordmem: [73, 75] deltamem [143.52388109600002, 143.53299893700017]  
b chordmem: [73, 75, 82] b deltamem [143.52388109600002,  
143.53299893700017, 143.52789261500018]  
average: 0.002005759499994042  
chordmem: [73, 75, 82] deltamem [143.52388109600002,  
143.53299893700017, 143.52789261500018]

identity  
[0]  
b chordmem: [73, 75, 82, 80] b deltamem [143.5238810960002, 143.53299893700017, 143.52789261500018, 143.53693811500017]  
average: 0.004352339666657675  
found ostinato! ['C#5', 'D#5', 'G#5', 'A#5']  
b chordmem: [73, 75] b deltamem [144.52894040700022, 144.5360197450002]  
average: 0.007079337999982727  
chordmem: [73, 75] deltamem [144.52894040700022, 144.5360197450002]  
b chordmem: [73, 75, 82] b deltamem [144.52894040700022, 144.5360197450002, 144.5319027680002]  
average: 0.001481180499993684  
chordmem: [73, 75, 82] deltamem [144.52894040700022, 144.5360197450002, 144.5319027680002]  
identity  
[0]  
b chordmem: [73, 75, 82, 80] b deltamem [144.52894040700022, 144.5360197450002, 144.5319027680002, 144.5398714300002]  
average: 0.0036436743333278323  
b chordmem: [73, 75] b deltamem [145.5580106120002, 145.5658846950002]  
average: 0.00787408299999015  
chordmem: [73, 75] deltamem [145.5580106120002, 145.5658846950002]  
b chordmem: [73, 75, 82] b deltamem [145.5580106120002, 145.5658846950002, 145.5599041100002]  
average: 0.0009467489999934742  
chordmem: [73, 75, 82] deltamem [145.5580106120002, 145.5658846950002, 145.5599041100002]  
identity  
[0]  
b chordmem: [73, 75, 82, 80] b deltamem [145.5580106120002, 145.5658846950002, 145.5599041100002, 145.5699116380002]  
average: 0.003967008666667955  
b chordmem: [73, 75] b deltamem [146.49602115700026, 146.50301704100028]  
average: 0.006995884000019714  
chordmem: [73, 75] deltamem [146.49602115700026, 146.50301704100028]  
b chordmem: [73, 75, 82] b deltamem [146.49602115700026, 146.50301704100028, 146.50167091200026]  
average: 0.0028248775000037085  
chordmem: [73, 75, 82] deltamem [146.49602115700026, 146.50301704100028, 146.50167091200026]  
identity  
[0]  
b chordmem: [73, 75, 82, 80] b deltamem [146.49602115700026, 146.50301704100028, 146.50167091200026, 146.50706532700028]  
average: 0.0036813900000064828  
b chordmem: [73, 75] b deltamem [146.73804665200026, 146.74693420300025]  
average: 0.008887550999986615  
chordmem: [73, 75] deltamem [146.73804665200026, 146.74693420300025]



b chordmem: [73, 75, 82] b deltamem [146.73804665200026,  
146.74693420300025, 146.74993004300026]  
average: 0.0059416954999989  
chordmem: [73, 75, 82] deltamem [146.73804665200026,  
146.74693420300025, 146.74993004300026]  
identity  
[0]  
b chordmem: [73, 75, 82, 80] b deltamem [146.73804665200026,  
146.74693420300025, 146.74993004300026, 146.76493886100027]  
average: 0.008964069666670108  
b chordmem: [73, 75] b deltamem [147.7668750050003,  
147.77699265500027]  
average: 0.010117649999983769  
chordmem: [73, 75] deltamem [147.7668750050003, 147.77699265500027]  
b chordmem: [73, 75, 80] b deltamem [147.7668750050003,  
147.77699265500027, 147.78303147500026]  
average: 0.008078234999985057  
chordmem: [73, 75, 80] deltamem [147.7668750050003,  
147.77699265500027, 147.78303147500026]  
b chordmem: [73, 75, 80, 82] b deltamem [147.7668750050003,  
147.77699265500027, 147.78303147500026, 147.77406253700028]  
average: 0.0023958439999963352  
identity  
[0]  
b chordmem: [75, 73] b deltamem [148.2980164150002,  
148.2861811520002]  
average: -0.011835262999994711  
chordmem: [75, 73] deltamem [148.2980164150002, 148.2861811520002]  
b chordmem: [75, 73, 82] b deltamem [148.2980164150002,  
148.2861811520002, 148.2943474390002]  
average: -0.0018344880000000785  
chordmem: [75, 73, 82] deltamem [148.2980164150002,  
148.2861811520002, 148.2943474390002]  
identity  
[0, 0]  
b chordmem: [75, 73, 82, 80] b deltamem [148.2980164150002,  
148.2861811520002, 148.2943474390002, 148.2911052000002]  
average: -0.002303738333334119  
b chordmem: [73, 75] b deltamem [148.5110922100002,  
148.5259923810002]  
average: 0.014900170999993634  
chordmem: [73, 75] deltamem [148.5110922100002, 148.5259923810002]  
b chordmem: [73, 75, 82] b deltamem [148.5110922100002,  
148.5259923810002, 148.5220572970002]  
average: 0.005482543499994108  
chordmem: [73, 75, 82] deltamem [148.5110922100002,  
148.5259923810002, 148.5220572970002]  
identity  
[0]  
b chordmem: [73, 75, 82, 80] b deltamem [148.5110922100002,  
148.5259923810002, 148.5220572970002, 148.5340861020002]  
average: 0.007664630666662712  
b chordmem: [73, 75] b deltamem [149.99019416500016,  
149.99708910500016]

average: 0.006894939999995131  
chordmem: [73, 75] deltamem [149.99019416500016,  
149.99708910500016]  
b chordmem: [73, 75, 82] b deltamem [149.99019416500016,  
149.99708910500016, 149.99302625400017]  
average: 0.001416044500004432  
chordmem: [73, 75, 82] deltamem [149.99019416500016,  
149.99708910500016, 149.99302625400017]  
identity  
[0]  
b chordmem: [73, 75, 82, 80] b deltamem [149.99019416500016,  
149.99708910500016, 149.99302625400017, 150.00707648200014]  
average: 0.005627438999994183  
b chordmem: [73, 75] b deltamem [153.48509603700018,  
153.48700152500018]  
average: 0.0019054880000055618  
chordmem: [73, 75] deltamem [153.48509603700018,  
153.48700152500018]  
b chordmem: [73, 75, 82] b deltamem [153.48509603700018,  
153.48700152500018, 153.49107444600017]  
average: 0.002989204499996845  
chordmem: [73, 75, 82] deltamem [153.48509603700018,  
153.48700152500018, 153.49107444600017]  
identity  
[0]  
b chordmem: [73, 75, 82, 80] b deltamem [153.48509603700018,  
153.48700152500018, 153.49107444600017, 153.49710304500016]  
average: 0.004002335999994481  
b chordmem: [73, 75] b deltamem [155.53294442500018,  
155.53900662500018]  
average: 0.00606220000002349  
chordmem: [73, 75] deltamem [155.53294442500018,  
155.53900662500018]  
b chordmem: [73, 75, 82] b deltamem [155.53294442500018,  
155.53900662500018, 155.53503648000017]  
average: 0.0010460274999957164  
chordmem: [73, 75, 82] deltamem [155.53294442500018,  
155.53900662500018, 155.53503648000017]  
identity  
[0]  
b chordmem: [73, 75, 82, 80] b deltamem [155.53294442500018,  
155.53900662500018, 155.53503648000017, 155.54292902500018]  
average: 0.00332819999999856  
go to next tree 2  
greater than  
b chordmem: [73, 75] b deltamem [158.4919331820002,  
158.4960365020002]  
average: 0.0041033200000129  
chordmem: [73, 75] deltamem [158.4919331820002, 158.4960365020002]  
evaluate!  
[]  
b chordmem: [73, 75, 82] b deltamem [158.4919331820002,  
158.4960365020002, 158.4890456650002]  
average: -0.0014437585000024455

chordmem: [73, 75, 82] deltamem [158.4919331820002,  
158.4960365020002, 158.4890456650002]  
b chordmem: [73, 75, 82, 80] b deltamem [158.4919331820002,  
158.4960365020002, 158.4890456650002, 158.49885642200022]  
average: 0.002307746666673438  
greater than  
b chordmem: [73, 75] b deltamem [161.98410931200021,  
161.99211158200023]  
average: 0.008002270000019962  
chordmem: [73, 75] deltamem [161.98410931200021,  
161.99211158200023]  
evaluate!  
[]  
b chordmem: [73, 75, 82] b deltamem [161.98410931200021,  
161.99211158200023, 161.98792859500023]  
average: 0.001909641500006387  
chordmem: [73, 75, 82] deltamem [161.98410931200021,  
161.99211158200023, 161.98792859500023]  
b chordmem: [73, 75, 82, 80] b deltamem [161.98410931200021,  
161.99211158200023, 161.98792859500023, 161.99610463500022]  
average: 0.00399844100000261  
greater than  
b chordmem: [73, 82] b deltamem [164.9849334370001,  
164.9880090020001]  
average: 0.0030755649999889556  
chordmem: [73, 82] deltamem [164.9849334370001, 164.9880090020001]  
b chordmem: [73, 82, 75] b deltamem [164.9849334370001,  
164.9880090020001, 164.9940284580001]  
average: 0.004547510499989471  
chordmem: [73, 82, 75] deltamem [164.9849334370001,  
164.9880090020001, 164.9940284580001]  
evaluate!  
[]  
b chordmem: [73, 82, 75, 80] b deltamem [164.9849334370001,  
164.9880090020001, 164.9940284580001, 165.00303799000008]  
average: 0.006034850999990719  
evaluate!  
[]  
b chordmem: [75, 82] b deltamem [167.2600304820001,  
167.2640331600001]  
average: 0.004002678000006199  
chordmem: [75, 82] deltamem [167.2600304820001, 167.2640331600001]  
b chordmem: [75, 82, 80] b deltamem [167.2600304820001,  
167.2640331600001, 167.26702140500012]  
average: 0.0034954615000089007  
chordmem: [75, 82, 80] deltamem [167.2600304820001,  
167.2640331600001, 167.26702140500012]  
b chordmem: [75, 82, 80] b deltamem [167.2640331600001,  
167.26702140500012, 168.31494676200012, 168.29099431700013]  
average: 0.34232038566667217  
chordmem: [82, 80] deltamem [167.26702140500012,  
168.31494676200012, 168.29099431700013]  
evaluate!  
[]

```
evaluate!  
[]  
b chordmem: [82, 80, 75] b deltamem [168.31494676200012,  
168.29099431700013, 168.78905266500013, 168.78502093000012]  
average: 0.15669138933333215  
chordmem: [80, 75] deltamem [168.29099431700013,  
168.78905266500013, 168.78502093000012]  
b chordmem: [80, 75, 82] b deltamem [168.29099431700013,  
168.78905266500013, 168.78502093000012, 168.79199155200013]  
average: 0.16699907833333327  
chordmem: [75, 82] deltamem [168.78905266500013,  
168.78502093000012, 168.79199155200013]  
b chordmem: [75, 82, 85] b deltamem [168.78905266500013,  
168.78502093000012, 168.79199155200013, 168.77004548700012]  
average: -0.006335726000003206  
chordmem: [75, 82, 85] deltamem [168.78905266500013,  
168.78502093000012, 168.79199155200013, 168.77004548700012]  
b chordmem: [75, 82, 85, 80] b deltamem [168.78502093000012,  
168.79199155200013, 168.77004548700012, 169.77690206000008,  
169.7751383220001]  
average: 0.24752934799999338  
chordmem: [82, 85, 80] deltamem [168.79199155200013,  
168.77004548700012, 169.77690206000008, 169.7751383220001]  
b chordmem: [82, 85, 80] b deltamem [168.77004548700012,  
169.77690206000008, 169.7751383220001, 169.7610877600001]  
average: 0.33034742433332553  
chordmem: [85, 80] deltamem [169.77690206000008, 169.7751383220001,  
169.7610877600001]  
b chordmem: [85, 80, 75] b deltamem [169.7751383220001,  
169.7610877600001, 170.02093461000007, 170.02598109200008]  
average: 0.08361425666666378  
chordmem: [80, 75] deltamem [169.7610877600001, 170.02093461000007,  
170.02598109200008]  
evaluate!  
[]  
b chordmem: [80, 75, 85, 87] b deltamem [170.02093461000007,  
170.02598109200008, 170.5420452970001, 170.5449871960001]  
average: 0.1746841953333463  
chordmem: [75, 85, 87] deltamem [170.02598109200008,  
170.5420452970001, 170.5449871960001]  
b chordmem: [75, 85, 87, 80] b deltamem [170.5420452970001,  
170.5449871960001, 171.01601004500017, 171.00795783200016]  
average: 0.15530417833335264  
chordmem: [85, 87, 80] deltamem [170.5449871960001,  
171.01601004500017, 171.00795783200016]  
evaluate!  
[]  
b chordmem: [85, 87, 80] b deltamem [171.01601004500017,  
171.00795783200016, 171.77808384000016, 171.78205478000015]  
average: 0.2553482449999933  
chordmem: [87, 80] deltamem [171.00795783200016,  
171.77808384000016, 171.78205478000015]  
b chordmem: [87, 80, 92] b deltamem [171.00795783200016,  
171.77808384000016, 171.78205478000015, 171.78593978000015]
```

average: 0.2593273159999967  
chordmem: [80, 92] deltamem [171.77808384000016,  
171.78205478000015, 171.78593978000015]  
b chordmem: [80, 92, 94] b deltamem [171.77808384000016,  
171.78205478000015, 171.78593978000015, 171.77493739700017]  
average: -0.0010488143333304834  
chordmem: [80, 92, 94] deltamem [171.77808384000016,  
171.78205478000015, 171.78593978000015, 171.77493739700017]  
greater than  
b chordmem: [80, 92, 94, 73] b deltamem [171.78205478000015,  
171.78593978000015, 171.77493739700017, 172.36209084700016,  
172.35907398200015]  
average: 0.1442548005000006  
chordmem: [92, 94, 73] deltamem [171.78593978000015,  
171.77493739700017, 172.36209084700016, 172.35907398200015]  
b chordmem: [94, 73, 85, 87] b deltamem [171.77493739700017,  
172.36209084700016, 172.35907398200015, 172.82406911700014,  
172.82806112200012]  
average: 0.2632809312499873  
chordmem: [73, 85, 87] deltamem [172.36209084700016,  
172.35907398200015, 172.82406911700014, 172.82806112200012]  
b chordmem: [73, 85, 87, 92] b deltamem [172.35907398200015,  
172.82406911700014, 172.82806112200012, 172.83195614500013]  
average: 0.15762738766665998  
chordmem: [85, 87, 92] deltamem [172.82406911700014,  
172.82806112200012, 172.83195614500013]  
b chordmem: [85, 87, 92, 94] b deltamem [172.82406911700014,  
172.82806112200012, 172.83195614500013, 172.82105317200015]  
average: -0.0010053149999957138  
b chordmem: [80, 82] b deltamem [173.30507140200015,  
173.29295374700015]  
average: -0.012117654999997285  
chordmem: [80, 82] deltamem [173.30507140200015,  
173.29295374700015]  
b chordmem: [80, 82] b deltamem [173.30507140200015,  
173.29295374700015, 175.01009669500016, 175.02110905700016]  
average: 0.5720125516666693  
chordmem: [82] deltamem [173.29295374700015, 175.01009669500016,  
175.02110905700016]  
b chordmem: [82, 80, 73] b deltamem [173.29295374700015,  
175.01009669500016, 175.02110905700016, 175.01510930700016]  
average: 0.5740518533333349  
chordmem: [80, 73] deltamem [175.01009669500016,  
175.02110905700016, 175.01510930700016]  
greater than  
b chordmem: [80, 73, 71, 75] b deltamem [175.02110905700016,  
175.01510930700016, 175.77101046200016, 175.77807227200014]  
average: 0.25232107166666157  
chordmem: [73, 71, 75] deltamem [175.01510930700016,  
175.77101046200016, 175.77807227200014]  
evaluate!  
[]  
b chordmem: [73, 71, 75, 82] b deltamem [175.01510930700016,  
175.77101046200016, 175.77807227200014, 175.77408831700015]

average: 0.2529930033333301  
chordmem: [71, 75, 82] deltamem [175.77101046200016,  
175.77807227200014, 175.77408831700015]  
b chordmem: [71, 75, 82, 80] b deltamem [175.77101046200016,  
175.77807227200014, 175.77408831700015, 175.78107966500014]  
average: 0.003356400999990683  
evaluate!  
[]  
b chordmem: [75, 82] b deltamem [177.26692478700016,  
177.26303859700016]  
average: -0.003886190000002898  
chordmem: [75, 82] deltamem [177.26692478700016,  
177.26303859700016]  
b chordmem: [75, 82, 80] b deltamem [177.26692478700016,  
177.26303859700016, 177.27001548500016]  
average: 0.0015453489999970316  
chordmem: [75, 82, 80] deltamem [177.26692478700016,  
177.26303859700016, 177.27001548500016]  
evaluate!  
[]  
b chordmem: [75, 82, 80] b deltamem [177.26303859700016,  
177.27001548500016, 178.47297629500014, 178.48100324200013]  
average: 0.4059882149999889  
chordmem: [82, 80] deltamem [177.27001548500016,  
178.47297629500014, 178.48100324200013]  
b chordmem: [82, 80] b deltamem [177.27001548500016,  
178.47297629500014, 178.48100324200013, 178.47608939700012]  
average: 0.4020246373333218  
chordmem: [80] deltamem [178.47297629500014, 178.48100324200013,  
178.47608939700012]  
evaluate!  
[]  
b chordmem: [80, 75, 82] b deltamem [178.48100324200013,  
178.47608939700012, 179.44207461700012, 179.44893943200012]  
average: 0.322645396666663  
chordmem: [75, 82] deltamem [178.47608939700012,  
179.44207461700012, 179.44893943200012]  
b chordmem: [75, 82, 80] b deltamem [178.47608939700012,  
179.44207461700012, 179.44893943200012, 179.45993447000012]  
average: 0.3279483576666659  
chordmem: [82, 80] deltamem [179.44207461700012,  
179.44893943200012, 179.45993447000012]  
b chordmem: [82, 80, 71, 75] b deltamem [179.44893943200012,  
179.45993447000012, 180.53803805000013, 180.54604340000012]  
average: 0.36570132266666633  
chordmem: [80, 71, 75] deltamem [179.45993447000012,  
180.53803805000013, 180.54604340000012]  
evaluate!  
[]  
b chordmem: [80, 71, 75, 82] b deltamem [179.45993447000012,  
180.53803805000013, 180.54604340000012, 180.53505342200012]  
average: 0.35837298399999895  
chordmem: [71, 75, 82] deltamem [180.53803805000013,  
180.54604340000012, 180.53505342200012]

b chordmem: [71, 75, 82, 80] b deltamem [180.53803805000013, 180.54604340000012, 180.53505342200012, 180.54095873500012]  
average: 0.0009735616666641059  
b chordmem: [69, 68] b deltamem [181.3000416720001, 181.30404155700012]  
average: 0.003999885000013137  
chordmem: [69, 68] deltamem [181.3000416720001, 181.30404155700012]  
b chordmem: [69, 68, 61] b deltamem [181.3000416720001, 181.30404155700012, 181.29708004200012]  
average: -0.0014808149999936404  
chordmem: [69, 68, 61] deltamem [181.3000416720001, 181.30404155700012, 181.29708004200012]  
greater than  
b chordmem: [68, 61, 73, 75] b deltamem [181.30404155700012, 181.29708004200012, 181.84508901500013, 181.85194127000014]  
average: 0.18263323766667364  
chordmem: [61, 73, 75] deltamem [181.29708004200012, 181.84508901500013, 181.85194127000014]  
evaluate!  
[]  
b chordmem: [61, 73, 75, 80] b deltamem [181.29708004200012, 181.84508901500013, 181.85194127000014, 181.86202564200013]  
average: 0.18831520000000523  
chordmem: [73, 75, 80] deltamem [181.84508901500013, 181.85194127000014, 181.86202564200013]  
b chordmem: [73, 75, 80, 82] b deltamem [181.84508901500013, 181.85194127000014, 181.86202564200013, 181.84906033000013]  
average: 0.001323771666667047  
evaluate!  
[]  
b chordmem: [75, 80] b deltamem [183.05108506500017, 183.07024530200016]  
average: 0.01916023699999414  
chordmem: [75, 80] deltamem [183.05108506500017, 183.07024530200016]  
b chordmem: [75, 80, 82] b deltamem [183.05108506500017, 183.07024530200016, 183.05614939700015]  
average: 0.0025321659999946178  
chordmem: [75, 80, 82] deltamem [183.05108506500017, 183.07024530200016, 183.05614939700015]  
evaluate!  
[]  
b chordmem: [75, 80, 82] b deltamem [183.07024530200016, 183.05614939700015, 183.28025306500015, 183.29620341500015]  
average: 0.07531937099999671  
chordmem: [80, 82] deltamem [183.05614939700015, 183.28025306500015, 183.29620341500015]  
b chordmem: [80, 82] b deltamem [183.05614939700015, 183.28025306500015, 183.29620341500015, 183.31011477000015]  
average: 0.08465512433333326  
chordmem: [82] deltamem [183.28025306500015, 183.29620341500015, 183.31011477000015]  
evaluate!  
[]

b chordmem: [82, 75, 80] b deltamem [183.29620341500015, 183.31011477000015, 183.77803781700015, 183.78413079500015]  
average: 0.1626424600000007  
chordmem: [75, 80] deltamem [183.31011477000015, 183.77803781700015, 183.78413079500015]  
b chordmem: [75, 80, 82] b deltamem [183.31011477000015, 183.77803781700015, 183.78413079500015, 183.77217269700014]  
average: 0.154019308999999647  
chordmem: [80, 82] deltamem [183.77803781700015, 183.78413079500015, 183.77217269700014]  
evaluate!  
[]  
b chordmem: [80, 82, 75] b deltamem [183.78413079500015, 183.77217269700014, 184.50205099000013, 184.51225920500013]  
average: 0.24270946999999941  
chordmem: [82, 75] deltamem [183.77217269700014, 184.50205099000013, 184.51225920500013]  
b chordmem: [82, 75, 80] b deltamem [183.77217269700014, 184.50205099000013, 184.51225920500013, 184.50611213000013]  
average: 0.24464647766666303  
chordmem: [75, 80] deltamem [184.50205099000013, 184.51225920500013, 184.50611213000013]  
evaluate!  
[]  
evaluate!  
[]  
b chordmem: [75, 80, 87, 85] b deltamem [184.51225920500013, 184.50611213000013, 186.98588136200013, 186.98106672200012]  
average: 0.82293583899999959  
chordmem: [80, 87, 85] deltamem [184.50611213000013, 186.98588136200013, 186.98106672200012]  
b chordmem: [80, 87, 85, 92] b deltamem [184.50611213000013, 186.98588136200013, 186.98106672200012, 186.99006242200014]  
average: 0.8279834306666677  
chordmem: [87, 85, 92] deltamem [186.98588136200013, 186.98106672200012, 186.99006242200014]  
b chordmem: [87, 85, 92, 94] b deltamem [186.98588136200013, 186.98106672200012, 186.99006242200014, 186.97801778500013]  
average: -0.002621192333331616  
b chordmem: [85, 87] b deltamem [187.23408217200014, 187.24606478200016]  
average: 0.011982610000018212  
chordmem: [85, 87] deltamem [187.23408217200014, 187.24606478200016]  
b chordmem: [85, 87, 94] b deltamem [187.23408217200014, 187.24606478200016, 187.23693109000016]  
average: 0.0014244590000060953  
chordmem: [85, 87, 94] deltamem [187.23408217200014, 187.24606478200016, 187.23693109000016]  
b chordmem: [85, 87, 94, 92] b deltamem [187.23408217200014, 187.24606478200016, 187.23693109000016, 187.24090129500016]  
average: 0.00227304100000462  
b chordmem: [87, 85] b deltamem [187.74729728000017, 187.73305452500017]



average: -0.014242754999997942  
chordmem: [87, 85] deltamem [187.74729728000017,  
187.73305452500017]  
b chordmem: [87, 85, 92] b deltamem [187.74729728000017,  
187.73305452500017, 187.74890207500016]  
average: 0.0008023974999957773  
chordmem: [87, 85, 92] deltamem [187.74729728000017,  
187.73305452500017, 187.74890207500016]  
b chordmem: [87, 85, 92, 94] b deltamem [187.74729728000017,  
187.73305452500017, 187.74890207500016, 187.74018330700017]  
average: -0.0023713243333342384  
b chordmem: [87, 85] b deltamem [188.25509188200022,  
188.24007658500022]  
average: -0.015015296999990824  
chordmem: [87, 85] deltamem [188.25509188200022,  
188.24007658500022]  
b chordmem: [87, 85, 94] b deltamem [188.25509188200022,  
188.24007658500022, 188.24301625200022]  
average: -0.006037814999999114  
chordmem: [87, 85, 94] deltamem [188.25509188200022,  
188.24007658500022, 188.24301625200022]  
b chordmem: [87, 85, 94, 92] b deltamem [188.25509188200022,  
188.24007658500022, 188.24301625200022, 188.25109303500022]  
average: -0.0013329489999970672  
b chordmem: [87, 85] b deltamem [188.7470020920002,  
188.73505371200022]  
average: -0.011948379999978442  
chordmem: [87, 85] deltamem [188.7470020920002, 188.73505371200022]  
b chordmem: [87, 85, 92] b deltamem [188.7470020920002,  
188.73505371200022, 188.7410540920002]  
average: -0.00297399999994703  
chordmem: [87, 85, 92] deltamem [188.7470020920002,  
188.73505371200022, 188.7410540920002]  
b chordmem: [87, 85, 92, 94] b deltamem [188.7470020920002,  
188.73505371200022, 188.7410540920002, 188.73206198200023]  
average: -0.004980036666656436  
b chordmem: [87, 85] b deltamem [189.24693375000018,  
189.2331205720002]  
average: -0.013813177999992376  
chordmem: [87, 85] deltamem [189.24693375000018, 189.2331205720002]  
b chordmem: [87, 85, 92] b deltamem [189.24693375000018,  
189.2331205720002, 189.2420711200002]  
average: -0.002431314999995493  
chordmem: [87, 85, 92] deltamem [189.24693375000018,  
189.2331205720002, 189.2420711200002]  
b chordmem: [87, 85, 92, 94] b deltamem [189.24693375000018,  
189.2331205720002, 189.2420711200002, 189.23598432700018]  
average: -0.0036498076666665233  
b chordmem: [87, 85] b deltamem [189.74790466600018,  
189.72493571500019]  
average: -0.02296895099999574  
chordmem: [87, 85] deltamem [189.74790466600018,  
189.72493571500019]  
b chordmem: [87, 85, 94] b deltamem [189.74790466600018,

189.72493571500019, 189.7320606100002]  
average: -0.007922027999995862  
chordmem: [87, 85, 94] deltamem [189.74790466600018,  
189.72493571500019, 189.7320606100002]  
b chordmem: [87, 85, 94, 92] b deltamem [189.74790466600018,  
189.72493571500019, 189.7320606100002, 189.73904102500018]  
average: -0.0029545470000016394  
compare: ['C#6', 'D#6', 'G#6', 'A#6']  
😞 ostinato was not developed correctly. Please try again  
first: ['C#5', 'D#5', 'G#5', 'A#5'] compare: ['C#6', 'D#6', 'G#6',  
'A#6']  
b chordmem: [87, 85] b deltamem [190.00386880200017,  
189.98793857200016]  
average: -0.01593023000000926  
chordmem: [87, 85] deltamem [190.00386880200017,  
189.98793857200016]  
b chordmem: [87, 85, 94] b deltamem [190.00386880200017,  
189.98793857200016, 189.99286378000016]  
average: -0.005502511000003096  
chordmem: [87, 85, 94] deltamem [190.00386880200017,  
189.98793857200016, 189.99286378000016]  
b chordmem: [87, 85, 94, 92] b deltamem [190.00386880200017,  
189.98793857200016, 189.99286378000016, 190.0719839850002]  
average: 0.022705061000010573  
b chordmem: [85, 87] b deltamem [190.48005414700023,  
190.48994030500023]  
average: 0.009886158000000478  
chordmem: [85, 87] deltamem [190.48005414700023,  
190.48994030500023]  
b chordmem: [85, 87, 94] b deltamem [190.48005414700023,  
190.48994030500023, 190.48608612500024]  
average: 0.0030159890000049927  
chordmem: [85, 87, 94] deltamem [190.48005414700023,  
190.48994030500023, 190.48608612500024]  
b chordmem: [85, 87, 94, 92] b deltamem [190.48005414700023,  
190.48994030500023, 190.48608612500024, 190.49510211700024]  
average: 0.005015990000003967  
b chordmem: [85, 87] b deltamem [190.9778722700003,  
190.99106901700029]  
average: 0.013196746999994957  
chordmem: [85, 87] deltamem [190.9778722700003, 190.99106901700029]  
b chordmem: [85, 87, 94] b deltamem [190.9778722700003,  
190.99106901700029, 190.9820417070003]  
average: 0.002084718500000804  
chordmem: [85, 87, 94] deltamem [190.9778722700003,  
190.99106901700029, 190.9820417070003]  
b chordmem: [85, 87, 94, 92] b deltamem [190.9778722700003,  
190.99106901700029, 190.9820417070003, 190.9850441570003]  
average: 0.0023906289999994592  
b chordmem: [85, 87] b deltamem [191.51701567000026,  
191.53114457000027]  
average: 0.014128900000002886  
chordmem: [85, 87] deltamem [191.51701567000026,  
191.53114457000027]

b chordmem: [85, 87, 94] b deltamem [191.51701567000026,  
191.53114457000027, 191.52117712700027]  
average: 0.002080728500004625  
chordmem: [85, 87, 94] deltamem [191.51701567000026,  
191.53114457000027, 191.52117712700027]  
b chordmem: [85, 87, 94, 92] b deltamem [191.51701567000026,  
191.53114457000027, 191.52117712700027, 191.52709188600028]  
average: 0.003358738666671949  
b chordmem: [85, 87] b deltamem [192.00516744200027,  
192.01312238000028]  
average: 0.00795493800001168  
chordmem: [85, 87] deltamem [192.00516744200027,  
192.01312238000028]  
b chordmem: [85, 87, 94] b deltamem [192.00516744200027,  
192.01312238000028, 192.00208174700026]  
average: -0.0015428475000049957  
chordmem: [85, 87, 94] deltamem [192.00516744200027,  
192.01312238000028, 192.00208174700026]  
b chordmem: [85, 87, 94, 92] b deltamem [192.00516744200027,  
192.01312238000028, 192.00208174700026, 192.00956207200028]  
average: 0.0014648766666690942  
b chordmem: [87, 92] b deltamem [192.24718272700028,  
192.26596038700026]  
average: 0.018777659999983598  
chordmem: [87, 92] deltamem [192.24718272700028,  
192.26596038700026]  
b chordmem: [87, 92, 85, 94] b deltamem [192.24718272700028,  
192.26596038700026, 192.23521211200028, 192.25355200000027]  
average: 0.002123090999996672  
b chordmem: [85, 87] b deltamem [192.71710487500025,  
192.72800419000023]  
average: 0.010899314999988974  
chordmem: [85, 87] deltamem [192.71710487500025,  
192.72800419000023]  
b chordmem: [85, 87, 94] b deltamem [192.71710487500025,  
192.72800419000023, 192.72406296700024]  
average: 0.0034790459999953782  
chordmem: [85, 87, 94] deltamem [192.71710487500025,  
192.72800419000023, 192.72406296700024]  
b chordmem: [85, 87, 94, 92] b deltamem [192.71710487500025,  
192.72800419000023, 192.72406296700024, 192.73203856000023]  
average: 0.004977894999996124  
b chordmem: [87, 85] b deltamem [193.49692756000024,  
193.48209057700024]  
average: -0.01483698300000924  
chordmem: [87, 85] deltamem [193.49692756000024,  
193.48209057700024]  
b chordmem: [87, 85, 94] b deltamem [193.49692756000024,  
193.48209057700024, 193.49011987500023]  
average: -0.003403842500006249  
chordmem: [87, 85, 94] deltamem [193.49692756000024,  
193.48209057700024, 193.49011987500023]  
b chordmem: [87, 85, 94, 92] b deltamem [193.49692756000024,  
193.48209057700024, 193.49011987500023, 193.48593195500024]

average: -0.003665201666668357  
b chordmem: [87, 85] b deltamem [193.99108784700024,  
193.97105358000022]  
average: -0.020034267000028194  
chordmem: [87, 85] deltamem [193.99108784700024,  
193.97105358000022]  
b chordmem: [87, 85, 94] b deltamem [193.99108784700024,  
193.97105358000022, 193.98326044700022]  
average: -0.0039137000000124544  
chordmem: [87, 85, 94] deltamem [193.99108784700024,  
193.97105358000022, 193.98326044700022]  
b chordmem: [87, 85, 94, 92] b deltamem [193.99108784700024,  
193.97105358000022, 193.98326044700022, 193.98702967200023]  
average: -0.0013527250000038293  
b chordmem: [87, 85] b deltamem [194.48210783000025,  
194.46728939500025]  
average: -0.014818434999995134  
chordmem: [87, 85] deltamem [194.48210783000025,  
194.46728939500025]  
b chordmem: [87, 85, 94] b deltamem [194.48210783000025,  
194.46728939500025, 194.47810069200025]  
average: -0.002003568999995764  
chordmem: [87, 85, 94] deltamem [194.48210783000025,  
194.46728939500025, 194.47810069200025]  
b chordmem: [87, 85, 94, 92] b deltamem [194.48210783000025,  
194.46728939500025, 194.47810069200025, 194.47402373000025]  
average: -0.0026946999999969043  
addition  
b chordmem: [85, 87] b deltamem [195.47592409200027,  
195.48335507600027]  
average: 0.007430983999995533  
chordmem: [85, 87] deltamem [195.47592409200027,  
195.48335507600027]  
b chordmem: [85, 87, 94] b deltamem [195.47592409200027,  
195.48335507600027, 195.47903258000028]  
average: 0.0015542440000047009  
chordmem: [85, 87, 94] deltamem [195.47592409200027,  
195.48335507600027, 195.47903258000028]  
b chordmem: [85, 87, 94, 92] b deltamem [195.47592409200027,  
195.48335507600027, 195.47903258000028, 195.48797947800026]  
average: 0.0040184619999953  
greater than  
b chordmem: [85, 87] b deltamem [196.4809386600002,  
196.4909678270002]  
average: 0.010029166999999006  
chordmem: [85, 87] deltamem [196.4809386600002, 196.4909678270002]  
b chordmem: [85, 87, 94] b deltamem [196.4809386600002,  
196.4909678270002, 196.48809584700018]  
average: 0.0035785934999950086  
chordmem: [85, 87, 94] deltamem [196.4809386600002,  
196.4909678270002, 196.48809584700018]  
b chordmem: [85, 87, 94, 92] b deltamem [196.4809386600002,  
196.4909678270002, 196.48809584700018, 196.4951052020002]  
average: 0.004722180666666039

b chordmem: [85, 87] b deltamem [197.2479553500002,  
197.25406380500021]  
average: 0.006108455000003232  
chordmem: [85, 87] deltamem [197.2479553500002, 197.25406380500021]  
b chordmem: [85, 87, 94] b deltamem [197.2479553500002,  
197.25406380500021, 197.25798337700022]  
average: 0.005014013500002079  
chordmem: [85, 87, 94] deltamem [197.2479553500002,  
197.25406380500021, 197.25798337700022]  
b chordmem: [85, 87, 94, 92] b deltamem [197.2479553500002,  
197.25406380500021, 197.25798337700022, 197.26101099800022]  
average: 0.004351882666668416  
b chordmem: [85, 87] b deltamem [197.76101223700027,  
197.77088712200026]  
average: 0.009874884999987898  
chordmem: [85, 87] deltamem [197.76101223700027,  
197.77088712200026]  
b chordmem: [85, 87, 94] b deltamem [197.76101223700027,  
197.77088712200026, 197.76810318200026]  
average: 0.003545472499993707  
chordmem: [85, 87, 94] deltamem [197.76101223700027,  
197.77088712200026, 197.76810318200026]  
b chordmem: [85, 87, 94, 92] b deltamem [197.76101223700027,  
197.77088712200026, 197.76810318200026, 197.77586191300026]  
average: 0.004949891999994331  
b chordmem: [85, 87] b deltamem [198.23400277500028,  
198.24006363500027]  
average: 0.006060859999990953  
chordmem: [85, 87] deltamem [198.23400277500028,  
198.24006363500027]  
b chordmem: [85, 87, 94] b deltamem [198.23400277500028,  
198.24006363500027, 198.24299102200027]  
average: 0.0044941234999953394  
chordmem: [85, 87, 94] deltamem [198.23400277500028,  
198.24006363500027, 198.24299102200027]  
b chordmem: [85, 87, 94, 92] b deltamem [198.23400277500028,  
198.24006363500027, 198.24299102200027, 198.24700924600026]  
average: 0.0043354903333276225  
b chordmem: [87, 85] b deltamem [198.7580517770003,  
198.7439538250003]  
average: -0.014097952000014402  
chordmem: [87, 85] deltamem [198.7580517770003, 198.7439538250003]  
b chordmem: [87, 85, 94] b deltamem [198.7580517770003,  
198.7439538250003, 198.7470181620003]  
average: -0.005516807500001164  
chordmem: [87, 85, 94] deltamem [198.7580517770003,  
198.7439538250003, 198.7470181620003]  
b chordmem: [87, 85, 94, 92] b deltamem [198.7580517770003,  
198.7439538250003, 198.7470181620003, 198.7619206850003]  
average: 0.001289635999995653  
b chordmem: [87, 85] b deltamem [199.01289657000032,  
199.0009546070003]  
average: -0.01194196300002659  
chordmem: [87, 85] deltamem [199.01289657000032, 199.0009546070003]

b chordmem: [87, 85, 94] b deltamem [199.01289657000032,  
199.0009546070003, 199.0088844970003]  
average: -0.002006036500006303  
chordmem: [87, 85, 94] deltamem [199.01289657000032,  
199.0009546070003, 199.0088844970003]  
b chordmem: [87, 85, 94, 92] b deltamem [199.01289657000032,  
199.0009546070003, 199.0088844970003, 199.02103477500032]  
average: 0.002712734999998171  
b chordmem: [87, 85] b deltamem [199.26889103800028,  
199.2509556720003]  
average: -0.017935365999989017  
chordmem: [87, 85] deltamem [199.26889103800028, 199.2509556720003]  
b chordmem: [87, 85, 94] b deltamem [199.26889103800028,  
199.2509556720003, 199.26407191200028]  
average: -0.002409563000000503  
chordmem: [87, 85, 94] deltamem [199.26889103800028,  
199.2509556720003, 199.26407191200028]  
b chordmem: [87, 85, 94, 92] b deltamem [199.26889103800028,  
199.2509556720003, 199.26407191200028, 199.26105040700028]  
average: -0.0026135436666644787  
b chordmem: [87, 85] b deltamem [199.50789712200026,  
199.49603326500025]  
average: -0.011863857000008693  
chordmem: [87, 85] deltamem [199.50789712200026,  
199.49603326500025]  
b chordmem: [87, 85, 94] b deltamem [199.50789712200026,  
199.49603326500025, 199.49996630500024]  
average: -0.003965408500008039  
chordmem: [87, 85, 94] deltamem [199.50789712200026,  
199.49603326500025, 199.49996630500024]  
b chordmem: [87, 85, 94, 92] b deltamem [199.50789712200026,  
199.49603326500025, 199.49996630500024, 199.50289937500025]  
average: -0.0016659156666681458  
b chordmem: [87, 85] b deltamem [199.74497358500022,  
199.73095866500023]  
average: -0.014014919999993936  
chordmem: [87, 85] deltamem [199.74497358500022,  
199.73095866500023]  
b chordmem: [87, 85, 94] b deltamem [199.74497358500022,  
199.73095866500023, 199.73960799500023]  
average: -0.0026827949999983502  
chordmem: [87, 85, 94] deltamem [199.74497358500022,  
199.73095866500023, 199.73960799500023]  
b chordmem: [87, 85, 94, 92] b deltamem [199.74497358500022,  
199.73095866500023, 199.73960799500023, 199.74101664500023]  
average: -0.0013189799999982672  
b chordmem: [87, 85] b deltamem [199.99191879300022,  
199.98003191500024]  
average: -0.011886877999984335  
chordmem: [87, 85] deltamem [199.99191879300022,  
199.98003191500024]  
b chordmem: [87, 85, 94] b deltamem [199.99191879300022,  
199.98003191500024, 199.98695318000023]  
average: -0.0024828064999979915

chordmem: [87, 85, 94] deltamem [199.99191879300022,  
199.98003191500024, 199.98695318000023]  
b chordmem: [87, 85, 94, 92] b deltamem [199.99191879300022,  
199.98003191500024, 199.98695318000023, 199.99593870300023]  
average: 0.0013399700000036319  
b chordmem: [87, 85] b deltamem [200.2290536520002,  
200.2119387200002]  
average: -0.017114931999998362  
chordmem: [87, 85] deltamem [200.2290536520002, 200.2119387200002]  
b chordmem: [87, 85, 94] b deltamem [200.2290536520002,  
200.2119387200002, 200.2251030050002]  
average: -0.0019753235000052882  
chordmem: [87, 85, 94] deltamem [200.2290536520002,  
200.2119387200002, 200.2251030050002]  
b chordmem: [87, 85, 94, 92] b deltamem [200.2290536520002,  
200.2119387200002, 200.2251030050002, 200.2220832420002]  
average: -0.0023234700000026955  
b chordmem: [87, 76] b deltamem [200.49691373800025,  
200.47088516600022]  
average: -0.026028572000029726  
chordmem: [87, 76] deltamem [200.49691373800025,  
200.47088516600022]  
dynamics: [104]  
successor  
b chordmem: [87, 76, 85] b deltamem [200.49691373800025,  
200.47088516600022, 200.48305263200024]  
average: -0.00693055300000367  
chordmem: [87, 76, 85] deltamem [200.49691373800025,  
200.47088516600022, 200.48305263200024]  
b chordmem: [87, 76, 85, 94] b deltamem [200.49691373800025,  
200.47088516600022, 200.48305263200024, 200.47902811000023]  
average: -0.00596187600000538  
b chordmem: [94, 92] b deltamem [200.47902811000023,  
200.48606222200024]  
average: 0.0070341120000136925  
chordmem: [94, 92] deltamem [200.47902811000023,  
200.48606222200024]  
b chordmem: [94, 92, 85, 87] b deltamem [200.47902811000023,  
200.48606222200024, 200.71806573200027, 200.73504979200027]  
average: 0.08534056066667972  
chordmem: [92, 85, 87] deltamem [200.48606222200024,  
200.71806573200027, 200.73504979200027]  
b chordmem: [92, 85, 87, 94] b deltamem [200.48606222200024,  
200.71806573200027, 200.73504979200027, 200.72968401500026]  
average: 0.08120726433333895  
chordmem: [85, 87, 94] deltamem [200.71806573200027,  
200.73504979200027, 200.72968401500026]  
b chordmem: [85, 87, 94, 92] b deltamem [200.71806573200027,  
200.73504979200027, 200.72968401500026, 200.73106754700026]  
average: 0.004333938333331844  
b chordmem: [85, 87] b deltamem [200.97289954200028,  
200.99508697500028]  
average: 0.022187432999999146  
chordmem: [85, 87] deltamem [200.97289954200028,

200.99508697500028]  
dynamics: [104, 110]  
successor  
b chordmem: [85, 87, 76, 94] b deltamem [200.97289954200028,  
200.99508697500028, 200.96095823700028, 200.98060804600027]  
average: 0.0025695013333309666  
b chordmem: [94, 92] b deltamem [200.98060804600027,  
200.97696278500027]  
average: -0.0036452610000026198  
chordmem: [94, 92] deltamem [200.98060804600027,  
200.97696278500027]  
b chordmem: [94, 92, 87, 85] b deltamem [200.98060804600027,  
200.97696278500027, 201.23999847000027, 201.2229125380003]  
average: 0.08076816400000553  
chordmem: [92, 87, 85] deltamem [200.97696278500027,  
201.23999847000027, 201.2229125380003]  
b chordmem: [92, 87, 85, 94] b deltamem [200.97696278500027,  
201.23999847000027, 201.2229125380003, 201.23603617700027]  
average: 0.08635779733333493  
chordmem: [87, 85, 94] deltamem [201.23999847000027,  
201.2229125380003, 201.23603617700027]  
b chordmem: [87, 85, 94, 92] b deltamem [201.23999847000027,  
201.2229125380003, 201.23603617700027, 201.23213072500027]  
average: -0.0026225816666662163  
b chordmem: [87, 85] b deltamem [201.48905983000023,  
201.47495912500025]  
average: -0.014100704999975733  
chordmem: [87, 85] deltamem [201.48905983000023,  
201.47495912500025]  
b chordmem: [87, 85, 76] b deltamem [201.48905983000023,  
201.47495912500025, 201.46658213000026]  
average: -0.011238849999983813  
chordmem: [87, 85, 76] deltamem [201.48905983000023,  
201.47495912500025, 201.46658213000026]  
dynamics: [104, 110, 106]  
successor  
b chordmem: [87, 85, 76, 94] b deltamem [201.48905983000023,  
201.47495912500025, 201.46658213000026, 201.47890983600024]  
average: -0.0033833313333294277  
b chordmem: [94, 92] b deltamem [201.47890983600024,  
201.48215215600024]  
average: 0.0032423199999982444  
chordmem: [94, 92] deltamem [201.47890983600024,  
201.48215215600024]  
b chordmem: [94, 92, 87, 85] b deltamem [201.47890983600024,  
201.48215215600024, 201.7347021600002, 201.7190138320002]  
average: 0.08003466533331978  
chordmem: [92, 87, 85] deltamem [201.48215215600024,  
201.7347021600002, 201.7190138320002]  
b chordmem: [92, 87, 85, 94] b deltamem [201.48215215600024,  
201.7347021600002, 201.7190138320002, 201.73008173600022]  
average: 0.08264319333332537  
chordmem: [87, 85, 94] deltamem [201.7347021600002,  
201.7190138320002, 201.73008173600022]



b chordmem: [87, 85, 94, 92] b deltamem [201.7347021600002,  
201.7190138320002, 201.73008173600022, 201.7270255450002]  
average: -0.002558871666669423  
b chordmem: [87, 85] b deltamem [201.97097616000025,  
201.95611512000022]  
average: -0.01486104000002797  
chordmem: [87, 85] deltamem [201.97097616000025,  
201.95611512000022]  
b chordmem: [87, 85, 76] b deltamem [201.97097616000025,  
201.95611512000022, 201.96673202500025]  
average: -0.0021220674999966604  
chordmem: [87, 85, 76] deltamem [201.97097616000025,  
201.95611512000022, 201.96673202500025]  
dynamics: [104, 110, 106, 107]  
successor  
b chordmem: [87, 85, 76, 94] b deltamem [201.97097616000025,  
201.95611512000022, 201.96673202500025, 201.96306658700024]  
average: -0.002636524333335425  
b chordmem: [94, 92] b deltamem [201.96306658700024,  
201.96000098700023]  
average: -0.0030656000000135464  
chordmem: [94, 92] deltamem [201.96306658700024,  
201.96000098700023]  
b chordmem: [94, 92, 87, 85] b deltamem [201.96306658700024,  
201.96000098700023, 202.23892058500022, 202.22707831000022]  
average: 0.08800390766666055  
chordmem: [92, 87, 85] deltamem [201.96000098700023,  
202.23892058500022, 202.22707831000022]  
b chordmem: [92, 87, 85, 94] b deltamem [201.96000098700023,  
202.23892058500022, 202.22707831000022, 202.2298928220002]  
average: 0.08996394499999383  
chordmem: [87, 85, 94] deltamem [202.23892058500022,  
202.22707831000022, 202.2298928220002]  
b chordmem: [87, 85, 94, 92] b deltamem [202.23892058500022,  
202.22707831000022, 202.2298928220002, 202.23390541700022]  
average: -0.0016717226666666345  
b chordmem: [87, 76] b deltamem [202.49389925700024,  
202.46692716500024]  
average: -0.026972091999994063  
chordmem: [87, 76] deltamem [202.49389925700024,  
202.46692716500024]  
dynamics: [104, 110, 106, 107, 105]  
successor  
b chordmem: [87, 76, 85] b deltamem [202.49389925700024,  
202.46692716500024, 202.47802100700025]  
average: -0.007939124999992941  
chordmem: [87, 76, 85] deltamem [202.49389925700024,  
202.46692716500024, 202.47802100700025]  
b chordmem: [87, 76, 85, 94] b deltamem [202.49389925700024,  
202.46692716500024, 202.47802100700025, 202.48109280000025]  
average: -0.004268818999994058  
b chordmem: [94, 92] b deltamem [202.48109280000025,  
202.48443189600025]  
average: 0.0033390959999906045

chordmem: [94, 92] deltamem [202.4810928000025,  
202.48443189600025]  
found ostinato! ['C#6', 'D#6', 'G#6', 'A#6']  
b chordmem: [94, 92, 87, 85] b deltamem [202.4810928000025,  
202.48443189600025, 202.73104840500025, 202.71398458200025]  
average: 0.07763059399999861  
chordmem: [92, 87, 85] deltamem [202.48443189600025,  
202.73104840500025, 202.71398458200025]  
b chordmem: [92, 87, 85] b deltamem [202.48443189600025,  
202.73104840500025, 202.71398458200025, 202.72406023500025]  
average: 0.07987611300000215  
chordmem: [87, 85] deltamem [202.73104840500025,  
202.71398458200025, 202.72406023500025]  
b chordmem: [87, 85, 92, 94] b deltamem [202.73104840500025,  
202.71398458200025, 202.72406023500025, 202.72109289200026]  
average: -0.0033185043333313993  
b chordmem: [85, 87] b deltamem [202.96605144200026,  
202.97903197800028]  
average: 0.012980536000014808  
chordmem: [85, 87] deltamem [202.96605144200026,  
202.97903197800028]  
b chordmem: [85, 87, 94] b deltamem [202.96605144200026,  
202.97903197800028, 202.97290254000026]  
average: 0.0034255489999992506  
chordmem: [85, 87, 94] deltamem [202.96605144200026,  
202.97903197800028, 202.97290254000026]  
b chordmem: [85, 87, 94, 92] b deltamem [202.96605144200026,  
202.97903197800028, 202.97290254000026, 202.98187402800028]  
average: 0.0052741953333337654  
b chordmem: [87, 85] b deltamem [203.22846128500026,  
203.20192630000025]  
average: -0.026534985000012057  
chordmem: [87, 85] deltamem [203.22846128500026,  
203.20192630000025]  
b chordmem: [87, 85, 94] b deltamem [203.22846128500026,  
203.20192630000025, 203.20906323500026]  
average: -0.009699025000003303  
chordmem: [87, 85, 94] deltamem [203.22846128500026,  
203.20192630000025, 203.20906323500026]  
b chordmem: [87, 85, 94, 92] b deltamem [203.22846128500026,  
203.20192630000025, 203.20906323500026, 203.20508279700024]  
average: -0.007792829333340023  
b chordmem: [87, 85] b deltamem [203.47986489500025,  
203.46305169000024]  
average: -0.016813205000005382  
chordmem: [87, 85] deltamem [203.47986489500025,  
203.46305169000024]  
b chordmem: [87, 85, 94] b deltamem [203.47986489500025,  
203.46305169000024, 203.46588828800023]  
average: -0.006988303500008897  
chordmem: [87, 85, 94] deltamem [203.47986489500025,  
203.46305169000024, 203.46588828800023]  
b chordmem: [87, 85, 94, 92] b deltamem [203.47986489500025,  
203.46305169000024, 203.46588828800023, 203.46887882800024]

average: -0.0036620223333348654  
b chordmem: [87, 85] b deltamem [203.71388035200025,  
203.69693208500024]  
average: -0.016948267000003625  
chordmem: [87, 85] deltamem [203.71388035200025,  
203.69693208500024]  
b chordmem: [87, 85, 94] b deltamem [203.71388035200025,  
203.69693208500024, 203.71003934200024]  
average: -0.0019205050000010715  
chordmem: [87, 85, 94] deltamem [203.71388035200025,  
203.69693208500024, 203.71003934200024]  
b chordmem: [87, 85, 94, 92] b deltamem [203.71388035200025,  
203.69693208500024, 203.71003934200024, 203.70698716600023]  
average: -0.002297728666671143  
b chordmem: [87, 85] b deltamem [203.98040187000024,  
203.95895184500023]  
average: -0.021450025000007145  
chordmem: [87, 85] deltamem [203.98040187000024,  
203.95895184500023]  
b chordmem: [87, 85, 94] b deltamem [203.98040187000024,  
203.95895184500023, 203.96305107000023]  
average: -0.008675400000001332  
chordmem: [87, 85, 94] deltamem [203.98040187000024,  
203.95895184500023, 203.96305107000023]  
b chordmem: [87, 85, 94, 92] b deltamem [203.98040187000024,  
203.95895184500023, 203.96305107000023, 203.97104893200023]  
average: -0.0031176460000021202  
b chordmem: [87, 85] b deltamem [204.23444104000023,  
204.20589651600025]  
average: -0.028544523999983085  
chordmem: [87, 85] deltamem [204.23444104000023,  
204.20589651600025]  
b chordmem: [87, 85, 94] b deltamem [204.23444104000023,  
204.20589651600025, 204.21503018500024]  
average: -0.009705427499994812  
chordmem: [87, 85, 94] deltamem [204.23444104000023,  
204.20589651600025, 204.21503018500024]  
b chordmem: [87, 85, 94, 92] b deltamem [204.23444104000023,  
204.20589651600025, 204.21503018500024, 204.22396365700024]  
average: -0.003492460999998078  
compare: ['C#6', 'D#6', 'G#6', 'A#6']  
ostinato did not change  
first: ['C#6', 'D#6', 'G#6', 'A#6'] compare: ['C#6', 'D#6', 'G#6',  
'A#6']  
dynamics: [104, 110, 106, 107, 105, 105]  
successor  
b chordmem: [76, 85] b deltamem [204.4689267750002,  
204.4780137250002]  
average: 0.00908695000001103  
chordmem: [76, 85] deltamem [204.4689267750002, 204.4780137250002]  
b chordmem: [76, 85, 94] b deltamem [204.4689267750002,  
204.4780137250002, 204.4810031200002]  
average: 0.006038172499998495  
chordmem: [76, 85, 94] deltamem [204.4689267750002,

204.4780137250002, 204.4810031200002]  
b chordmem: [76, 85, 94, 92] b deltamem [204.4689267750002,  
204.4780137250002, 204.4810031200002, 204.48909753500018]  
average: 0.0067235866666661656  
b chordmem: [87, 85] b deltamem [204.7209520430002,  
204.7040441220002]  
average: -0.01690792100001204  
chordmem: [87, 85] deltamem [204.7209520430002, 204.7040441220002]  
b chordmem: [87, 85, 94] b deltamem [204.7209520430002,  
204.7040441220002, 204.7070701350002]  
average: -0.006940954000000943  
chordmem: [87, 85, 94] deltamem [204.7209520430002,  
204.7040441220002, 204.7070701350002]  
b chordmem: [87, 85, 94, 92] b deltamem [204.7209520430002,  
204.7040441220002, 204.7070701350002, 204.7129478630002]  
average: -0.00266806000000012  
dynamics: [104, 110, 106, 107, 105, 105, 104]  
successor  
b chordmem: [76, 85] b deltamem [204.9570089670002,  
204.9710090700002]  
average: 0.014000103000000763  
chordmem: [76, 85] deltamem [204.9570089670002, 204.9710090700002]  
b chordmem: [76, 85, 94] b deltamem [204.9570089670002,  
204.9710090700002, 204.9750237570002]  
average: 0.009007394999997587  
chordmem: [76, 85, 94] deltamem [204.9570089670002,  
204.9710090700002, 204.9750237570002]  
b chordmem: [76, 85, 94, 92] b deltamem [204.9570089670002,  
204.9710090700002, 204.9750237570002, 204.9869115350002]  
average: 0.009967522666660974  
b chordmem: [87, 85] b deltamem [205.2200209550002,  
205.1951278350002]  
average: -0.024893120000001545  
chordmem: [87, 85] deltamem [205.2200209550002, 205.1951278350002]  
b chordmem: [87, 85, 92] b deltamem [205.2200209550002,  
205.1951278350002, 205.2050981900002]  
average: -0.007461382499997171  
chordmem: [87, 85, 92] deltamem [205.2200209550002,  
205.1951278350002, 205.2050981900002]  
b chordmem: [87, 85, 92, 94] b deltamem [205.2200209550002,  
205.1951278350002, 205.2050981900002, 205.2010554270002]  
average: -0.006321842666665134  
b chordmem: [87, 85] b deltamem [205.47890462500018,  
205.4589848420002]  
average: -0.019919782999977542  
chordmem: [87, 85] deltamem [205.47890462500018, 205.4589848420002]  
b chordmem: [87, 85, 94] b deltamem [205.47890462500018,  
205.4589848420002, 205.4619983620002]  
average: -0.008453131499990718  
chordmem: [87, 85, 94] deltamem [205.47890462500018,  
205.4589848420002, 205.4619983620002]  
b chordmem: [87, 85, 94, 92] b deltamem [205.47890462500018,  
205.4589848420002, 205.4619983620002, 205.4720523220002]  
average: -0.002284100999996023

b chordmem: [87, 85] b deltamem [205.71808473500016,  
205.70601696500015]  
average: -0.012067770000015798  
chordmem: [87, 85] deltamem [205.71808473500016,  
205.70601696500015]  
b chordmem: [87, 85, 74] b deltamem [205.71808473500016,  
205.70601696500015, 205.69701904000016]  
average: -0.010532847500002163  
chordmem: [87, 85, 74] deltamem [205.71808473500016,  
205.70601696500015, 205.69701904000016]  
identity  
succ head: 7  
rules now osc: [7]  
dynamics now: []  
b chordmem: [87, 85, 74, 92] b deltamem [205.71808473500016,  
205.70601696500015, 205.69701904000016, 205.71301697500016]  
average: -0.0016892533333342878  
found ostinato! ['C#6', 'D#6', 'G#6', 'A#6']  
b chordmem: [92, 94] b deltamem [205.71301697500016,  
205.70994632700015]  
average: -0.003070648000004894  
chordmem: [92, 94] deltamem [205.71301697500016,  
205.70994632700015]  
b chordmem: [92, 94, 87, 85] b deltamem [205.71301697500016,  
205.70994632700015, 205.97788148800015, 205.95796149500015]  
average: 0.08164817333333  
chordmem: [94, 87, 85] deltamem [205.70994632700015,  
205.97788148800015, 205.95796149500015]  
b chordmem: [94, 87, 85] b deltamem [205.70994632700015,  
205.97788148800015, 205.95796149500015, 205.96886133100014]  
average: 0.0863050013333293  
chordmem: [87, 85] deltamem [205.97788148800015,  
205.95796149500015, 205.96886133100014]  
b chordmem: [87, 85, 94, 92] b deltamem [205.97788148800015,  
205.95796149500015, 205.96886133100014, 205.96609325600014]  
average: -0.003929410666671629  
b chordmem: [87, 85] b deltamem [206.22603077500017,  
206.21113488200015]  
average: -0.014895893000016258  
chordmem: [87, 85] deltamem [206.22603077500017,  
206.21113488200015]  
b chordmem: [87, 85, 94] b deltamem [206.22603077500017,  
206.21113488200015, 206.21793796600016]  
average: -0.004046404500002154  
chordmem: [87, 85, 94] deltamem [206.22603077500017,  
206.21113488200015, 206.21793796600016]  
b chordmem: [87, 85, 94, 92] b deltamem [206.22603077500017,  
206.21113488200015, 206.21793796600016, 206.22190904600018]  
average: -0.0013739096666635457  
b chordmem: [87, 85] b deltamem [206.48513124700014,  
206.46887447200015]  
average: -0.01625677499998801  
chordmem: [87, 85] deltamem [206.48513124700014,  
206.46887447200015]

b chordmem: [87, 85, 94] b deltamem [206.48513124700014, 206.46887447200015, 206.46595069700015]  
average: -0.009590274999993653  
chordmem: [87, 85, 94] deltamem [206.48513124700014, 206.46887447200015, 206.46595069700015]  
b chordmem: [87, 85, 94, 92] b deltamem [206.48513124700014, 206.46887447200015, 206.46595069700015, 206.47899855500015]  
average: -0.0020442306666647405  
b chordmem: [85, 87] b deltamem [207.5509401720001, 207.55391711600012]  
average: 0.002976944000010917  
chordmem: [85, 87] deltamem [207.5509401720001, 207.55391711600012]  
b chordmem: [85, 87, 94] b deltamem [207.5509401720001, 207.55391711600012, 207.55689163300013]  
average: 0.002975730500011764  
chordmem: [85, 87, 94] deltamem [207.5509401720001, 207.55391711600012, 207.55689163300013]  
b chordmem: [85, 87, 94, 92] b deltamem [207.5509401720001, 207.55391711600012, 207.55689163300013, 207.56107486300013]  
average: 0.00337823033333396158  
b chordmem: [85, 87] b deltamem [208.28691938500015, 208.29292235300014]  
average: 0.006002967999990005  
chordmem: [85, 87] deltamem [208.28691938500015, 208.29292235300014]  
b chordmem: [85, 87, 94] b deltamem [208.28691938500015, 208.29292235300014, 208.28395464700014]  
average: -0.0014823690000014267  
chordmem: [85, 87, 94] deltamem [208.28691938500015, 208.29292235300014, 208.28395464700014]  
b chordmem: [85, 87, 94, 92] b deltamem [208.28691938500015, 208.29292235300014, 208.28395464700014, 208.29706965200015]  
average: 0.0033834223333334044  
b chordmem: [85, 87] b deltamem [208.80715677000015, 208.81301374000014]  
average: 0.005856969999996409  
chordmem: [85, 87] deltamem [208.80715677000015, 208.81301374000014]  
b chordmem: [85, 87, 94] b deltamem [208.80715677000015, 208.81301374000014, 208.80991332600016]  
average: 0.0013782780000042294  
chordmem: [85, 87, 94] deltamem [208.80715677000015, 208.81301374000014, 208.80991332600016]  
b chordmem: [85, 87, 94, 92] b deltamem [208.80715677000015, 208.81301374000014, 208.80991332600016, 208.81810001000014]  
average: 0.003647746666662973  
b chordmem: [85, 87] b deltamem [209.27564931000015, 209.28207724700016]  
average: 0.006427937000012207  
chordmem: [85, 87] deltamem [209.27564931000015, 209.28207724700016]  
b chordmem: [85, 87, 94] b deltamem [209.27564931000015, 209.28207724700016, 209.27919838200015]  
average: 0.001774535999999216

chordmem: [85, 87, 94] deltamem [209.27564931000015,  
209.28207724700016, 209.27919838200015]  
b chordmem: [85, 87, 94, 92] b deltamem [209.27564931000015,  
209.28207724700016, 209.27919838200015, 209.28593461000017]  
average: 0.0034284333333403083  
compare: ['C#6', 'D#6', 'G#6', 'A#6']  
ostinato did not change  
first: ['C#6', 'D#6', 'G#6', 'A#6'] compare: ['C#6', 'D#6', 'G#6',  
'A#6']  
b chordmem: [85, 87] b deltamem [209.73716427200017,  
209.74408509500017]  
average: 0.006920823000001519  
chordmem: [85, 87] deltamem [209.73716427200017,  
209.74408509500017]  
b chordmem: [85, 87, 94] b deltamem [209.73716427200017,  
209.74408509500017, 209.74119440000018]  
average: 0.0020150640000053954  
chordmem: [85, 87, 94] deltamem [209.73716427200017,  
209.74408509500017, 209.74119440000018]  
b chordmem: [85, 87, 94, 92] b deltamem [209.73716427200017,  
209.74408509500017, 209.74119440000018, 209.75593464500017]  
average: 0.0062567909999984295  
b chordmem: [85, 87] b deltamem [209.99916616500016,  
210.01207735000014]  
average: 0.012911184999978786  
chordmem: [85, 87] deltamem [209.99916616500016,  
210.01207735000014]  
b chordmem: [85, 87, 94] b deltamem [209.99916616500016,  
210.01207735000014, 210.00203823000015]  
average: 0.0014360324999955765  
chordmem: [85, 87, 94] deltamem [209.99916616500016,  
210.01207735000014, 210.00203823000015]  
b chordmem: [85, 87, 94, 92] b deltamem [209.99916616500016,  
210.01207735000014, 210.00203823000015, 210.01605427200013]  
average: 0.005629368999990447  
b chordmem: [85, 87] b deltamem [210.5091313120001,  
210.5195426250001]  
average: 0.010411312999991651  
chordmem: [85, 87] deltamem [210.5091313120001, 210.5195426250001]  
b chordmem: [85, 87, 94] b deltamem [210.5091313120001,  
210.5195426250001, 210.5120249970001]  
average: 0.0014468425000018215  
chordmem: [85, 87, 94] deltamem [210.5091313120001,  
210.5195426250001, 210.5120249970001]  
b chordmem: [85, 87, 94, 92] b deltamem [210.5091313120001,  
210.5195426250001, 210.5120249970001, 210.5230779350001]  
average: 0.004648874333327058  
b chordmem: [85, 87] b deltamem [210.98804062000008,  
210.99804269000006]  
average: 0.010002069999984542  
chordmem: [85, 87] deltamem [210.98804062000008,  
210.99804269000006]  
b chordmem: [85, 87, 94] b deltamem [210.98804062000008,  
210.99804269000006, 210.99499022200007]

average: 0.003474800999995864  
chordmem: [85, 87, 94] deltamem [210.98804062000008,  
210.99804269000006, 210.99499022200007]  
b chordmem: [85, 87, 94, 92] b deltamem [210.98804062000008,  
210.99804269000006, 210.99499022200007, 211.00595709500007]  
average: 0.005972158333330905  
b chordmem: [85, 87] b deltamem [211.51692832200007,  
211.52887708700007]  
average: 0.01194876499999964  
chordmem: [85, 87] deltamem [211.51692832200007,  
211.52887708700007]  
b chordmem: [85, 87, 94] b deltamem [211.51692832200007,  
211.52887708700007, 211.51987467000006]  
average: 0.001473173999997357  
chordmem: [85, 87, 94] deltamem [211.51692832200007,  
211.52887708700007, 211.51987467000006]  
b chordmem: [85, 87, 94, 92] b deltamem [211.51692832200007,  
211.52887708700007, 211.51987467000006, 211.53400538500006]  
average: 0.005692354333329301  
b chordmem: [85, 87] b deltamem [212.01587738100008,  
212.02786198200008]  
average: 0.0119846009999994655  
chordmem: [85, 87] deltamem [212.01587738100008,  
212.02786198200008]  
b chordmem: [85, 87, 94] b deltamem [212.01587738100008,  
212.02786198200008, 212.02520469700008]  
average: 0.00466365799999835  
chordmem: [85, 87, 94] deltamem [212.01587738100008,  
212.02786198200008, 212.02520469700008]  
b chordmem: [85, 87, 94, 92] b deltamem [212.01587738100008,  
212.02786198200008, 212.02520469700008, 212.03326915500008]  
average: 0.005797258000001193  
found ostinato! ['C#6', 'D#6', 'G#6', 'A#6']  
b chordmem: [85, 87] b deltamem [212.4980636020001,  
212.5009200100001]  
average: 0.0028564080000137437  
chordmem: [85, 87] deltamem [212.4980636020001, 212.5009200100001]  
b chordmem: [85, 87, 94] b deltamem [212.4980636020001,  
212.5009200100001, 212.49504548500008]  
average: -0.001509058500005267  
chordmem: [85, 87, 94] deltamem [212.4980636020001,  
212.5009200100001, 212.49504548500008]  
b chordmem: [85, 87, 94, 92] b deltamem [212.4980636020001,  
212.5009200100001, 212.49504548500008, 212.5050218700001]  
average: 0.0023194226666684394  
b chordmem: [85, 87] b deltamem [212.76601328200007,  
212.7739381920001]  
average: 0.007924910000014052  
chordmem: [85, 87] deltamem [212.76601328200007, 212.7739381920001]  
b chordmem: [85, 87, 94] b deltamem [212.76601328200007,  
212.7739381920001, 212.76993068200008]  
average: 0.0019587000000029775  
chordmem: [85, 87, 94] deltamem [212.76601328200007,  
212.7739381920001, 212.76993068200008]



b chordmem: [85, 87, 94, 92] b deltamem [212.76601328200007, 212.7739381920001, 212.76993068200008, 212.7819756670001]  
average: 0.005320795000007668  
b chordmem: [85, 87] b deltamem [213.2499028470001, 213.2632232020001]  
average: 0.013320354999990514  
chordmem: [85, 87] deltamem [213.2499028470001, 213.2632232020001]  
b chordmem: [85, 87, 92] b deltamem [213.2499028470001, 213.2632232020001, 213.2689218220001]  
average: 0.009509487499997249  
chordmem: [85, 87, 92] deltamem [213.2499028470001, 213.2632232020001, 213.2689218220001]  
b chordmem: [85, 87, 92, 94] b deltamem [213.2499028470001, 213.2632232020001, 213.2689218220001, 213.2540237400001]  
average: 0.0013736309999975067  
b chordmem: [85, 87] b deltamem [213.7368885480001, 213.7409323400001]  
average: 0.004043792000004487  
chordmem: [85, 87] deltamem [213.7368885480001, 213.7409323400001]  
b chordmem: [85, 87, 21] b deltamem [213.7368885480001, 213.7409323400001, 213.74789999800012]  
average: 0.005505725000006123  
chordmem: [85, 87, 21] deltamem [213.7368885480001, 213.7409323400001, 213.74789999800012]  
[7, '.']  
b chordmem: [85, 87, 21, 92] b deltamem [213.7368885480001, 213.7409323400001, 213.74789999800012, 213.7448941900001]  
average: 0.0026685473333335117  
b chordmem: [92, 94] b deltamem [213.7448941900001, 213.7339100250001]  
average: -0.010984164999996437  
chordmem: [92, 94] deltamem [213.7448941900001, 213.7339100250001]  
b chordmem: [92, 94, 87] b deltamem [213.7448941900001, 213.7339100250001, 214.2070519050001, 214.2191448570001]  
average: 0.15808355566665946  
chordmem: [94, 87] deltamem [213.7339100250001, 214.2070519050001, 214.2191448570001]  
b chordmem: [94, 87, 92, 85] b deltamem [213.7339100250001, 214.2070519050001, 214.2191448570001, 214.1960540900001]  
average: 0.15404802166666323  
chordmem: [87, 92, 85] deltamem [214.2070519050001, 214.2191448570001, 214.1960540900001]  
b chordmem: [87, 92, 85, 94] b deltamem [214.2070519050001, 214.2191448570001, 214.1960540900001, 214.2040978420001]  
average: -0.0009846876666680753  
b chordmem: [85, 87] b deltamem [214.71129762700008, 214.71803542200007]  
average: 0.006737794999992275  
chordmem: [85, 87] deltamem [214.71129762700008, 214.71803542200007]  
b chordmem: [85, 87, 92] b deltamem [214.71129762700008, 214.71803542200007, 214.72188618500007]  
average: 0.005294278999997459  
chordmem: [85, 87, 92] deltamem [214.71129762700008,

214.71803542200007, 214.72188618500007]  
b chordmem: [85, 87, 92, 94] b deltamem [214.71129762700008,  
214.71803542200007, 214.72188618500007, 214.71510041200008]  
average: 0.00126759500000162  
b chordmem: [87, 85] b deltamem [215.24487972600005,  
215.24101305000005]  
average: -0.0038666760000012346  
chordmem: [87, 85] deltamem [215.24487972600005,  
215.24101305000005]  
b chordmem: [87, 85, 94] b deltamem [215.24487972600005,  
215.24101305000005, 215.23803924500004]  
average: -0.003420240500005889  
chordmem: [87, 85, 94] deltamem [215.24487972600005,  
215.24101305000005, 215.23803924500004]  
b chordmem: [87, 85, 94, 92] b deltamem [215.24487972600005,  
215.24101305000005, 215.23803924500004, 215.24991558800005]  
average: 0.0016786206666665748  
evaluate!  
[7, '.']  
parsed rule: 7.  
parsed dynamics:  
ckar rule : 7.  
current tree: 2  
7  
b chordmem: [87, 85] b deltamem [215.76700320000003,  
215.75693659700002]  
average: -0.01006660300001272  
chordmem: [87, 85] deltamem [215.76700320000003,  
215.75693659700002]  
b chordmem: [87, 85, 94] b deltamem [215.76700320000003,  
215.75693659700002, 215.76001262800003]  
average: -0.0034952860000032615  
chordmem: [87, 85, 94] deltamem [215.76700320000003,  
215.75693659700002, 215.76001262800003]  
b chordmem: [87, 85, 94, 92] b deltamem [215.76700320000003,  
215.75693659700002, 215.76001262800003, 215.77110429100003]  
average: 0.0013670303333318163  
identity  
[0]  
b chordmem: [85, 87] b deltamem [216.507931668, 216.512088972]  
average: 0.004157303999988926  
chordmem: [85, 87] deltamem [216.507931668, 216.512088972]  
b chordmem: [85, 87, 94] b deltamem [216.507931668, 216.512088972,  
216.50594951]  
average: -0.0009910790000020597  
chordmem: [85, 87, 94] deltamem [216.507931668, 216.512088972,  
216.50594951]  
b chordmem: [85, 87, 94, 92] b deltamem [216.507931668,  
216.512088972, 216.50594951, 216.51609240699997]  
average: 0.002720246333325349  
b chordmem: [85, 87] b deltamem [216.99799504199999,  
217.00595812999998]  
average: 0.007963087999996787  
chordmem: [85, 87] deltamem [216.99799504199999,

217.00595812999998]  
b chordmem: [85, 87, 92] b deltamem [216.99799504199999,  
217.00595812999998, 217.016035897]  
average: 0.009020427500004757  
chordmem: [85, 87, 92] deltamem [216.99799504199999,  
217.00595812999998, 217.016035897]  
b chordmem: [85, 87, 92, 94] b deltamem [216.99799504199999,  
217.00595812999998, 217.016035897, 216.994925282]  
average: -0.0010232533333294214  
b chordmem: [85, 94] b deltamem [217.26394691199997,  
217.26590273799997]  
average: 0.0019558259999996608  
chordmem: [85, 94] deltamem [217.26394691199997,  
217.26590273799997]  
b chordmem: [85, 94, 92] b deltamem [217.26394691199997,  
217.26590273799997, 217.27289421199995]  
average: 0.0044736499999942225  
chordmem: [85, 94, 92] deltamem [217.26394691199997,  
217.26590273799997, 217.27289421199995]  
b chordmem: [85, 94, 92, 87] b deltamem [217.26590273799997,  
217.27289421199995, 217.73660183699997, 217.74013414199996]  
average: 0.15807713466666465  
chordmem: [94, 92, 87] deltamem [217.27289421199995,  
217.73660183699997, 217.74013414199996]  
b chordmem: [94, 92, 87] b deltamem [217.27289421199995,  
217.73660183699997, 217.74013414199996, 217.73307586199996]  
average: 0.1533938833333366  
chordmem: [92, 87] deltamem [217.73660183699997,  
217.74013414199996, 217.73307586199996]  
b chordmem: [92, 87, 85] b deltamem [217.74013414199996,  
217.73307586199996, 218.76295434199997, 218.77408134499996]  
average: 0.3446490676666656  
chordmem: [87, 85] deltamem [217.73307586199996,  
218.76295434199997, 218.77408134499996]  
b chordmem: [87, 85, 94] b deltamem [217.73307586199996,  
218.76295434199997, 218.77408134499996, 218.76619577599996]  
average: 0.34437330466666555  
chordmem: [85, 94] deltamem [218.76295434199997,  
218.77408134499996, 218.76619577599996]  
b chordmem: [85, 94, 92] b deltamem [218.76295434199997,  
218.77408134499996, 218.76619577599996, 218.77803311099996]  
average: 0.005026256333328168  
chordmem: [85, 94, 92] deltamem [218.76295434199997,  
218.77408134499996, 218.76619577599996, 218.77803311099996]  
b chordmem: [85, 94, 92, 87] b deltamem [218.77408134499996,  
218.76619577599996, 218.77803311099996, 219.49703965499992,  
219.48608800999992]  
average: 0.17800166624999036  
chordmem: [94, 92, 87] deltamem [218.76619577599996,  
218.77803311099996, 219.49703965499992, 219.48608800999992]  
b chordmem: [94, 92, 87, 85] b deltamem [218.77803311099996,  
219.49703965499992, 219.48608800999992, 219.48904120999993]  
average: 0.23700269966665624  
chordmem: [92, 87, 85] deltamem [219.49703965499992,

219.48608800999992, 219.48904120999993]  
b chordmem: [92, 87, 85, 94] b deltamem [219.49703965499992,  
219.48608800999992, 219.48904120999993, 219.5010192219999]  
average: 0.0013265223333291942  
compare: ['C#6', 'D#6', 'G#6', 'A#6']  
ostinato did not change  
first: ['C#6', 'D#6', 'G#6', 'A#6'] compare: ['C#6', 'D#6', 'G#6',  
'A#6']  
b chordmem: [85, 87] b deltamem [219.99109564999992,  
219.99886301499993]  
average: 0.007767365000006521  
chordmem: [85, 87] deltamem [219.99109564999992,  
219.99886301499993]  
b chordmem: [85, 87, 94] b deltamem [219.99109564999992,  
219.99886301499993, 219.99388579799992]  
average: 0.001395074000001273  
chordmem: [85, 87, 94] deltamem [219.99109564999992,  
219.99886301499993, 219.99388579799992]  
b chordmem: [85, 87, 94, 92] b deltamem [219.99109564999992,  
219.99886301499993, 219.99388579799992, 220.00607026999992]  
average: 0.004991540000001275  
b chordmem: [87, 85] b deltamem [221.7360693599999,  
221.7239036129999]  
average: -0.012165747000011606  
chordmem: [87, 85] deltamem [221.7360693599999, 221.7239036129999]  
b chordmem: [87, 85, 94] b deltamem [221.7360693599999,  
221.7239036129999, 221.7268795579999]  
average: -0.00459490100000437  
chordmem: [87, 85, 94] deltamem [221.7360693599999,  
221.7239036129999, 221.7268795579999]  
b chordmem: [87, 85, 94, 92] b deltamem [221.7360693599999,  
221.7239036129999, 221.7268795579999, 221.7310501719999]  
average: -0.0016730626666685566  
b chordmem: [85, 94] b deltamem [223.7270568649999,  
223.72403060199989]  
average: -0.0030262630000095214  
chordmem: [85, 94] deltamem [223.7270568649999, 223.72403060199989]  
b chordmem: [85, 94, 87] b deltamem [223.7270568649999,  
223.72403060199989, 223.73505786199988]  
average: 0.0040004984999910675  
chordmem: [85, 94, 87] deltamem [223.7270568649999,  
223.72403060199989, 223.73505786199988]  
b chordmem: [85, 94, 87, 92] b deltamem [223.7270568649999,  
223.72403060199989, 223.73505786199988, 223.73104840499988]  
average: 0.0013305133333290087  
addition  
b chordmem: [87, 85] b deltamem [225.20390014999987,  
225.19701711999988]  
average: -0.006883029999983137  
chordmem: [87, 85] deltamem [225.20390014999987,  
225.19701711999988]  
b chordmem: [87, 85, 94] b deltamem [225.20390014999987,  
225.19701711999988, 225.20007545199988]  
average: -0.0019123489999941512

chordmem: [87, 85, 94] deltamem [225.20390014999987,  
225.19701711999988, 225.20007545199988]  
b chordmem: [87, 85, 94, 92] b deltamem [225.20390014999987,  
225.19701711999988, 225.20007545199988, 225.20801995499986]  
average: 0.0013732683333292546  
b chordmem: [85, 87] b deltamem [226.48693372699987,  
226.49098224699986]  
average: 0.0040485199999977795  
chordmem: [85, 87] deltamem [226.48693372699987,  
226.49098224699986]  
b chordmem: [85, 87, 94] b deltamem [226.48693372699987,  
226.49098224699986, 226.48406562199986]  
average: -0.0014340525000022808  
chordmem: [85, 87, 94] deltamem [226.48693372699987,  
226.49098224699986, 226.48406562199986]  
b chordmem: [85, 87, 94, 92] b deltamem [226.48693372699987,  
226.49098224699986, 226.48406562199986, 226.49502940199986]  
average: 0.0026985583333309173  
dynamics: [94]  
successor  
b chordmem: [85, 87] b deltamem [227.22804081199985,  
227.23916992199983]  
average: 0.0111291099999984621  
chordmem: [85, 87] deltamem [227.22804081199985,  
227.23916992199983]  
b chordmem: [85, 87, 94] b deltamem [227.22804081199985,  
227.23916992199983, 227.23209305499984]  
average: 0.002026121499994815  
chordmem: [85, 87, 94] deltamem [227.22804081199985,  
227.23916992199983, 227.23209305499984]  
b chordmem: [85, 87, 94, 92] b deltamem [227.22804081199985,  
227.23916992199983, 227.23209305499984, 227.23500780199984]  
average: 0.0023223299999983738  
dynamics: [94, 80]  
successor  
b chordmem: [85, 87] b deltamem [227.9960826549998,  
228.0034522419998]  
average: 0.007369586999999456  
chordmem: [85, 87] deltamem [227.9960826549998, 228.0034522419998]  
b chordmem: [85, 87, 94] b deltamem [227.9960826549998,  
228.0034522419998, 227.99919049499982]  
average: 0.0015539200000063147  
chordmem: [85, 87, 94] deltamem [227.9960826549998,  
228.0034522419998, 227.99919049499982]  
b chordmem: [85, 87, 94, 92] b deltamem [227.9960826549998,  
228.0034522419998, 227.99919049499982, 228.00715471999982]  
average: 0.0036906883333358564  
dynamics: [94, 80, 87]  
successor  
b chordmem: [85, 87] b deltamem [228.76903729499983,  
228.77603781199983]  
average: 0.007000516999994488  
chordmem: [85, 87] deltamem [228.76903729499983,  
228.77603781199983]

b chordmem: [85, 87, 94] b deltamem [228.76903729499983,  
228.77603781199983, 228.77208331999984]  
average: 0.0015230125000016415  
chordmem: [85, 87, 94] deltamem [228.76903729499983,  
228.77603781199983, 228.77208331999984]  
b chordmem: [85, 87, 94, 92] b deltamem [228.76903729499983,  
228.77603781199983, 228.77208331999984, 228.78103830799984]  
average: 0.0040003376666675194  
dynamics: [94, 80, 87, 89]  
successor  
b chordmem: [85, 87] b deltamem [229.50995627999984,  
229.51409408499984]  
average: 0.004137804999999162  
chordmem: [85, 87] deltamem [229.50995627999984,  
229.51409408499984]  
b chordmem: [85, 87, 94] b deltamem [229.50995627999984,  
229.51409408499984, 229.50706415199983]  
average: -0.001446064000006686  
chordmem: [85, 87, 94] deltamem [229.50995627999984,  
229.51409408499984, 229.50706415199983]  
b chordmem: [85, 87, 94, 92] b deltamem [229.50995627999984,  
229.51409408499984, 229.50706415199983, 229.51801129199984]  
average: 0.0026850039999999353  
dynamics: [94, 80, 87, 89, 93]  
successor  
b chordmem: [85, 87] b deltamem [230.26803916699978,  
230.27524950699978]  
average: 0.007210340000000315  
chordmem: [85, 87] deltamem [230.26803916699978,  
230.27524950699978]  
b chordmem: [85, 87, 94] b deltamem [230.26803916699978,  
230.27524950699978, 230.27109431999978]  
average: 0.0015275764999955754  
chordmem: [85, 87, 94] deltamem [230.26803916699978,  
230.27524950699978, 230.27109431999978]  
b chordmem: [85, 87, 94, 92] b deltamem [230.26803916699978,  
230.27524950699978, 230.27109431999978, 230.2790569519998]  
average: 0.003672595000002351  
dynamics: [94, 80, 87, 89, 93, 91]  
successor  
b chordmem: [85, 87] b deltamem [231.0150767749998,  
231.02703571199982]  
average: 0.011958937000002834  
chordmem: [85, 87] deltamem [231.0150767749998, 231.02703571199982]  
b chordmem: [85, 87, 94] b deltamem [231.0150767749998,  
231.02703571199982, 231.01804314699982]  
average: 0.001483186000001524  
chordmem: [85, 87, 94] deltamem [231.0150767749998,  
231.02703571199982, 231.01804314699982]  
b chordmem: [85, 87, 94, 92] b deltamem [231.0150767749998,  
231.02703571199982, 231.01804314699982, 231.0230073149998]  
average: 0.0026435133333298686  
identity  
succ head: 6

rules now osc: [0, 6]  
dynamics now: []  
b chordmem: [87, 85] b deltamem [232.01497574199982,  
232.0051003999998]  
average: -0.009875342000015053  
chordmem: [87, 85] deltamem [232.01497574199982, 232.0051003999998]  
b chordmem: [87, 85, 94] b deltamem [232.01497574199982,  
232.0051003999998, 232.0079657799998]  
average: -0.003504981000006069  
chordmem: [87, 85, 94] deltamem [232.01497574199982,  
232.0051003999998, 232.0079657799998]  
b chordmem: [87, 85, 94, 92] b deltamem [232.01497574199982,  
232.0051003999998, 232.0079657799998, 232.02303577699982]  
average: 0.002686678333333248  
b chordmem: [85, 87] b deltamem [232.49905474499977,  
232.50595035699976]  
average: 0.006895611999993889  
chordmem: [85, 87] deltamem [232.49905474499977,  
232.50595035699976]  
b chordmem: [85, 87, 94] b deltamem [232.49905474499977,  
232.50595035699976, 232.50203864999978]  
average: 0.0014919525000038902  
chordmem: [85, 87, 94] deltamem [232.49905474499977,  
232.50595035699976, 232.50203864999978]  
b chordmem: [85, 87, 94, 92] b deltamem [232.49905474499977,  
232.50595035699976, 232.50203864999978, 232.51204251499976]  
average: 0.00432925666666506  
found ostinato! ['C#6', 'D#6', 'G#6', 'A#6']  
b chordmem: [85, 87] b deltamem [233.01201921199973,  
233.02207754199972]  
average: 0.010058329999992566  
chordmem: [85, 87] deltamem [233.01201921199973,  
233.02207754199972]  
b chordmem: [85, 87, 94] b deltamem [233.01201921199973,  
233.02207754199972, 233.01793595999973]  
average: 0.0029583740000020953  
chordmem: [85, 87, 94] deltamem [233.01201921199973,  
233.02207754199972, 233.01793595999973]  
b chordmem: [85, 87, 94, 92] b deltamem [233.01201921199973,  
233.02207754199972, 233.01793595999973, 233.0260917349997]  
average: 0.0046908409999993877  
[0, 6, '.']  
b chordmem: [85, 87] b deltamem [234.3019228869997,  
234.3128860979997]  
average: 0.010963210999989315  
chordmem: [85, 87] deltamem [234.3019228869997, 234.3128860979997]  
b chordmem: [85, 87, 94] b deltamem [234.3019228869997,  
234.3128860979997, 234.3048850249997]  
average: 0.0014810689999933402  
chordmem: [85, 87, 94] deltamem [234.3019228869997,  
234.3128860979997, 234.3048850249997]  
b chordmem: [85, 87, 94, 92] b deltamem [234.3019228869997,  
234.3128860979997, 234.3048850249997, 234.3178802329997]  
average: 0.005319115333331108

b chordmem: [85, 87] b deltamem [234.81186991199968,  
234.82231061999968]  
average: 0.010440708000004406  
chordmem: [85, 87] deltamem [234.81186991199968,  
234.82231061999968]  
b chordmem: [85, 87, 94] b deltamem [234.81186991199968,  
234.82231061999968, 234.8148524569997]  
average: 0.0014912725000044702  
chordmem: [85, 87, 94] deltamem [234.81186991199968,  
234.82231061999968, 234.8148524569997]  
b chordmem: [85, 87, 94, 92] b deltamem [234.81186991199968,  
234.82231061999968, 234.8148524569997, 234.8229915349997]  
average: 0.003707207666669395  
b chordmem: [85, 87] b deltamem [235.2790871949997,  
235.2949970899997]  
average: 0.015909894999992957  
chordmem: [85, 87] deltamem [235.2790871949997, 235.2949970899997]  
b chordmem: [85, 87, 92] b deltamem [235.2790871949997,  
235.2949970899997, 235.2900620849997]  
average: 0.00548744499999998  
chordmem: [85, 87, 92] deltamem [235.2790871949997,  
235.2949970899997, 235.2900620849997]  
b chordmem: [85, 87, 92, 94] b deltamem [235.2790871949997,  
235.2949970899997, 235.2900620849997, 235.2860084369997]  
average: 0.002307080666668071  
b chordmem: [85, 87] b deltamem [235.77776246699972,  
235.78303874999972]  
average: 0.005276283000000603  
chordmem: [85, 87] deltamem [235.77776246699972,  
235.78303874999972]  
b chordmem: [85, 87, 94] b deltamem [235.77776246699972,  
235.78303874999972, 235.7721729669997]  
average: -0.0027947500000067294  
chordmem: [85, 87, 94] deltamem [235.77776246699972,  
235.78303874999972, 235.7721729669997]  
b chordmem: [85, 87, 94, 92] b deltamem [235.77776246699972,  
235.78303874999972, 235.7721729669997, 235.77906774699971]  
average: 0.0004350933333322852  
b chordmem: [85, 87] b deltamem [236.25419448699972,  
236.2661825769997]  
average: 0.01198808999998846  
chordmem: [85, 87] deltamem [236.25419448699972, 236.2661825769997]  
b chordmem: [85, 87, 94] b deltamem [236.25419448699972,  
236.2661825769997, 236.25818116199972]  
average: 0.001993337499996528  
chordmem: [85, 87, 94] deltamem [236.25419448699972,  
236.2661825769997, 236.25818116199972]  
b chordmem: [85, 87, 94, 92] b deltamem [236.25419448699972,  
236.2661825769997, 236.25818116199972, 236.26484076199972]  
average: 0.00354875833333305  
b chordmem: [85, 87] b deltamem [236.72496707999974,  
236.73009708499976]  
average: 0.005130005000012261  
chordmem: [85, 87] deltamem [236.72496707999974,



236.73009708499976]  
b chordmem: [85, 87, 94] b deltamem [236.72496707999974,  
236.73009708499976, 236.73413220499975]  
average: 0.004582562500004883  
chordmem: [85, 87, 94] deltamem [236.72496707999974,  
236.73009708499976, 236.73413220499975]  
b chordmem: [85, 87, 94, 92] b deltamem [236.72496707999974,  
236.73009708499976, 236.73413220499975, 236.73690910399975]  
average: 0.003980674666668922  
b chordmem: [87, 85] b deltamem [236.99497224199976,  
236.97838243299975]  
average: -0.016589809000009836  
chordmem: [87, 85] deltamem [236.99497224199976,  
236.97838243299975]  
b chordmem: [87, 85, 92] b deltamem [236.99497224199976,  
236.97838243299975, 236.99058672599975]  
average: -0.0021927580000067337  
chordmem: [87, 85, 92] deltamem [236.99497224199976,  
236.97838243299975, 236.99058672599975]  
b chordmem: [87, 85, 92, 94] b deltamem [236.99497224199976,  
236.97838243299975, 236.99058672599975, 236.98304648099975]  
average: -0.003975253666671581  
b chordmem: [87, 85] b deltamem [237.21706568999977,  
237.20251252799977]  
average: -0.014553161999998565  
chordmem: [87, 85] deltamem [237.21706568999977,  
237.20251252799977]  
b chordmem: [87, 85, 76] b deltamem [237.21706568999977,  
237.20251252799977, 237.19892014699977]  
average: -0.009072771500001409  
chordmem: [87, 85, 76] deltamem [237.21706568999977,  
237.20251252799977, 237.19892014699977]  
dynamics: [99]  
successor  
b chordmem: [87, 85, 76, 94] b deltamem [237.21706568999977,  
237.20251252799977, 237.19892014699977, 237.20492590299978]  
average: -0.004046595666665098  
b chordmem: [94, 92] b deltamem [237.20492590299978,  
237.22092233499978]  
average: 0.015996432000008554  
chordmem: [94, 92] deltamem [237.20492590299978,  
237.22092233499978]  
b chordmem: [94, 92, 87, 85] b deltamem [237.20492590299978,  
237.22092233499978, 237.45907997999973, 237.43705482699974]  
average: 0.07737630799998858  
chordmem: [92, 87, 85] deltamem [237.22092233499978,  
237.45907997999973, 237.43705482699974]  
b chordmem: [92, 87, 85, 76] b deltamem [237.22092233499978,  
237.45907997999973, 237.43705482699974, 237.43209580999974]  
average: 0.07039115833331759  
chordmem: [87, 85, 76] deltamem [237.45907997999973,  
237.43705482699974, 237.43209580999974]  
dynamics: [99, 95]  
successor

b chordmem: [87, 85, 76, 94] b deltamem [237.45907997999973, 237.43705482699974, 237.43209580999974, 237.43995354999973]  
average: -0.006375476666666676  
b chordmem: [94, 92] b deltamem [237.43995354999973, 237.45193238199974]  
average: 0.011978832000011153  
chordmem: [94, 92] deltamem [237.43995354999973, 237.45193238199974]  
b chordmem: [94, 92, 85, 87] b deltamem [237.43995354999973, 237.45193238199974, 237.6880371649997, 237.70792128699972]  
average: 0.0893225789999974  
chordmem: [92, 85, 87] deltamem [237.45193238199974, 237.6880371649997, 237.70792128699972]  
identity  
succ head: 2  
rules now osc: [0, 6, '.', 2]  
dynamics now: [97]  
b chordmem: [85, 87, 74, 94] b deltamem [237.6880371649997, 237.70792128699972, 237.6659031199997, 237.68604616699972]  
average: -0.00066366599999886  
b chordmem: [94, 92] b deltamem [237.68604616699972, 237.6919427779997]  
average: 0.005896610999997165  
chordmem: [94, 92] deltamem [237.68604616699972, 237.6919427779997]  
evaluate!  
[0, 6, '.', 2]  
parsed rule: 06.2  
parsed dynamics: 97  
ckar rule : 06.2  
current tree: 2  
9  
EASTER EGG FOUND: Average number of times we pkill scsynth in a CK session  
b chordmem: [94, 92, 85, 87] b deltamem [237.68604616699972, 237.6919427779997, 238.9929633469998, 239.00186299299978]  
average: 0.43860560866668646  
chordmem: [92, 85, 87] deltamem [237.6919427779997, 238.9929633469998, 239.00186299299978]  
b chordmem: [92, 85, 87] b deltamem [237.6919427779997, 238.9929633469998, 239.00186299299978, 239.0058862059998]  
average: 0.4379811426666909  
chordmem: [85, 87] deltamem [238.9929633469998, 239.00186299299978, 239.0058862059998]  
b chordmem: [85, 87, 92, 94] b deltamem [238.9929633469998, 239.00186299299978, 239.0058862059998, 238.9989278269998]  
average: 0.001988159999996242  
dynamics: [93]  
successor  
b chordmem: [87, 92] b deltamem [239.98296478499984, 239.99007785599983]  
average: 0.007113070999992033  
chordmem: [87, 92] deltamem [239.98296478499984, 239.99007785599983]  
b chordmem: [87, 92, 94] b deltamem [239.98296478499984,

239.99007785599983, 239.98689391499983]  
average: 0.0019645649999944226  
chordmem: [87, 92, 94] deltamem [239.98296478499984,  
239.99007785599983, 239.98689391499983]  
b chordmem: [87, 92, 94] b deltamem [239.99007785599983,  
239.98689391499983, 240.54505266999982, 240.53210631199983]  
average: 0.180676151999999  
chordmem: [92, 94] deltamem [239.98689391499983,  
240.54505266999982, 240.53210631199983]  
b chordmem: [92, 94] b deltamem [239.98689391499983,  
240.54505266999982, 240.53210631199983, 240.53608726499982]  
average: 0.18306444999999863  
chordmem: [94] deltamem [240.54505266999982, 240.53210631199983,  
240.53608726499982]  
dynamics: [93, 105]  
successor  
dynamics: [93, 105, 107]  
successor  
b chordmem: [94, 76, 85] b deltamem [240.53210631199983,  
240.53608726499982, 247.45401678199983, 247.46702547999982]  
average: 2.3116397226666643  
chordmem: [76, 85] deltamem [240.53608726499982,  
247.45401678199983, 247.46702547999982]  
dynamics: [93, 105, 107, 110]  
successor  
b chordmem: [76, 85] b deltamem [247.45401678199983,  
247.46702547999982, 248.1929217599998, 248.2101170519998]  
average: 0.2520334233333206  
chordmem: [85] deltamem [247.46702547999982, 248.1929217599998,  
248.2101170519998]  
dynamics: [93, 105, 107, 110, 114]  
successor  
b chordmem: [85, 76] b deltamem [248.1929217599998,  
248.2101170519998, 248.96810251699983, 248.95502825499983]  
average: 0.25403549833334677  
chordmem: [76] deltamem [248.2101170519998, 248.96810251699983,  
248.95502825499983]  
dynamics: [93, 105, 107, 110, 114, 110]  
successor  
b chordmem: [76, 85] b deltamem [248.96810251699983,  
248.95502825499983, 249.68007719999983, 249.69802851499983]  
average: 0.2433086659999996  
chordmem: [85] deltamem [248.95502825499983, 249.68007719999983,  
249.69802851499983]  
dynamics: [93, 105, 107, 110, 114, 110, 105]  
successor  
b chordmem: [85, 76] b deltamem [249.68007719999983,  
249.69802851499983, 250.43502509199985, 250.44010057999984]  
average: 0.25334112666666897  
chordmem: [76] deltamem [249.69802851499983, 250.43502509199985,  
250.44010057999984]  
identity  
succ head: 7  
rules now osc: [7]

```
dynamics now: []
b chordmem: [76, 74, 85] b deltamem [250.43502509199985,
250.44010057999984, 251.11598769199986, 251.13891841499986]
average: 0.23463110766667228
chordmem: [74, 85] deltamem [250.44010057999984,
251.11598769199986, 251.13891841499986]
[7, '.']
b chordmem: [74, 85, 87, 76] b deltamem [251.11598769199986,
251.13891841499986, 258.4980610469997, 258.4860280149997]
average: 2.456680107666614
chordmem: [85, 87, 76] deltamem [251.13891841499986,
258.4980610469997, 258.4860280149997]
dynamics: [78]
successor
dynamics: [78, 71]
successor
b chordmem: [87, 76, 77, 92] b deltamem [258.4980610469997,
258.4860280149997, 258.7180188699997, 258.7271285119997]
average: 0.07635582166667139
chordmem: [76, 77, 92] deltamem [258.4860280149997,
258.7180188699997, 258.7271285119997]
dynamics: [78, 71, 71]
successor
b chordmem: [76, 77, 92, 87] b deltamem [258.7180188699997,
258.7271285119997, 258.9769381869997, 258.9729086799997]
average: 0.08496327000000292
chordmem: [77, 92, 87] deltamem [258.7271285119997,
258.9769381869997, 258.9729086799997]
b chordmem: [92, 87, 85, 74] b deltamem [258.9769381869997,
258.9729086799997, 259.21805034699975, 259.22189454199975]
average: 0.08165211833335206
chordmem: [87, 85, 74] deltamem [258.9729086799997,
259.21805034699975, 259.22189454199975]
identity
succ head: 3
rules now osc: [7, '.', 3]
dynamics now: [73]
b chordmem: [87, 85, 74, 75] b deltamem [259.21805034699975,
259.22189454199975, 259.46306714999974, 259.45004624699976]
average: 0.07733196666667179
chordmem: [85, 74, 75] deltamem [259.22189454199975,
259.46306714999974, 259.45004624699976]
evaluate!
[7, '.', 3]
parsed rule: 7.3
parsed dynamics: 73
ckar rule : 7.3
current tree: 2
b chordmem: [74, 75, 94, 76] b deltamem [259.46306714999974,
259.45004624699976, 266.97897892699956, 266.96690116699955]
average: 2.501278005666601
chordmem: [75, 94, 76] deltamem [259.45004624699976,
266.97897892699956, 266.96690116699955]
dynamics: [88]
```

successor  
b chordmem: [75, 94, 76, 87] b deltamem [266.97897892699956, 266.96690116699955, 267.48310314199955, 267.4690752519995]  
average: 0.1633654416666559  
chordmem: [94, 76, 87] deltamem [266.96690116699955, 267.48310314199955, 267.4690752519995]  
dynamics: [88, 89]  
successor  
dynamics: [88, 89, 93]  
successor  
b chordmem: [94, 76, 87, 92] b deltamem [267.48310314199955, 267.4690752519995, 267.95806785499957, 267.9790895049996]  
average: 0.1653287876666809  
chordmem: [76, 87, 92] deltamem [267.4690752519995, 267.95806785499957, 267.9790895049996]  
b chordmem: [76, 87, 92, 85] b deltamem [267.95806785499957, 267.9790895049996, 268.4869793549996, 268.48304926499964]  
average: 0.17499380333335543  
chordmem: [87, 92, 85] deltamem [267.9790895049996, 268.4869793549996, 268.48304926499964]  
dynamics: [88, 89, 93, 98]  
successor  
b chordmem: [87, 92, 85, 74] b deltamem [268.4869793549996, 268.48304926499964, 268.98393485699955, 268.97904436199957]  
average: 0.1640216689999837  
chordmem: [92, 85, 74] deltamem [268.48304926499964, 268.98393485699955, 268.97904436199957]  
identity  
succ head: 4  
rules now osc: [4]  
dynamics now: []  
[4, '.']  
b chordmem: [92, 85, 74, 21] b deltamem [268.98393485699955, 268.97904436199957, 270.9830387949995, 270.9920341319995]  
average: 0.6693664249999832  
chordmem: [85, 74, 21] deltamem [268.97904436199957, 270.9830387949995, 270.9920341319995]  
dynamics: [76]  
successor  
b chordmem: [74, 21, 92, 77] b deltamem [270.9830387949995, 270.9920341319995, 272.26496256999945, 272.26100913199946]  
average: 0.42599011233331413  
chordmem: [21, 92, 77] deltamem [270.9920341319995, 272.26496256999945, 272.26100913199946]  
dynamics: [76, 65]  
successor  
dynamics: [76, 65, 68]  
successor  
b chordmem: [92, 77, 76, 87] b deltamem [272.26496256999945, 272.26100913199946, 272.50196706999947, 272.5121409999995]  
average: 0.08239281000000649  
chordmem: [77, 76, 87] deltamem [272.26100913199946, 272.50196706999947, 272.5121409999995]  
b chordmem: [76, 87, 85, 74] b deltamem [272.50196706999947,

272.5121409999995, 272.75799462499947, 272.74995387499945]  
average: 0.08266226833332742  
chordmem: [87, 85, 74] deltamem [272.5121409999995,  
272.75799462499947, 272.74995387499945]  
identity  
succ head: 3  
rules now osc: [4, '.', 3]  
dynamics now: [70]  
dynamics: [86]  
successor  
b chordmem: [85, 74, 76, 92] b deltamem [272.75799462499947,  
272.74995387499945, 273.45603212999947, 273.4841584549995]  
average: 0.2420546100000062  
chordmem: [74, 76, 92] deltamem [272.74995387499945,  
273.45603212999947, 273.4841584549995]  
dynamics: [86, 87]  
successor  
b chordmem: [74, 76, 92] b deltamem [273.45603212999947,  
273.4841584549995, 273.73295578199946, 273.73588970999947]  
average: 0.09328585999999935  
chordmem: [76, 92] deltamem [273.4841584549995, 273.73295578199946,  
273.73588970999947]  
identity  
succ head: 2  
rules now osc: [4, '.', 3, 2]  
dynamics now: [70, 86]  
b chordmem: [76, 92] b deltamem [273.73295578199946,  
273.73588970999947, 274.9990375949994, 275.0050297449994]  
average: 0.4240246543333039  
chordmem: [92] deltamem [273.73588970999947, 274.9990375949994,  
275.0050297449994]  
dynamics: [95]  
successor  
b chordmem: [92, 76] b deltamem [274.9990375949994,  
275.0050297449994, 275.2501194169993, 275.2531811499993]  
average: 0.08471451833330927  
chordmem: [76] deltamem [275.0050297449994, 275.2501194169993,  
275.2531811499993]  
dynamics: [95, 55]  
successor  
b chordmem: [76, 77] b deltamem [275.0050297449994,  
275.2501194169993, 275.2531811499993, 275.2601034269993]  
average: 0.08502456066664384  
chordmem: [77] deltamem [275.2501194169993, 275.2531811499993,  
275.2601034269993]  
dynamics: [95, 55, 53]  
successor  
dynamics: [95, 55, 53, 77]  
successor  
dynamics: [95, 55, 53, 77, 86]  
successor  
b chordmem: [77, 76, 92] b deltamem [275.2531811499993,  
275.2601034269993, 275.7299334869993, 275.7450672719993]  
average: 0.16396204066666087

chordmem: [76, 92] deltamem [275.2601034269993, 275.7299334869993, 275.7450672719993]  
dynamics: [95, 55, 53, 77, 86, 93]  
successor  
b chordmem: [76, 92] b deltamem [275.7299334869993, 275.7450672719993, 276.01102341499933, 276.01509858699933]  
average: 0.09505503333334293  
chordmem: [92] deltamem [275.7450672719993, 276.01102341499933, 276.01509858699933]  
b chordmem: [92, 76] b deltamem [276.01102341499933, 276.01509858699933, 276.27304659699934, 276.2700378449993]  
average: 0.08633814333332641  
chordmem: [76] deltamem [276.01509858699933, 276.27304659699934, 276.2700378449993]  
dynamics: [95, 55, 53, 77, 86, 93, 94]  
successor  
dynamics: [95, 55, 53, 77, 86, 93, 94, 102]  
successor  
b chordmem: [76, 92] b deltamem [276.27304659699934, 276.2700378449993, 276.53404917999933, 276.53804156999934]  
average: 0.08833165766666677  
chordmem: [92] deltamem [276.2700378449993, 276.53404917999933, 276.53804156999934]  
dynamics: [95, 55, 53, 77, 86, 93, 94, 102, 92]  
successor  
b chordmem: [92, 76] b deltamem [276.53404917999933, 276.53804156999934, 276.76700211999935, 276.77101418999933]  
average: 0.07898833666666686  
chordmem: [76] deltamem [276.53804156999934, 276.76700211999935, 276.77101418999933]  
dynamics: [95, 55, 53, 77, 86, 93, 94, 102, 92, 100]  
successor  
b chordmem: [76, 92] b deltamem [276.76700211999935, 276.77101418999933, 277.02303554699927, 277.02604996199926]  
average: 0.08634928066666386  
chordmem: [92] deltamem [276.77101418999933, 277.02303554699927, 277.02604996199926]  
dynamics: [95, 55, 53, 77, 86, 93, 94, 102, 92, 100, 99]  
successor  
b chordmem: [92, 76] b deltamem [277.02303554699927, 277.02604996199926, 277.2610523469993, 277.2690302369993]  
average: 0.08199823000001061  
chordmem: [76] deltamem [277.02604996199926, 277.2610523469993, 277.2690302369993]  
dynamics: [95, 55, 53, 77, 86, 93, 94, 102, 92, 100, 99, 99]  
successor  
b chordmem: [76, 92] b deltamem [277.2610523469993, 277.2690302369993, 277.5151253749993, 277.5260779099993]  
average: 0.08834185433333157  
chordmem: [92] deltamem [277.2690302369993, 277.5151253749993, 277.5260779099993]  
b chordmem: [92, 85, 74] b deltamem [277.5151253749993, 277.5260779099993, 277.78904089199926, 277.7721190169993]  
average: 0.08566454733333255

chordmem: [85, 74] deltamem [277.5260779099993, 277.78904089199926, 277.7721190169993]  
identity  
succ head: 12  
rules now osc: [4, '.', 3, 2, 12]  
dynamics now: [70, 86, 87]  
b chordmem: [85, 74, 87] b deltamem [277.78904089199926, 277.7721190169993, 278.2870322499993, 278.3140062899993]  
average: 0.17498846600002102  
chordmem: [74, 87] deltamem [277.7721190169993, 278.2870322499993, 278.3140062899993]  
evaluate!  
[4, '.', 3, 2, 12]  
parsed rule: 4.3212  
parsed dynamics: 70|86|87  
ckar rule : 4.3212  
current tree: 2  
b chordmem: [74, 87, 85] b deltamem [278.2870322499993, 278.3140062899993, 279.52492858999926, 279.52289624299925]  
average: 0.41195466433331757  
chordmem: [87, 85] deltamem [278.3140062899993, 279.52492858999926, 279.52289624299925]  
b chordmem: [87, 85, 94] b deltamem [278.3140062899993, 279.52492858999926, 279.52289624299925, 279.5189299719992]  
average: 0.4016412273333003  
chordmem: [85, 94] deltamem [279.52492858999926, 279.52289624299925, 279.5189299719992]  
b chordmem: [85, 94, 92] b deltamem [279.52492858999926, 279.52289624299925, 279.5189299719992, 279.52988708599923]  
average: 0.001652831999990667  
chordmem: [85, 94, 92] deltamem [279.52492858999926, 279.52289624299925, 279.5189299719992, 279.52988708599923]  
dynamics: [91]  
successor  
b chordmem: [85, 94, 92, 87] b deltamem [279.52289624299925, 279.5189299719992, 279.52988708599923, 280.7752268619992, 280.7640366999992]  
average: 0.31028511424999294  
chordmem: [94, 92, 87] deltamem [279.5189299719992, 279.52988708599923, 280.7752268619992, 280.7640366999992]  
b chordmem: [94, 92, 87, 85] b deltamem [279.52988708599923, 280.7752268619992, 280.7640366999992, 280.7671692869992]  
average: 0.41242740033332365  
chordmem: [92, 87, 85] deltamem [280.7752268619992, 280.7640366999992, 280.7671692869992]  
b chordmem: [92, 87, 85, 94] b deltamem [280.7752268619992, 280.7640366999992, 280.7671692869992, 280.77998653999924]  
average: 0.0015865593333425447  
dynamics: [91, 76]  
successor  
dynamics: [91, 76, 68]  
successor  
b chordmem: [87, 85] b deltamem [282.00796103699923, 281.9970509469992]



average: -0.010910090000038508  
chordmem: [87, 85] deltamem [282.00796103699923, 281.9970509469992]  
b chordmem: [87, 85, 92] b deltamem [282.00796103699923, 281.9970509469992, 282.0130470119992]  
average: 0.0025429874999929325  
chordmem: [87, 85, 92] deltamem [282.00796103699923, 281.9970509469992, 282.0130470119992]  
b chordmem: [87, 85, 92, 94] b deltamem [282.00796103699923, 281.9970509469992, 282.0130470119992, 281.9999072899992]  
average: -0.002684582333339828  
dynamics: [91, 76, 68, 36]  
successor  
dynamics: [91, 76, 68, 36, 90]  
successor  
dynamics: [91, 76, 68, 36, 90, 89]  
successor  
greater than  
b chordmem: [73, 75] b deltamem [283.9940892649991, 283.9979390199991]  
average: 0.003849754999976085  
chordmem: [73, 75] deltamem [283.9940892649991, 283.9979390199991]  
evaluate!  
[]  
b chordmem: [73, 75, 82] b deltamem [283.9940892649991, 283.9979390199991, 284.0043509619991]  
average: 0.005130848499987906  
chordmem: [73, 75, 82] deltamem [283.9940892649991, 283.9979390199991, 284.0043509619991]  
b chordmem: [73, 75, 82, 80] b deltamem [283.9940892649991, 283.9979390199991, 284.0043509619991, 284.0060074199991]  
average: 0.003972718333329794  
b chordmem: [87, 85] b deltamem [285.5340554749992, 285.5230454149992]  
average: -0.011010059999989608  
chordmem: [87, 85] deltamem [285.5340554749992, 285.5230454149992]  
b chordmem: [87, 85, 94] b deltamem [285.5340554749992, 285.5230454149992, 285.5260717719992]  
average: -0.003991851499989707  
chordmem: [87, 85, 94] deltamem [285.5340554749992, 285.5230454149992, 285.5260717719992]  
b chordmem: [87, 85, 94, 92] b deltamem [285.5340554749992, 285.5230454149992, 285.5260717719992, 285.5299003049992]  
average: -0.0013850566666633313  
dynamics: [89]  
successor  
b chordmem: [85, 94] b deltamem [287.26306134699934, 287.2660415669993]  
average: 0.0029802199999835466  
chordmem: [85, 94] deltamem [287.26306134699934, 287.2660415669993]  
b chordmem: [85, 94, 87] b deltamem [287.26306134699934, 287.2660415669993, 287.2699227099993]  
average: 0.003430681499992261  
chordmem: [85, 94, 87] deltamem [287.26306134699934, 287.2660415669993, 287.2699227099993]

b chordmem: [85, 94, 87, 92] b deltamem [287.26306134699934,  
287.2660415669993, 287.2699227099993, 287.2741208919993]  
average: 0.0036865149999888067  
evaluate!  
[]  
b chordmem: [75, 73] b deltamem [288.03509506199924,  
288.0220546619993]  
average: -0.013040399999965757  
chordmem: [75, 73] deltamem [288.03509506199924, 288.0220546619993]  
greater than  
b chordmem: [75, 73, 82] b deltamem [288.03509506199924,  
288.0220546619993, 288.03206236499926]  
average: -0.001516348499990272  
chordmem: [75, 73, 82] deltamem [288.03509506199924,  
288.0220546619993, 288.03206236499926]  
b chordmem: [75, 73, 82, 80] b deltamem [288.03509506199924,  
288.0220546619993, 288.03206236499926, 288.04102085799923]  
average: 0.0019752653333284798  
evaluate!  
[]  
b chordmem: [75, 73] b deltamem [289.2521276369992,  
289.2440547699992]  
average: -0.008072867000009865  
chordmem: [75, 73] deltamem [289.2521276369992, 289.2440547699992]  
greater than  
b chordmem: [75, 73, 82] b deltamem [289.2521276369992,  
289.2440547699992, 289.2470529099992]  
average: -0.0025373635000107697  
chordmem: [75, 73, 82] deltamem [289.2521276369992,  
289.2440547699992, 289.2470529099992]  
b chordmem: [75, 73, 82, 80] b deltamem [289.2521276369992,  
289.2440547699992, 289.2470529099992, 289.2581070649992]  
average: 0.0019931426666630614  
b chordmem: [85, 87] b deltamem [290.03090411099913,  
290.0380939869991]  
average: 0.007189875999983997  
chordmem: [85, 87] deltamem [290.03090411099913, 290.0380939869991]  
b chordmem: [85, 87, 94] b deltamem [290.03090411099913,  
290.0380939869991, 290.02803969799913]  
average: -0.001432206499998756  
chordmem: [85, 87, 94] deltamem [290.03090411099913,  
290.0380939869991, 290.02803969799913]  
b chordmem: [85, 87, 94, 92] b deltamem [290.03090411099913,  
290.0380939869991, 290.02803969799913, 290.03397753799914]  
average: 0.0010244756666679677  
greater than  
b chordmem: [73, 75] b deltamem [291.00895102699906,  
291.0190719719991]  
average: 0.010120945000039683  
chordmem: [73, 75] deltamem [291.00895102699906, 291.0190719719991]  
evaluate!  
[]  
b chordmem: [73, 75, 82] b deltamem [291.00895102699906,  
291.0190719719991, 291.0130587799991]

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average: 0.0020538765000139847
chordmem: [73, 75, 82] deltamem [291.00895102699906,
291.0190719719991, 291.0130587799991]
b chordmem: [73, 75, 82, 80] b deltamem [291.00895102699906,
291.0190719719991, 291.0130587799991, 291.0230166999991]
average: 0.00468855766668715
addition
evaluate!
[]
this function can only process number expression functions as
argument! <function false at 0x10b5f09d8>
b chordmem: [75, 82] b deltamem [293.49991654099915,
293.50391228499916]
average: 0.003995744000008017
chordmem: [75, 82] deltamem [293.49991654099915,
293.50391228499916]
b chordmem: [75, 82, 80] b deltamem [293.49991654099915,
293.50391228499916, 293.50692822799914]
average: 0.0035058434999939436
chordmem: [75, 82, 80] deltamem [293.49991654099915,
293.50391228499916, 293.50692822799914]
greater than
dynamics: [90]
successor
b chordmem: [75, 82, 80, 76] b deltamem [293.50391228499916,
293.50692822799914, 294.7091506199991, 294.70503990499907]
average: 0.40037587333330293
chordmem: [82, 80, 76] deltamem [293.50692822799914,
294.7091506199991, 294.70503990499907]
b chordmem: [82, 80, 76] b deltamem [293.50692822799914,
294.7091506199991, 294.70503990499907, 294.7119034299991]
average: 0.4016584006666524
chordmem: [80, 76] deltamem [294.7091506199991, 294.70503990499907,
294.7119034299991]
greater than
evaluate!
[]
this function can only process number expression functions as
argument! <function false at 0x10b5f09d8>
dynamics: [90, 50]
successor
b chordmem: [80, 76] b deltamem [294.70503990499907,
294.7119034299991, 295.982072584999, 295.97100944999903]
average: 0.4219898483333206
chordmem: [76] deltamem [294.7119034299991, 295.982072584999,
295.97100944999903]
dynamics: [90, 50, 85]
successor
b chordmem: [76, 82] b deltamem [294.7119034299991,
295.982072584999, 295.97100944999903, 295.968064499999]
average: 0.41872035666663504
chordmem: [82] deltamem [295.982072584999, 295.97100944999903,
295.968064499999]
greater than
```

b chordmem: [82, 73, 76] b deltamem [295.97100944999903, 295.968064499999, 297.011923966999, 297.015028779999]  
average: 0.34800644333332303  
chordmem: [73, 76] deltamem [295.968064499999, 297.011923966999, 297.015028779999]  
dynamics: [90, 50, 85, 81]  
successor  
b chordmem: [73, 76, 80] b deltamem [295.968064499999, 297.011923966999, 297.015028779999, 297.021046984999]  
average: 0.3509941616666576  
chordmem: [76, 80] deltamem [297.011923966999, 297.015028779999, 297.021046984999]  
b chordmem: [76, 80, 82] b deltamem [297.011923966999, 297.015028779999, 297.021046984999, 297.00909291499903]  
average: -0.0009436839999921176  
chordmem: [76, 80, 82] deltamem [297.011923966999, 297.015028779999, 297.021046984999, 297.00909291499903]  
create new tree total trees: 5  
curent trees: {'1': {'shape': 4}, '2': {'shape': 6}, '3': {'shape': 4}, '4': {'shape': 5}, '5': {'shape': 1}}  
evaluate!  
[]  
b chordmem: [80, 82, 73, 75] b deltamem [297.015028779999, 297.021046984999, 297.00909291499903, 298.02717902999893, 298.02998799699895]  
average: 0.25373980424998877  
chordmem: [82, 73, 75] deltamem [297.021046984999, 297.00909291499903, 298.02717902999893, 298.02998799699895]  
dynamics: [90, 50, 85, 81, 80]  
successor  
b chordmem: [82, 73, 75, 80] b deltamem [297.00909291499903, 298.02717902999893, 298.02998799699895, 298.03515923499896]  
average: 0.3420221066666424  
chordmem: [73, 75, 80] deltamem [298.02717902999893, 298.02998799699895, 298.03515923499896]  
b chordmem: [73, 75, 80, 82] b deltamem [298.02717902999893, 298.02998799699895, 298.03515923499896, 298.02410832199894]  
average: -0.0010235693333318825  
go to next tree 1  
b chordmem: [73, 76] b deltamem [298.81707207999887, 298.8134333669989]  
average: -0.0036387129999866374  
chordmem: [73, 76] deltamem [298.81707207999887, 298.8134333669989]  
b chordmem: [73, 76, 82] b deltamem [298.81707207999887, 298.8134333669989, 298.8060161369989]  
average: -0.005527971499986961  
chordmem: [73, 76, 82] deltamem [298.81707207999887, 298.8134333669989, 298.8060161369989]  
identity  
succ head: 12  
rules now osc: [12]  
dynamics now: []  
b chordmem: [73, 76, 82, 80] b deltamem [298.81707207999887, 298.8134333669989, 298.8060161369989, 298.8291015499989]

average: 0.004009823333338621  
b chordmem: [80, 75] b deltamem [299.5411020949988, 299.5260474049988]  
average: -0.015054689999999482  
chordmem: [80, 75] deltamem [299.5411020949988, 299.5260474049988]  
b chordmem: [80, 75, 82] b deltamem [299.5411020949988, 299.5260474049988, 299.5230089619988]  
average: -0.009046566499989694  
chordmem: [80, 75, 82] deltamem [299.5411020949988, 299.5260474049988, 299.5230089619988]  
identity  
[12, 0]  
identity  
[12, 0, 0]  
identity  
[12, 0, 0, 0]  
identity  
[12, 0, 0, 0, 0]  
b chordmem: [80, 75, 82, 73] b deltamem [299.5260474049988, 299.5230089619988, 302.5050384899987, 302.5080592349987]  
average: 0.9940039433333064  
chordmem: [75, 82, 73] deltamem [299.5230089619988, 302.5050384899987, 302.5080592349987]  
b chordmem: [75, 82, 73] b deltamem [299.5230089619988, 302.5050384899987, 302.5080592349987, 302.5019609419987]  
average: 0.9929839933332877  
chordmem: [82, 73] deltamem [302.5050384899987, 302.5080592349987, 302.5019609419987]  
identity  
[12, 0, 0, 0, 0, 0]  
b chordmem: [82, 73, 80] b deltamem [302.5050384899987, 302.5080592349987, 302.5019609419987, 302.5120633349987]  
average: 0.002341614999996485  
chordmem: [82, 73, 80] deltamem [302.5050384899987, 302.5080592349987, 302.5019609419987, 302.5120633349987]  
b chordmem: [82, 73, 80, 75] b deltamem [302.5080592349987, 302.5019609419987, 302.5120633349987, 303.49609537499873, 303.5019045049988]  
average: 0.24846131750001632  
chordmem: [73, 80, 75] deltamem [302.5019609419987, 302.5120633349987, 303.49609537499873, 303.5019045049988]  
b chordmem: [73, 80, 75, 82] b deltamem [302.5120633349987, 303.49609537499873, 303.5019045049988, 303.49905990199875]  
average: 0.32899885566668746  
chordmem: [80, 75, 82] deltamem [303.49609537499873, 303.5019045049988, 303.49905990199875]  
identity  
[12, 0, 0, 0, 0, 0, 0]  
b chordmem: [80, 75, 82] b deltamem [303.49609537499873, 303.5019045049988, 303.49905990199875, 303.5070607069988]  
average: 0.003655110666689628  
chordmem: [80, 75, 82] deltamem [303.49609537499873, 303.5019045049988, 303.49905990199875, 303.5070607069988]  
dynamics: [71]





chord is assigned already. cannot overwrite  
chord is assigned already. cannot overwrite  
found ostinato! ['C#2', 'F#2', 'G#2', 'A#2']  
dynamics: [79]  
successor  
connection closed, trying to reconnect...  
error sending  
b chordmem: [37, 26, 84, 54] b deltamem [303.5070607069988,  
350.26595640199884, 350.24807493499884, 387.72208365199936,  
387.7270447819994]  
average: 21.054996018750145  
chordmem: [26, 84, 54] deltamem [350.26595640199884,  
350.24807493499884, 387.72208365199936, 387.7270447819994]  
dynamics: [79, 78]  
successor  
connection closed, trying to reconnect...  
web socket connected!  
error sending  
b chordmem: [26, 84, 54, 66] b deltamem [350.24807493499884,  
387.72208365199936, 387.7270447819994, 388.49104840699937,  
388.4861563319994]  
average: 9.559520349250135  
chordmem: [84, 54, 66] deltamem [387.72208365199936,  
387.7270447819994, 388.49104840699937, 388.4861563319994]  
dynamics: [79, 78, 93]  
successor  
web socket connected!  
b chordmem: [84, 54, 66, 61] b deltamem [387.7270447819994,  
388.49104840699937, 388.4861563319994, 388.9739353349994,  
388.9910734699994]  
average: 0.31600717199999906  
chordmem: [54, 66, 61] deltamem [388.49104840699937,  
388.4861563319994, 388.9739353349994, 388.9910734699994]  
compare: ['F#3', 'C#4', 'D#4', 'F#4']  
😞 ostinato was not developed correctly. Please try again  
first: ['C#2', 'F#2', 'G#2', 'A#2'] compare: ['F#3', 'C#4', 'D#4',  
'F#4']  
identity  
web socket connected!  
succ head: 3  
rules now osc: [12, 0, 0, 0, 0, 0, 0, 1, 1, 0, 0, 0, 0, 0, 0, 0,  
3]  
web socket connected!  
dynamics now: []  
b chordmem: [54, 66, 61, 82] b deltamem [388.4861563319994,  
388.9739353349994, 388.9910734699994, 389.73205514699947,  
389.7380417899995]  
average: 0.3129713645000294  
chordmem: [66, 61, 82] deltamem [388.9739353349994,  
388.9910734699994, 389.73205514699947, 389.7380417899995]  
identity  
[12, 0, 0, 0, 0, 0, 0, 1, 1, 0, 0, 0, 0, 0, 0, 0, 3, 0]  
b chordmem: [66, 61, 82] b deltamem [388.9910734699994,  
389.73205514699947, 389.7380417899995, 392.51392370999963,



392.5420624269996]  
average: 0.8877472392500607  
chordmem: [61, 82] deltamem [389.73205514699947, 389.7380417899995,  
392.51392370999963, 392.5420624269996]  
evaluate!  
[12, 0, 0, 0, 0, 0, 0, 1, 1, 0, 0, 0, 0, 0, 0, 0, 0, 3, 0]  
parsed rule: 12000000110000000030  
parsed dynamics:  
ckar rule : 12000000110000000030  
current tree: 1  
['.']  
identity  
['.', 0]  
b chordmem: [61, 82, 63] b deltamem [389.7380417899995,  
392.51392370999963, 392.5420624269996, 397.74202408699966,  
397.76352916199966]  
average: 2.0063718430000392  
chordmem: [82, 63] deltamem [392.51392370999963, 392.5420624269996,  
397.74202408699966, 397.76352916199966]  
evaluate!  
['.', 0]  
parsed rule: .0  
parsed dynamics: 0  
ckar rule : .0  
current tree: 1  
b chordmem: [82, 63, 83, 61] b deltamem [392.5420624269996,  
397.74202408699966, 397.76352916199966, 398.47594847499954,  
398.5049570549995]  
average: 1.4907236569999753  
chordmem: [63, 83, 61] deltamem [397.74202408699966,  
397.76352916199966, 398.47594847499954, 398.5049570549995]  
b chordmem: [83, 61, 68, 70] b deltamem [397.76352916199966,  
398.47594847499954, 398.5049570549995, 400.29703310499974,  
400.26895562699974]  
average: 0.6263566162500211  
chordmem: [61, 68, 70] deltamem [398.47594847499954,  
398.5049570549995, 400.29703310499974, 400.26895562699974]  
evaluate!  
[]  
b chordmem: [68, 70, 83, 67] b deltamem [398.5049570549995,  
400.29703310499974, 400.26895562699974, 406.5000482600001,  
406.5180127020001]  
average: 2.003263911750139  
chordmem: [70, 83, 67] deltamem [400.29703310499974,  
400.26895562699974, 406.5000482600001, 406.5180127020001]  
evaluate!  
[]  
b chordmem: [70, 83, 67, 58] b deltamem [400.26895562699974,  
406.5000482600001, 406.5180127020001, 407.0080856250001,  
407.0240866370001]  
average: 1.6887827525000887  
chordmem: [83, 67, 58] deltamem [406.5000482600001,  
406.5180127020001, 407.0080856250001, 407.0240866370001]  
evaluate!

[]  
b chordmem: [83, 67, 58, 66] b deltamem [406.5180127020001,  
407.0080856250001, 407.0240866370001, 407.51594180200004,  
407.52592935200005]  
average: 0.2519791624999925  
chordmem: [67, 58, 66] deltamem [407.0080856250001,  
407.0240866370001, 407.51594180200004, 407.52592935200005]  
evaluate!  
[]  
b chordmem: [67, 58, 66, 83] b deltamem [407.0240866370001,  
407.51594180200004, 407.52592935200005, 407.99303432500005,  
408.00600695]  
average: 0.24548007824998308  
chordmem: [58, 66, 83] deltamem [407.51594180200004,  
407.52592935200005, 407.99303432500005, 408.00600695]  
b chordmem: [66, 83, 63, 81] b deltamem [407.52592935200005,  
407.99303432500005, 408.00600695, 408.46003827500004,  
408.47610046200003]  
average: 0.2375427774999963  
chordmem: [83, 63, 81] deltamem [407.99303432500005, 408.00600695,  
408.46003827500004, 408.47610046200003]  
greater than  
identity  
[0]  
b chordmem: [63, 81, 82, 67] b deltamem [408.00600695,  
408.46003827500004, 408.47610046200003, 408.990981732,  
409.015010705]  
average: 0.25225093874999516  
chordmem: [81, 82, 67] deltamem [408.46003827500004,  
408.47610046200003, 408.990981732, 409.015010705]  
b chordmem: [82, 67, 63, 84] b deltamem [408.47610046200003,  
408.990981732, 409.015010705, 410.5020023080001, 410.4979317400001]  
average: 0.5054578195000232  
chordmem: [67, 63, 84] deltamem [408.990981732, 409.015010705,  
410.5020023080001, 410.4979317400001]  
dynamics: [92]  
successor  
dynamics: [92, 102]  
successor  
found ostinato! ['A#3', 'D#4', 'F#4', 'G4']  
dynamics: [92, 102, 100]  
successor  
b chordmem: [67, 63, 84] b deltamem [409.015010705,  
410.5020023080001, 410.4979317400001, 411.48804554000003,  
411.499953525]  
average: 0.6212357050000037  
chordmem: [63, 84] deltamem [410.5020023080001, 410.4979317400001,  
411.48804554000003, 411.499953525]  
dynamics: [92, 102, 100, 89]  
successor  
b chordmem: [63, 84, 67] b deltamem [410.4979317400001,  
411.48804554000003, 411.499953525, 411.98394179, 412.00503893]  
average: 0.3767767974999714  
chordmem: [84, 67] deltamem [411.48804554000003, 411.499953525,

411.98394179, 412.00503893]  
b chordmem: [84, 67, 63, 83] b deltamem [411.499953525,  
411.98394179, 412.00503893, 412.509009755, 412.49495887]  
average: 0.24875133624999535  
chordmem: [67, 63, 83] deltamem [411.98394179, 412.00503893,  
412.509009755, 412.49495887]  
evaluate!  
[0]  
dynamics: [92, 102, 100, 89, 91]  
successor  
compare: ['A#3', 'D#4', 'F#4', 'G4']  
ostinato did not change  
first: ['A#3', 'D#4', 'F#4', 'G4'] compare: ['A#3', 'D#4', 'F#4',  
'G4']  
b chordmem: [67, 63, 83, 84] b deltamem [412.00503893,  
412.509009755, 412.49495887, 416.5139332270001, 416.49704422000013]  
average: 1.1230013225000306  
chordmem: [63, 83, 84] deltamem [412.509009755, 412.49495887,  
416.5139332270001, 416.49704422000013]  
dynamics: [92, 102, 100, 89, 91, 92]  
successor  
b chordmem: [63, 83, 84, 58] b deltamem [412.49495887,  
416.5139332270001, 416.49704422000013, 417.26612337700004,  
417.24701378500004]  
average: 1.1880137287500077  
chordmem: [83, 84, 58] deltamem [416.5139332270001,  
416.49704422000013, 417.26612337700004, 417.24701378500004]  
dynamics: [92, 102, 100, 89, 91, 92, 96]  
successor  
identity  
succ head: 7  
rules now osc: [0, 7]  
dynamics now: []  
b chordmem: [84, 58, 82, 66] b deltamem [416.49704422000013,  
417.26612337700004, 417.24701378500004, 417.74090832699994,  
417.74903681199993]  
average: 0.31299814799994863  
chordmem: [58, 82, 66] deltamem [417.26612337700004,  
417.24701378500004, 417.74090832699994, 417.74903681199993]  
[0, 7, '.']  
identity  
[0, 7, '.', 0]  
b chordmem: [82, 66, 63, 83] b deltamem [417.24701378500004,  
417.74090832699994, 417.74903681199993, 423.98402309500005,  
424.00910703500006]  
average: 1.6905233125000052  
chordmem: [66, 63, 83] deltamem [417.74090832699994,  
417.74903681199993, 423.98402309500005, 424.00910703500006]  
evaluate!  
[0, 7, '.', 0]  
parsed rule: 07.0  
parsed dynamics: 0  
ckar rule : 07.0  
current tree: 1

b chordmem: [63, 83, 67, 84] b deltamem [417.74903681199993, 423.98402309500005, 424.00910703500006, 425.52498425500005, 425.51194511000006]  
average: 1.9407270745000318  
chordmem: [83, 67, 84] deltamem [423.98402309500005, 424.00910703500006, 425.52498425500005, 425.51194511000006]  
dynamics: [90]  
successor  
dynamics: [90, 100]  
successor  
b chordmem: [83, 67, 84, 63] b deltamem [424.00910703500006, 425.52498425500005, 425.51194511000006, 426.00708348200004, 426.02303428700003]  
average: 0.5034818129999934  
chordmem: [67, 84, 63] deltamem [425.52498425500005, 425.51194511000006, 426.00708348200004, 426.02303428700003]  
b chordmem: [67, 84, 63] b deltamem [425.51194511000006, 426.00708348200004, 426.02303428700003, 426.53407472699996, 426.51601433499997]  
average: 0.2510173062499774  
chordmem: [84, 63] deltamem [426.00708348200004, 426.02303428700003, 426.53407472699996, 426.51601433499997]  
dynamics: [90, 100, 104]  
successor  
found ostinato! ['A#3', 'D#4', 'F#4', 'G4']  
b chordmem: [84, 63, 82] b deltamem [426.02303428700003, 426.53407472699996, 426.51601433499997, 427.0220245919999, 426.9959335769999]  
average: 0.24322482249996824  
chordmem: [63, 82] deltamem [426.53407472699996, 426.51601433499997, 427.0220245919999, 426.9959335769999]  
identity  
succ head: 3  
rules now osc: [3]  
dynamics now: []  
b chordmem: [63, 82, 70, 75] b deltamem [426.51601433499997, 427.0220245919999, 426.9959335769999, 430.2641584969999, 430.2610454199999]  
average: 0.9362577712499842  
chordmem: [82, 70, 75] deltamem [427.0220245919999, 426.9959335769999, 430.2641584969999, 430.2610454199999]  
b chordmem: [82, 70, 75, 68] b deltamem [426.9959335769999, 430.2641584969999, 430.2610454199999, 431.73288797, 431.72906478799996]  
average: 1.1832828027500142  
chordmem: [70, 75, 68] deltamem [430.2641584969999, 430.2610454199999, 431.73288797, 431.72906478799996]  
b chordmem: [70, 75, 68] b deltamem [430.2610454199999, 431.73288797, 431.72906478799996, 431.724939137]  
average: 0.4879645723333586  
chordmem: [75, 68] deltamem [431.73288797, 431.72906478799996, 431.724939137]  
b chordmem: [75, 68, 70] b deltamem [431.72906478799996, 431.724939137, 433.02105475200005, 433.01395495700007]

average: 0.4282967230000357  
chordmem: [68, 70] deltamem [431.724939137, 433.02105475200005, 433.01395495700007]  
b chordmem: [68, 70, 75] b deltamem [431.724939137, 433.02105475200005, 433.01395495700007, 433.01700783000007]  
average: 0.43068956433336325  
chordmem: [70, 75] deltamem [433.02105475200005, 433.01395495700007, 433.01700783000007]  
b chordmem: [70, 75, 68] b deltamem [433.01395495700007, 433.01700783000007, 433.50095683, 433.513024782]  
average: 0.1663566083333118  
chordmem: [75, 68] deltamem [433.01700783000007, 433.50095683, 433.513024782]  
b chordmem: [75, 68] b deltamem [433.01700783000007, 433.50095683, 433.513024782, 433.50392463000003]  
average: 0.1623055999999868  
chordmem: [68] deltamem [433.50095683, 433.513024782, 433.50392463000003]  
b chordmem: [68, 70] b deltamem [433.513024782, 433.50392463000003, 433.77104824, 433.76806645000005]  
average: 0.0850138893333489  
chordmem: [70] deltamem [433.50392463000003, 433.77104824, 433.76806645000005]  
b chordmem: [70, 68, 75] b deltamem [433.50392463000003, 433.77104824, 433.76806645000005, 433.76307773200006]  
average: 0.0863843673333425  
chordmem: [68, 75] deltamem [433.77104824, 433.76806645000005, 433.76307773200006]  
[3, '.']  
b chordmem: [68, 75, 70] b deltamem [433.76806645000005, 433.76307773200006, 434.74904881500004, 434.73804944000005]  
average: 0.3233276633333351  
chordmem: [75, 70] deltamem [433.76307773200006, 434.74904881500004, 434.73804944000005]  
b chordmem: [75, 70] b deltamem [433.76307773200006, 434.74904881500004, 434.73804944000005, 434.74304435500005]  
average: 0.32665554099999855  
chordmem: [70] deltamem [434.74904881500004, 434.73804944000005, 434.74304435500005]  
dynamics: [92]  
successor  
b chordmem: [70, 84, 68] b deltamem [434.73804944000005, 434.74304435500005, 438.24750308199987, 438.25915271499986]  
average: 1.1737010916666009  
chordmem: [84, 68] deltamem [434.74304435500005, 438.24750308199987, 438.25915271499986]  
dynamics: [92, 91]  
successor  
b chordmem: [84, 68, 73] b deltamem [438.24750308199987, 438.25915271499986, 438.4980772299999, 438.5041156769999]  
average: 0.0855375316666785  
chordmem: [68, 73] deltamem [438.25915271499986, 438.4980772299999, 438.5041156769999]  
dynamics: [92, 91, 89]

successor  
b chordmem: [68, 73, 84] b deltamem [438.4980772299999, 438.5041156769999, 439.53589555199983, 439.5290563199998]  
average: 0.3436596966666343  
chordmem: [73, 84] deltamem [438.5041156769999, 439.53589555199983, 439.5290563199998]  
dynamics: [92, 91, 89, 92]  
successor  
b chordmem: [73, 84, 85] b deltamem [439.53589555199983, 439.5290563199998, 439.7558561119998, 439.76899627199975]  
average: 0.07770023999997495  
chordmem: [84, 85] deltamem [439.5290563199998, 439.7558561119998, 439.76899627199975]  
dynamics: [92, 91, 89, 92, 90]  
successor  
b chordmem: [84, 85, 66] b deltamem [439.7558561119998, 439.76899627199975, 440.2449833569998, 440.2632835769998]  
average: 0.16914248833334491  
chordmem: [85, 66] deltamem [439.76899627199975, 440.2449833569998, 440.2632835769998]  
dynamics: [92, 91, 89, 92, 90, 96]  
successor  
b chordmem: [85, 66, 73] b deltamem [440.2449833569998, 440.2632835769998, 440.7870123969998, 440.8080209669998]  
average: 0.1876792033333269  
chordmem: [66, 73] deltamem [440.2632835769998, 440.7870123969998, 440.8080209669998]  
dynamics: [92, 91, 89, 92, 90, 96, 82]  
successor  
b chordmem: [66, 73, 84] b deltamem [440.7870123969998, 440.8080209669998, 441.2840828099998, 441.2940519319998]  
average: 0.16901317833332996  
chordmem: [73, 84] deltamem [440.8080209669998, 441.2840828099998, 441.2940519319998]  
dynamics: [92, 91, 89, 92, 90, 96, 82, 89]  
successor  
b chordmem: [73, 84] b deltamem [441.2840828099998, 441.2940519319998, 441.77205389999983, 441.7919487199998]  
average: 0.16928863666667363  
chordmem: [84] deltamem [441.2940519319998, 441.77205389999983, 441.7919487199998]  
b chordmem: [84, 66, 85] b deltamem [441.77205389999983, 441.7919487199998, 442.2580733719998, 442.2510433149998]  
average: 0.1596631383333147  
chordmem: [66, 85] deltamem [441.7919487199998, 442.2580733719998, 442.2510433149998]  
dynamics: [92, 91, 89, 92, 90, 96, 82, 89, 78]  
successor  
b chordmem: [66, 85, 68, 84] b deltamem [442.2580733719998, 442.2510433149998, 442.5089346399998, 442.4969270669998]  
average: 0.07961789833332962  
chordmem: [85, 68, 84] deltamem [442.2510433149998, 442.5089346399998, 442.4969270669998]  
dynamics: [92, 91, 89, 92, 90, 96, 82, 89, 78, 82]

successor  
b chordmem: [68, 84, 73, 82] b deltamem [442.5089346399998, 442.4969270669998, 442.7616482599998, 442.7520833769998]  
average: 0.08104957900000424  
chordmem: [84, 73, 82] deltamem [442.4969270669998, 442.7616482599998, 442.7520833769998]  
identity  
succ head: 10  
rules now osc: [3, '.', 10]  
dynamics now: [88]  
dynamics: [89]  
successor  
b chordmem: [84, 73, 82, 66] b deltamem [442.7616482599998, 442.7520833769998, 444.51403249999976, 444.5180523069998]  
average: 0.5854680156666632  
chordmem: [73, 82, 66] deltamem [442.7520833769998, 444.51403249999976, 444.5180523069998]  
b chordmem: [82, 66, 68, 84] b deltamem [444.51403249999976, 444.5180523069998, 444.7608692899998, 444.7589330249998]  
average: 0.08163350833334941  
chordmem: [66, 68, 84] deltamem [444.5180523069998, 444.7608692899998, 444.7589330249998]  
dynamics: [89, 75]  
successor  
dynamics: [89, 75, 84]  
successor  
b chordmem: [66, 68, 84, 73] b deltamem [444.7608692899998, 444.7589330249998, 445.0001060999998, 445.0121349099998]  
average: 0.0837552066666755  
chordmem: [68, 84, 73] deltamem [444.7589330249998, 445.0001060999998, 445.0121349099998]  
b chordmem: [84, 73, 61, 85] b deltamem [445.0001060999998, 445.0121349099998, 445.24200971199986, 445.23807270199984]  
average: 0.07932220066667621  
chordmem: [73, 61, 85] deltamem [445.0121349099998, 445.24200971199986, 445.23807270199984]  
dynamics: [89, 75, 84, 82]  
successor  
dynamics: [89, 75, 84, 82, 78]  
successor  
b chordmem: [61, 85, 84, 66] b deltamem [445.24200971199986, 445.23807270199984, 445.4900768269999, 445.50193564199986]  
average: 0.0866419766666695  
chordmem: [85, 84, 66] deltamem [445.23807270199984, 445.4900768269999, 445.50193564199986]  
b chordmem: [84, 66, 68, 82] b deltamem [445.4900768269999, 445.50193564199986, 445.7660912399998, 445.75006076999983]  
average: 0.08666131433331732  
chordmem: [66, 68, 82] deltamem [445.50193564199986, 445.7660912399998, 445.75006076999983]  
identity  
succ head: 5  
rules now osc: [3, '.', 10, 5]  
dynamics now: [88, 82]

evaluate!  
[3, '.', 10, 5]  
parsed rule: 3.105  
parsed dynamics: 88|82  
ckar rule : 3.105  
current tree: 1  
b chordmem: [66, 68, 82, 83] b deltamem [445.7660912399998,  
445.75006076999983, 446.50307372699973, 446.52592118999974]  
average: 0.25327664999997523  
chordmem: [68, 82, 83] deltamem [445.75006076999983,  
446.50307372699973, 446.52592118999974]  
b chordmem: [82, 83, 70, 78] b deltamem [446.50307372699973,  
446.52592118999974, 455.4889938059998, 455.48610135499985]  
average: 2.9943425426667054  
chordmem: [83, 70, 78] deltamem [446.52592118999974,  
455.4889938059998, 455.48610135499985]  
b chordmem: [83, 70, 78, 75] b deltamem [455.4889938059998,  
455.48610135499985, 456.7511319619999, 456.74750224499985]  
average: 0.41950281300000825  
chordmem: [70, 78, 75] deltamem [455.48610135499985,  
456.7511319619999, 456.74750224499985]  
b chordmem: [78, 75, 61, 68] b deltamem [456.7511319619999,  
456.74750224499985, 457.2591297349999, 457.25404179999987]  
average: 0.16763661266666455  
chordmem: [75, 61, 68] deltamem [456.74750224499985,  
457.2591297349999, 457.25404179999987]  
b chordmem: [61, 68, 73, 78] b deltamem [457.2591297349999,  
457.25404179999987, 457.7340457669999, 457.7409559549999]  
average: 0.16060874000000544  
chordmem: [68, 73, 78] deltamem [457.25404179999987,  
457.7340457669999, 457.7409559549999]  
b chordmem: [68, 73, 78, 61] b deltamem [457.7340457669999,  
457.7409559549999, 458.2540459769999, 458.2450138869999]  
average: 0.1703227066666765  
chordmem: [73, 78, 61] deltamem [457.7409559549999,  
458.2540459769999, 458.2450138869999]  
b chordmem: [73, 78, 61] b deltamem [458.2540459769999,  
458.2450138869999, 458.50002993999993, 458.4920116149999]  
average: 0.0793218793333305  
chordmem: [78, 61] deltamem [458.2450138869999, 458.50002993999993,  
458.4920116149999]  
b chordmem: [78, 61, 73] b deltamem [458.50002993999993,  
458.4920116149999, 458.74401217499997, 458.74001441699994]  
average: 0.07999482566666909  
chordmem: [61, 73] deltamem [458.4920116149999, 458.74401217499997,  
458.74001441699994]  
b chordmem: [61, 73, 78] b deltamem [458.74401217499997,  
458.74001441699994, 459.02204267499997, 459.025066575]  
average: 0.09368480000000545  
chordmem: [73, 78] deltamem [458.74001441699994,  
459.02204267499997, 459.025066575]  
b chordmem: [73, 78, 66, 68] b deltamem [459.02204267499997,  
459.025066575, 459.261460287, 459.257015815]  
average: 0.07832438000000745



chordmem: [78, 66, 68] deltamem [459.025066575, 459.261460287, 459.257015815]  
b chordmem: [66, 68, 70, 75] b deltamem [459.261460287, 459.257015815, 459.761015315, 459.756098242]  
average: 0.16487931833334338  
chordmem: [68, 70, 75] deltamem [459.257015815, 459.761015315, 459.756098242]  
b chordmem: [68, 70, 75, 66] b deltamem [459.761015315, 459.756098242, 460.24613829500004, 460.24890610600005]  
average: 0.16263026366668024  
chordmem: [70, 75, 66] deltamem [459.756098242, 460.24613829500004, 460.24890610600005]  
b chordmem: [75, 66, 73, 78] b deltamem [460.24613829500004, 460.24890610600005, 460.4632119500001, 460.4709984000001]  
average: 0.07495336833335386  
chordmem: [66, 73, 78] deltamem [460.24890610600005, 460.4632119500001, 460.4709984000001]  
b chordmem: [66, 73, 78] b deltamem [460.4632119500001, 460.4709984000001, 460.7389176300001, 460.7320434170001]  
average: 0.08961048900001363  
chordmem: [73, 78] deltamem [460.4709984000001, 460.7389176300001, 460.7320434170001]  
b chordmem: [73, 78] b deltamem [460.7389176300001, 460.7320434170001, 461.0031000520001, 460.9950439470001]  
average: 0.0853754389999987  
chordmem: [78] deltamem [460.7320434170001, 461.0031000520001, 460.9950439470001]  
b chordmem: [78, 68, 66] b deltamem [461.0031000520001, 460.9950439470001, 461.2239247950002, 461.2120950020002]  
average: 0.06966498333336328  
chordmem: [68, 66] deltamem [460.9950439470001, 461.2239247950002, 461.2120950020002]  
b chordmem: [68, 66, 70, 75] b deltamem [461.2239247950002, 461.2120950020002, 461.4779603970002, 461.4659325320002]  
average: 0.08066924566666482  
chordmem: [66, 70, 75] deltamem [461.2120950020002, 461.4779603970002, 461.4659325320002]  
b chordmem: [66, 70, 75] b deltamem [461.4779603970002, 461.4659325320002, 461.7120398870002, 461.7091170950002]  
average: 0.07705223266666887  
chordmem: [70, 75] deltamem [461.4659325320002, 461.7120398870002, 461.7091170950002]  
b chordmem: [70, 75, 66, 68] b deltamem [461.7120398870002, 461.7091170950002, 461.9570605820002, 461.9539361570002]  
average: 0.08063209000001355  
chordmem: [75, 66, 68] deltamem [461.7091170950002, 461.9570605820002, 461.9539361570002]  
b chordmem: [66, 68, 73, 78] b deltamem [461.9570605820002, 461.9539361570002, 462.4930581370003, 462.50404121000025]  
average: 0.1823268760000095  
chordmem: [68, 73, 78] deltamem [461.9539361570002, 462.4930581370003, 462.50404121000025]  
b chordmem: [68, 73, 78] b deltamem [462.4930581370003, 462.50404121000025, 462.76792189500026, 462.7610861920003]

average: 0.08934268500000069  
chordmem: [73, 78] deltamem [462.50404121000025,  
462.76792189500026, 462.7610861920003]  
b chordmem: [73, 78] b deltamem [462.76792189500026,  
462.7610861920003, 463.00995025700024, 463.00602759500026]  
average: 0.07936856666666851  
chordmem: [78] deltamem [462.7610861920003, 463.00995025700024,  
463.00602759500026]  
b chordmem: [78, 66, 68] b deltamem [463.00995025700024,  
463.00602759500026, 463.2250915950002, 463.2279613450002]  
average: 0.07267036266665627  
chordmem: [66, 68] deltamem [463.00602759500026, 463.2250915950002,  
463.2279613450002]  
b chordmem: [66, 68, 70, 75] b deltamem [463.2250915950002,  
463.2279613450002, 463.49993579500017, 463.4941162920002]  
average: 0.08967489899998782  
chordmem: [68, 70, 75] deltamem [463.2279613450002,  
463.49993579500017, 463.4941162920002]  
b chordmem: [68, 70, 75] b deltamem [463.49993579500017,  
463.4941162920002, 463.7620658870001, 463.74604236700014]  
average: 0.08203552399999126  
chordmem: [70, 75] deltamem [463.4941162920002, 463.7620658870001,  
463.74604236700014]  
b chordmem: [70, 75, 66, 68] b deltamem [463.7620658870001,  
463.74604236700014, 464.0009128070001, 463.99613514200007]  
average: 0.0780230849999839  
chordmem: [75, 66, 68] deltamem [463.74604236700014,  
464.0009128070001, 463.99613514200007]  
b chordmem: [66, 68, 73, 78] b deltamem [464.0009128070001,  
463.99613514200007, 464.5141005970001, 464.5181008670001]  
average: 0.17239602000000787  
chordmem: [68, 73, 78] deltamem [463.99613514200007,  
464.5141005970001, 464.5181008670001]  
b chordmem: [68, 73, 78] b deltamem [464.5141005970001,  
464.5181008670001, 464.75693437000007, 464.7648770320001]  
average: 0.0835921449999925  
chordmem: [73, 78] deltamem [464.5181008670001, 464.75693437000007,  
464.7648770320001]  
b chordmem: [73, 78, 66, 70] b deltamem [464.75693437000007,  
464.7648770320001, 465.2864264870001, 465.2902064920001]  
average: 0.17775737400000935  
chordmem: [78, 66, 70] deltamem [464.7648770320001,  
465.2864264870001, 465.2902064920001]  
b chordmem: [78, 66, 70, 73] b deltamem [465.2864264870001,  
465.2902064920001, 465.7762149570001, 465.7864151200001]  
average: 0.16666287766666224  
chordmem: [66, 70, 73] deltamem [465.2902064920001,  
465.7762149570001, 465.7864151200001]  
b chordmem: [66, 70, 73] b deltamem [465.7762149570001,  
465.7864151200001, 466.2659247600001, 466.2689042850001]  
average: 0.16422977599999436  
chordmem: [70, 73] deltamem [465.7864151200001, 466.2659247600001,  
466.2689042850001]  
b chordmem: [70, 73, 75, 66] b deltamem [466.2659247600001,

466.2689042850001, 466.75827917000004, 466.76144983200004]  
average: 0.16517502399998799  
chordmem: [73, 75, 66] deltamem [466.2689042850001,  
466.75827917000004, 466.76144983200004]  
b chordmem: [73, 75, 66, 68] b deltamem [466.75827917000004,  
466.76144983200004, 467.971014295, 467.996027462]  
average: 0.4125827639999784  
chordmem: [75, 66, 68] deltamem [466.76144983200004, 467.971014295,  
467.996027462]  
compare: ['F#4', 'G#4', 'C#5', 'D#5']  
😞 ostinato was not developed correctly. Please try again  
first: ['A#3', 'D#4', 'F#4', 'G4'] compare: ['F#4', 'G#4', 'C#5',  
'D#5']  
collected trees: [1, 5]  
dynamics: [92]  
successor  
connection closed, trying to reconnect...  
error sending  
dynamics: [92, 92]  
successor  
connection closed, trying to reconnect...  
error sending  
b chordmem: [75, 66, 68, 84] b deltamem [467.971014295,  
467.996027462, 485.96293490500057, 485.98598547000057]  
average: 6.004990391666865  
chordmem: [66, 68, 84] deltamem [467.996027462, 485.96293490500057,  
485.98598547000057]  
dynamics: [92, 92, 93]  
successor  
connection closed, trying to reconnect...  
error sending  
found ostinato! ['F#4', 'G#4', 'A#4', 'C#5']  
b chordmem: [66, 68, 84, 73] b deltamem [485.96293490500057,  
485.98598547000057, 486.4680261000006, 486.4960724250006]  
average: 0.17771250666667507  
chordmem: [68, 84, 73] deltamem [485.98598547000057,  
486.4680261000006, 486.4960724250006]  
dynamics: [92, 92, 93, 93]  
successor  
connection closed, trying to reconnect...  
web socket connected!  
error sending  
dynamics: [92, 92, 93, 93, 99]  
successor  
web socket connected!  
b chordmem: [68, 84, 73] b deltamem [486.4680261000006,  
486.4960724250006, 487.47191363200074, 487.49202616000076]  
average: 0.3413333533333874  
chordmem: [84, 73] deltamem [486.4960724250006, 487.47191363200074,  
487.49202616000076]  
identity  
web socket connected!  
succ head: 5  
web socket connected!

rules now osc: [5]  
dynamics now: []  
collected trees: [1, 5]  
dynamics: [86]  
successor  
dynamics: [86, 80]  
successor  
b chordmem: [84, 73, 68] b deltamem [487.47191363200074,  
487.49202616000076, 500.4980474770007, 500.47839888000067]  
average: 4.335495082666644  
chordmem: [73, 68] deltamem [487.49202616000076, 500.4980474770007,  
500.47839888000067]  
dynamics: [86, 80, 86]  
successor  
collected trees: [1, 5]  
b chordmem: [73, 68, 84] b deltamem [500.4980474770007,  
500.47839888000067, 506.5180125150006, 506.5029231820006]  
average: 2.001625234999968  
chordmem: [68, 84] deltamem [500.47839888000067, 506.5180125150006,  
506.5029231820006]  
dynamics: [86, 80, 86, 84]  
successor  
b chordmem: [68, 84, 66, 85] b deltamem [506.5180125150006,  
506.5029231820006, 506.74655170000057, 506.7480489970006]  
average: 0.07667882733333424  
chordmem: [84, 66, 85] deltamem [506.5029231820006,  
506.74655170000057, 506.7480489970006]  
dynamics: [86, 80, 86, 84, 77]  
successor  
b chordmem: [84, 66, 85, 68] b deltamem [506.74655170000057,  
506.7480489970006, 507.01008019200054, 506.99096989500055]  
average: 0.08147273166666007  
chordmem: [66, 85, 68] deltamem [506.7480489970006,  
507.01008019200054, 506.99096989500055]  
dynamics: [86, 80, 86, 84, 77, 85]  
successor  
b chordmem: [85, 68, 75, 82] b deltamem [507.01008019200054,  
506.99096989500055, 507.47692420500056, 507.49906416500056]  
average: 0.16299465766667254  
chordmem: [68, 75, 82] deltamem [506.99096989500055,  
507.47692420500056, 507.49906416500056]  
identity  
succ head: 6  
rules now osc: [5, 6]  
dynamics now: []  
collected trees: [1, 5]  
b chordmem: [68, 75, 82, 66] b deltamem [507.47692420500056,  
507.49906416500056, 513.2900706120006, 513.2850827270006]  
average: 1.9360528406666806  
chordmem: [75, 82, 66] deltamem [507.49906416500056,  
513.2900706120006, 513.2850827270006]  
b chordmem: [75, 82, 66, 68] b deltamem [507.49906416500056,  
513.2900706120006, 513.2850827270006, 513.2819729720006]  
average: 1.927636269000023

chordmem: [82, 66, 68] deltamem [513.2900706120006,  
513.2850827270006, 513.2819729720006]  
b chordmem: [82, 66, 68, 75] b deltamem [513.2850827270006,  
513.2819729720006, 514.2579197770006, 514.2541130550005]  
average: 0.3230101093333057  
chordmem: [66, 68, 75] deltamem [513.2819729720006,  
514.2579197770006, 514.2541130550005]  
b chordmem: [66, 68, 75] b deltamem [514.2579197770006,  
514.2541130550005, 515.5080985500005, 515.4921111850005]  
average: 0.41139713599996713  
chordmem: [68, 75] deltamem [514.2541130550005, 515.5080985500005,  
515.4921111850005]  
b chordmem: [68, 75, 66] b deltamem [514.2541130550005,  
515.5080985500005, 515.4921111850005, 515.5020475670004]  
average: 0.4159781706666384  
chordmem: [75, 66] deltamem [515.5080985500005, 515.4921111850005,  
515.5020475670004]  
b chordmem: [75, 66, 73] b deltamem [515.4921111850005,  
515.5020475670004, 516.0370979670005, 516.0250227800004]  
average: 0.1776371983333244  
chordmem: [66, 73] deltamem [515.5020475670004, 516.0370979670005,  
516.0250227800004]  
b chordmem: [66, 73, 68, 75] b deltamem [516.0370979670005,  
516.0250227800004, 517.0099737800006, 517.0010665420006]  
average: 0.3213228583333603  
chordmem: [73, 68, 75] deltamem [516.0250227800004,  
517.0099737800006, 517.0010665420006]  
b chordmem: [73, 68, 75] b deltamem [517.0099737800006,  
517.0010665420006, 517.2378986950006, 517.2340410800006]  
average: 0.07468910000000051  
chordmem: [68, 75] deltamem [517.0010665420006, 517.2378986950006,  
517.2340410800006]  
b chordmem: [68, 75, 73] b deltamem [517.2378986950006,  
517.2340410800006, 517.7399072700005, 517.7351474870005]  
average: 0.1657495973333122  
chordmem: [75, 73] deltamem [517.2340410800006, 517.7399072700005,  
517.7351474870005]  
b chordmem: [75, 73, 68] b deltamem [517.7399072700005,  
517.7351474870005, 518.2321229620005, 518.2369468120005]  
average: 0.1656798473333462  
chordmem: [73, 68] deltamem [517.7351474870005, 518.2321229620005,  
518.2369468120005]  
b chordmem: [73, 68, 66, 70] b deltamem [518.2321229620005,  
518.2369468120005, 518.7609396100005, 518.7582328170005]  
average: 0.17536995166665292  
chordmem: [68, 66, 70] deltamem [518.2369468120005,  
518.7609396100005, 518.7582328170005]  
collected trees: [1, 5]  
dynamics: [71]  
successor  
dynamics: [71, 84]  
successor  
dynamics: [71, 84, 89]  
successor

```
identity
succ head: 3
rules now osc: [5, 6, 3]
dynamics now: []
evaluate!
[5, 6, 3]
parsed rule: 563
parsed dynamics:
ckar rule : 563
current tree: 1
b chordmem: [68, 66, 70, 84] b deltamem [518.7609396100005,
518.7582328170005, 535.9982733100005, 536.0040346670005]
average: 5.747698352333335
chordmem: [66, 70, 84] deltamem [518.7582328170005,
535.9982733100005, 536.0040346670005]
dynamics: [74]
successor
b chordmem: [70, 84, 69, 85] b deltamem [535.9982733100005,
536.0040346670005, 536.2600350520005, 536.2389544250005]
average: 0.08022703833334315
chordmem: [84, 69, 85] deltamem [536.0040346670005,
536.2600350520005, 536.2389544250005]
dynamics: [74, 77]
successor
b chordmem: [84, 69, 85, 75] b deltamem [536.2600350520005,
536.2389544250005, 536.5190748650004, 536.4984015050004]
average: 0.07945548433330411
chordmem: [69, 85, 75] deltamem [536.2389544250005,
536.5190748650004, 536.4984015050004]
dynamics: [74, 77, 83]
successor
b chordmem: [85, 75, 66, 82] b deltamem [536.5190748650004,
536.4984015050004, 537.2750237070004, 537.2500752900004]
average: 0.24366680833331125
chordmem: [75, 66, 82] deltamem [536.4984015050004,
537.2750237070004, 537.2500752900004]
identity
succ head: 3
rules now osc: [3]
dynamics now: []
collected trees: [1, 5, 3]
b chordmem: [66, 82, 33, 73] b deltamem [537.2750237070004,
537.2500752900004, 554.0250231200016, 554.0442466270016]
average: 5.589740973333733
chordmem: [82, 33, 73] deltamem [537.2500752900004,
554.0250231200016, 554.0442466270016]
b chordmem: [82, 33, 73, 75] b deltamem [554.0250231200016,
554.0442466270016, 558.5071449520021, 558.5019206070021]
average: 1.492299162333514
chordmem: [33, 73, 75] deltamem [554.0442466270016,
558.5071449520021, 558.5019206070021]
b chordmem: [33, 73, 75, 82] b deltamem [554.0442466270016,
558.5071449520021, 558.5019206070021, 558.4990490470021]
average: 1.4849341400001776
```

chordmem: [73, 75, 82] deltamem [558.5071449520021,  
558.5019206070021, 558.4990490470021]  
identity  
[3, 0]  
b chordmem: [73, 75, 82] b deltamem [558.5019206070021,  
558.4990490470021, 559.778217632002, 559.7720892050021]  
average: 0.42338953266664703  
chordmem: [75, 82] deltamem [558.4990490470021, 559.778217632002,  
559.7720892050021]  
b chordmem: [75, 82, 73] b deltamem [558.4990490470021,  
559.778217632002, 559.7720892050021, 559.775097900002]  
average: 0.42534961766663554  
chordmem: [82, 73] deltamem [559.778217632002, 559.7720892050021,  
559.775097900002]  
identity  
[3, 0, 0]  
b chordmem: [82, 73, 75] b deltamem [559.7720892050021,  
559.775097900002, 561.2510490450021, 561.2570567000021]  
average: 0.4949891649999927  
chordmem: [73, 75] deltamem [559.775097900002, 561.2510490450021,  
561.2570567000021]  
compare: ['F#4', 'A4', 'C#5', 'D#5']  
😞 ostinato was not developed correctly. Please try again  
first: ['F#4', 'G#4', 'A#4', 'C#5'] compare: ['F#4', 'A4', 'C#5',  
'D#5']  
b chordmem: [73, 75, 80] b deltamem [559.775097900002,  
561.2510490450021, 561.2570567000021, 561.260021467002]  
average: 0.4949745223333366  
chordmem: [75, 80] deltamem [561.2510490450021, 561.2570567000021,  
561.260021467002]  
dynamics: [89]  
successor  
dynamics: [89, 89]  
successor  
dynamics: [89, 89, 83]  
successor  
dynamics: [89, 89, 83, 86]  
successor  
dynamics: [89, 89, 83, 86, 75]  
successor  
identity  
succ head: 5  
rules now osc: [3, 0, 0, 5]  
dynamics now: []  
b chordmem: [75, 80, 46, 37] b deltamem [561.2570567000021,  
561.260021467002, 572.5021455820017, 572.5041116220017]  
average: 3.749018307333207  
chordmem: [80, 46, 37] deltamem [561.260021467002,  
572.5021455820017, 572.5041116220017]  
b chordmem: [80, 46, 37, 44] b deltamem [561.260021467002,  
572.5021455820017, 572.5041116220017, 572.5180621470017]  
average: 3.7526802266665604  
chordmem: [46, 37, 44] deltamem [572.5021455820017,  
572.5041116220017, 572.5180621470017]

b chordmem: [46, 37, 44, 42] b deltamem [572.5021455820017, 572.5041116220017, 572.5180621470017, 572.5210913870018]  
average: 0.006315268333347983  
drop: [1, 3]  
identity  
[0]  
identity  
[0, 0]  
dynamics: [83]  
successor  
dynamics: [83, 85]  
successor  
dynamics: [83, 85, 80]  
successor  
identity  
succ head: 3  
rules now osc: [0, 0, 3]  
dynamics now: []  
b chordmem: [46, 44] b deltamem [576.7529020320014, 576.7590591400015]  
average: 0.006157108000024891  
chordmem: [46, 44] deltamem [576.7529020320014, 576.7590591400015]  
b chordmem: [46, 44, 37] b deltamem [576.7529020320014, 576.7590591400015, 576.7500400870015]  
average: -0.0014309724999748141  
chordmem: [46, 44, 37] deltamem [576.7529020320014, 576.7590591400015, 576.7500400870015]  
b chordmem: [46, 44, 37, 42] b deltamem [576.7529020320014, 576.7590591400015, 576.7500400870015, 576.7640222600014]  
average: 0.0037067426666605265  
drop: [1]  
evaluate!  
[]  
dynamics: [57]  
successor  
evaluate!  
[]  
identity  
succ head: 1  
rules now osc: [1]  
dynamics now: []  
evaluate!  
[1]  
dynamics: [53]  
successor  
dynamics: [53, 56]  
successor  
identity  
succ head: 2  
rules now osc: [1, 2]  
dynamics now: []  
evaluate!  
[1, 2]  
parsed rule: 12



```
parsed dynamics:
ckar rule : 12
current tree: 1
dynamics: [56]
successor
dynamics: [56, 54]
successor
identity
succ head: 2
rules now osc: [2]
dynamics now: []
evaluate!
[2]
evaluate!
[2]
dynamics: [53]
successor
identity
succ head: 1
rules now osc: [2, 1]
dynamics now: []
evaluate!
[2, 1]
parsed rule: 21
parsed dynamics:
ckar rule : 21
current tree: 1
dynamics: [52]
successor
identity
succ head: 1
rules now osc: [1]
dynamics now: []
evaluate!
[1]
dynamics: [59]
successor
identity
succ head: 1
rules now osc: [1, 1]
dynamics now: []
evaluate!
[1, 1]
parsed rule: 11
parsed dynamics:
ckar rule : 11
current tree: 1
dynamics: [65]
successor
identity
succ head: 1
rules now osc: [1]
dynamics now: []
evaluate!
```

```
[1]
dynamics: [54]
successor
identity
succ head: 1
rules now osc: [1, 1]
dynamics now: []
evaluate!
[1, 1]
parsed rule: 11
parsed dynamics:
ckar rule : 11
current tree: 1
dynamics: [60]
successor
identity
succ head: 1
rules now osc: [1]
dynamics now: []
evaluate!
[1]
dynamics: [61]
successor
identity
succ head: 1
rules now osc: [1, 1]
dynamics now: []
[1, 1, '.']
dynamics: [75]
successor
dynamics: [75, 76]
successor
dynamics: [75, 76, 72]
successor
dynamics: [75, 76, 72, 68]
successor
identity
succ head: 4
rules now osc: [1, 1, '.', 4]
dynamics now: [73]
evaluate!
[1, 1, '.', 4]
parsed rule: 11.4
parsed dynamics: 73
ckar rule : 11.4
current tree: 1
dynamics: [92]
successor
identity
succ head: 1
rules now osc: [1]
dynamics now: []
[1, '.']
identity
```

[1, '.', 0]  
evaluate!  
[1, '.', 0]  
parsed rule: 1.0  
parsed dynamics: 0  
ckar rule : 1.0  
current tree: 1  
b chordmem: [60, 62] b deltamem [595.4978772570021,  
595.4961718440021]  
average: -0.001705412999967848  
chordmem: [60, 62] deltamem [595.4978772570021, 595.4961718440021]  
b chordmem: [60, 62, 68, 70] b deltamem [595.4978772570021,  
595.4961718440021, 596.7741316130019, 596.771081842002]  
average: 0.4244015283333056  
chordmem: [62, 68, 70] deltamem [595.4961718440021,  
596.7741316130019, 596.771081842002]  
b chordmem: [62, 68, 70, 75] b deltamem [595.4961718440021,  
596.7741316130019, 596.771081842002, 596.767065735002]  
average: 0.4236312969999669  
chordmem: [68, 70, 75] deltamem [596.7741316130019,  
596.771081842002, 596.767065735002]  
b chordmem: [68, 70, 75] b deltamem [596.771081842002,  
596.767065735002, 597.5211616960019, 597.5131860800019]  
average: 0.2473680793333036  
chordmem: [70, 75] deltamem [596.767065735002, 597.5211616960019,  
597.5131860800019]  
b chordmem: [70, 75] b deltamem [596.767065735002,  
597.5211616960019, 597.5131860800019, 597.5158850950019]  
average: 0.24960645333328557  
chordmem: [75] deltamem [597.5211616960019, 597.5131860800019,  
597.5158850950019]  
b chordmem: [75, 68, 70] b deltamem [597.5131860800019,  
597.5158850950019, 599.029254606002, 599.022935900002]  
average: 0.5032499400000461  
chordmem: [68, 70] deltamem [597.5158850950019, 599.029254606002,  
599.022935900002]  
b chordmem: [68, 70, 75] b deltamem [597.5158850950019,  
599.029254606002, 599.022935900002, 599.025905945002]  
average: 0.5033402833333867  
chordmem: [70, 75] deltamem [599.029254606002, 599.022935900002,  
599.025905945002]  
b chordmem: [70, 75, 68] b deltamem [599.022935900002,  
599.025905945002, 601.2630872400018, 601.2590637900018]  
average: 0.7453759633332689  
chordmem: [75, 68] deltamem [599.025905945002, 601.2630872400018,  
601.2590637900018]  
b chordmem: [75, 68, 78] b deltamem [599.025905945002,  
601.2630872400018, 601.2590637900018, 601.2560658620018]  
average: 0.7433866389999366  
chordmem: [68, 78] deltamem [601.2630872400018, 601.2590637900018,  
601.2560658620018]  
b chordmem: [68, 78, 69, 64] b deltamem [601.2590637900018,  
601.2560658620018, 601.7770359000017, 601.7839354370017]  
average: 0.17495721566660905

chordmem: [78, 69, 64] deltamem [601.2560658620018,  
601.7770359000017, 601.7839354370017]  
b chordmem: [78, 69, 64, 57] b deltamem [601.2560658620018,  
601.7770359000017, 601.7839354370017, 601.7720783070017]  
average: 0.17200414833329583  
chordmem: [69, 64, 57] deltamem [601.7770359000017,  
601.7839354370017, 601.7720783070017]  
b chordmem: [69, 64, 57, 70] b deltamem [601.7770359000017,  
601.7839354370017, 601.7720783070017, 601.7659122050018]  
average: -0.0037078983333079427  
b chordmem: [70, 68] b deltamem [601.7659122050018,  
601.7609209020018]  
average: -0.00499130299999706  
chordmem: [70, 68] deltamem [601.7659122050018, 601.7609209020018]  
b chordmem: [70, 68, 78] b deltamem [601.7659122050018,  
601.7609209020018, 601.7580951970018]  
average: -0.003908503999980439  
chordmem: [70, 68, 78] deltamem [601.7659122050018,  
601.7609209020018, 601.7580951970018]  
b chordmem: [68, 78, 62, 66] b deltamem [601.7609209020018,  
601.7580951970018, 602.5189219500016, 602.4900423050017]  
average: 0.2430404676666361  
chordmem: [78, 62, 66] deltamem [601.7580951970018,  
602.5189219500016, 602.4900423050017]  
b chordmem: [78, 62, 66, 65] b deltamem [601.7580951970018,  
602.5189219500016, 602.4900423050017, 602.4860035860016]  
average: 0.2426361296666073  
chordmem: [62, 66, 65] deltamem [602.5189219500016,  
602.4900423050017, 602.4860035860016]  
b chordmem: [62, 66, 65, 56] b deltamem [602.5189219500016,  
602.4900423050017, 602.4860035860016, 602.4970273670017]  
average: -0.0072981943333161325  
b chordmem: [56, 76] b deltamem [602.4970273670017,  
602.4790130000016]  
average: -0.018014367000091625  
chordmem: [56, 76] deltamem [602.4970273670017, 602.4790130000016]  
b chordmem: [56, 76, 69] b deltamem [602.4970273670017,  
602.4790130000016, 602.4829434180016]  
average: -0.007041974500054948  
chordmem: [56, 76, 69] deltamem [602.4970273670017,  
602.4790130000016, 602.4829434180016]  
b chordmem: [76, 69, 65, 55] b deltamem [602.4790130000016,  
602.4829434180016, 603.0059011350016, 603.0116865070016]  
average: 0.1775578356666756  
chordmem: [69, 65, 55] deltamem [602.4829434180016,  
603.0059011350016, 603.0116865070016]  
b chordmem: [69, 65, 55, 62] b deltamem [602.4829434180016,  
603.0059011350016, 603.0116865070016, 603.0130402070016]  
average: 0.17669892966667552  
chordmem: [65, 55, 62] deltamem [603.0059011350016,  
603.0116865070016, 603.0130402070016]  
b chordmem: [65, 55, 62, 68] b deltamem [603.0059011350016,  
603.0116865070016, 603.0130402070016, 603.0160339550016]  
average: 0.0033776066666556894

b chordmem: [68, 66] b deltamem [603.0160339550016, 602.9981152220016]  
average: -0.017918732999987697  
chordmem: [68, 66] deltamem [603.0160339550016, 602.9981152220016]  
b chordmem: [68, 66, 75] b deltamem [603.0160339550016, 602.9981152220016, 602.9999256060016]  
average: -0.00805417449998913  
chordmem: [68, 66, 75] deltamem [603.0160339550016, 602.9981152220016, 602.9999256060016]  
b chordmem: [66, 75, 63, 64] b deltamem [602.9981152220016, 602.9999256060016, 604.0338854820017, 604.0249505600017]  
average: 0.342278446000023  
chordmem: [75, 63, 64] deltamem [602.9999256060016, 604.0338854820017, 604.0249505600017]  
b chordmem: [75, 63, 64, 54] b deltamem [602.9999256060016, 604.0338854820017, 604.0249505600017, 604.0368980530017]  
average: 0.3456574823333464  
chordmem: [63, 64, 54] deltamem [604.0338854820017, 604.0249505600017, 604.0368980530017]  
b chordmem: [63, 64, 54, 74] b deltamem [604.0338854820017, 604.0249505600017, 604.0368980530017, 604.0160277400017]  
average: -0.00595258066664428  
b chordmem: [74, 69] b deltamem [604.0160277400017, 604.0120779200017]  
average: -0.003949820000002546  
chordmem: [74, 69] deltamem [604.0160277400017, 604.0120779200017]  
b chordmem: [74, 69, 64, 68] b deltamem [604.0160277400017, 604.0120779200017, 604.7819972780014, 604.7710319870015]  
average: 0.25166808233325355  
chordmem: [69, 64, 68] deltamem [604.0120779200017, 604.7819972780014, 604.7710319870015]  
b chordmem: [69, 64, 68, 59] b deltamem [604.0120779200017, 604.7819972780014, 604.7710319870015, 604.7758837680014]  
average: 0.25460194933323993  
chordmem: [64, 68, 59] deltamem [604.7819972780014, 604.7710319870015, 604.7758837680014]  
b chordmem: [64, 68, 59, 52] b deltamem [604.7819972780014, 604.7710319870015, 604.7758837680014, 604.7860209780014]  
average: 0.0013412333333159647  
b chordmem: [52, 63] b deltamem [604.7860209780014, 604.7600816450016]  
average: -0.02593933299976925  
chordmem: [52, 63] deltamem [604.7860209780014, 604.7600816450016]  
b chordmem: [52, 63, 73] b deltamem [604.7860209780014, 604.7600816450016, 604.7679267250015]  
average: -0.009047126499922342  
chordmem: [52, 63, 73] deltamem [604.7860209780014, 604.7600816450016, 604.7679267250015]  
b chordmem: [63, 73, 61, 72] b deltamem [604.7600816450016, 604.7679267250015, 605.4708817800016, 605.4549558100015]  
average: 0.2316247216666246  
chordmem: [73, 61, 72] deltamem [604.7679267250015, 605.4708817800016, 605.4549558100015]  
b chordmem: [73, 61, 72, 62] b deltamem [604.7679267250015,

605.4708817800016, 605.4549558100015, 605.4679012580016]  
average: 0.23332484433334835  
chordmem: [61, 72, 62] deltamem [605.4708817800016,  
605.4549558100015, 605.4679012580016]  
b chordmem: [61, 72, 62, 51] b deltamem [605.4708817800016,  
605.4549558100015, 605.4679012580016, 605.4649332700016]  
average: -0.0019828366666843067  
b chordmem: [51, 67] b deltamem [605.4649332700016,  
605.4571247500015]  
average: -0.007808520000025965  
chordmem: [51, 67] deltamem [605.4649332700016, 605.4571247500015]  
b chordmem: [51, 67, 62, 50] b deltamem [605.4649332700016,  
605.4571247500015, 606.2591057650016, 606.2527588000016]  
average: 0.2626085100000258  
chordmem: [67, 62, 50] deltamem [605.4571247500015,  
606.2591057650016, 606.2527588000016]  
b chordmem: [67, 62, 50, 57] b deltamem [605.4571247500015,  
606.2591057650016, 606.2527588000016, 606.2741808070016]  
average: 0.27235201900001965  
chordmem: [62, 50, 57] deltamem [606.2591057650016,  
606.2527588000016, 606.2741808070016]  
b chordmem: [62, 50, 57, 66] b deltamem [606.2591057650016,  
606.2527588000016, 606.2741808070016, 606.2622047720015]  
average: 0.0010330023333153804  
b chordmem: [66, 70] b deltamem [606.2622047720015,  
606.2470122420016]  
average: -0.015192529999922044  
chordmem: [66, 70] deltamem [606.2622047720015, 606.2470122420016]  
b chordmem: [66, 70, 61] b deltamem [606.2622047720015,  
606.2470122420016, 606.2552562820016]  
average: -0.0034742449999498604  
chordmem: [66, 70, 61] deltamem [606.2622047720015,  
606.2470122420016, 606.2552562820016]  
b chordmem: [70, 61, 54, 58] b deltamem [606.2470122420016,  
606.2552562820016, 607.0010295900015, 606.9985325880015]  
average: 0.2505067819999643  
chordmem: [61, 54, 58] deltamem [606.2552562820016,  
607.0010295900015, 606.9985325880015]  
b chordmem: [61, 54, 58, 59] b deltamem [606.2552562820016,  
607.0010295900015, 606.9985325880015, 606.9950927950015]  
average: 0.24661217099996216  
chordmem: [54, 58, 59] deltamem [607.0010295900015,  
606.9985325880015, 606.9950927950015]  
b chordmem: [54, 58, 59, 64] b deltamem [607.0010295900015,  
606.9985325880015, 606.9950927950015, 606.9900410250015]  
average: -0.003662855000015952  
b chordmem: [64, 69] b deltamem [606.9900410250015,  
606.9821164170014]  
average: -0.007924608000053013  
chordmem: [64, 69] deltamem [606.9900410250015, 606.9821164170014]  
found ostinato! ['F#3', 'A#3', 'B3', 'E4']  
b chordmem: [64, 69, 70, 76] b deltamem [606.9900410250015,  
606.9821164170014, 613.4800848270017, 613.4830041450017]  
average: 2.1643210400000803

chordmem: [69, 70, 76] deltamem [606.9821164170014,  
613.4800848270017, 613.4830041450017]  
b chordmem: [69, 70, 76, 75] b deltamem [613.4800848270017,  
613.4830041450017, 615.0150539100016, 615.0190456350016]  
average: 0.5129869359999475  
chordmem: [70, 76, 75] deltamem [613.4830041450017,  
615.0150539100016, 615.0190456350016]  
b chordmem: [70, 76, 75, 82] b deltamem [613.4830041450017,  
615.0150539100016, 615.0190456350016, 615.0079360000016]  
average: 0.5083106183332878  
chordmem: [76, 75, 82] deltamem [615.0150539100016,  
615.0190456350016, 615.0079360000016]  
identity  
[0]  
b chordmem: [76, 75, 82, 70] b deltamem [615.0190456350016,  
615.0079360000016, 615.2591669370016, 615.2611270920016]  
average: 0.08069381900001342  
chordmem: [75, 82, 70] deltamem [615.0079360000016,  
615.2591669370016, 615.2611270920016]  
b chordmem: [75, 82, 70] b deltamem [615.0079360000016,  
615.2591669370016, 615.2611270920016, 615.2560818270016]  
average: 0.08271527566667676  
chordmem: [82, 70] deltamem [615.2591669370016, 615.2611270920016,  
615.2560818270016]  
identity  
[0, 0]  
b chordmem: [82, 70, 69, 58] b deltamem [615.2611270920016,  
615.2560818270016, 615.5070894850015, 615.5089833820015]  
average: 0.0826187633332817  
chordmem: [70, 69, 58] deltamem [615.2560818270016,  
615.5070894850015, 615.5089833820015]  
b chordmem: [70, 69, 58, 64] b deltamem [615.2560818270016,  
615.5070894850015, 615.5089833820015, 615.5202732400015]  
average: 0.08806380433331167  
chordmem: [69, 58, 64] deltamem [615.5070894850015,  
615.5089833820015, 615.5202732400015]  
b chordmem: [58, 64, 75, 80] b deltamem [615.5089833820015,  
615.5202732400015, 615.7611006450016, 615.7585570400016]  
average: 0.08319121933338162  
chordmem: [64, 75, 80] deltamem [615.5202732400015,  
615.7611006450016, 615.7585570400016]  
b chordmem: [75, 80, 69, 57] b deltamem [615.7611006450016,  
615.7585570400016, 616.2459402970015, 616.2513917300015]  
average: 0.1634303616666178  
chordmem: [80, 69, 57] deltamem [615.7585570400016,  
616.2459402970015, 616.2513917300015]  
b chordmem: [80, 69, 57, 64] b deltamem [615.7585570400016,  
616.2459402970015, 616.2513917300015, 616.2539232550015]  
average: 0.16512207166662543  
chordmem: [69, 57, 64] deltamem [616.2459402970015,  
616.2513917300015, 616.2539232550015]  
b chordmem: [57, 64, 75, 70] b deltamem [616.2513917300015,  
616.2539232550015, 616.7395674100017, 616.7470960200017]  
average: 0.1652347633333875

chordmem: [64, 75, 70] deltamem [616.2539232550015,  
616.7395674100017, 616.7470960200017]  
b chordmem: [64, 75, 70, 79] b deltamem [616.2539232550015,  
616.7395674100017, 616.7470960200017, 616.7419085900017]  
average: 0.16266177833339648  
chordmem: [75, 70, 79] deltamem [616.7395674100017,  
616.7470960200017, 616.7419085900017]  
b chordmem: [70, 79, 66, 63] b deltamem [616.7470960200017,  
616.7419085900017, 617.2360083700016, 617.2420624880016]  
average: 0.16498882266663864  
chordmem: [79, 66, 63] deltamem [616.7419085900017,  
617.2360083700016, 617.2420624880016]  
b chordmem: [79, 66, 63, 56] b deltamem [616.7419085900017,  
617.2360083700016, 617.2420624880016, 617.2330406870017]  
average: 0.16371069899999688  
chordmem: [66, 63, 56] deltamem [617.2360083700016,  
617.2420624880016, 617.2330406870017]  
b chordmem: [63, 56, 69, 74] b deltamem [617.2420624880016,  
617.2330406870017, 617.5055331100016, 617.5021122500016]  
average: 0.08668325399999806  
chordmem: [56, 69, 74] deltamem [617.2330406870017,  
617.5055331100016, 617.5021122500016]  
b chordmem: [56, 69, 74, 78] b deltamem [617.2330406870017,  
617.5055331100016, 617.5021122500016, 617.4990310550015]  
average: 0.08866345599994929  
chordmem: [69, 74, 78] deltamem [617.5055331100016,  
617.5021122500016, 617.4990310550015]  
b chordmem: [74, 78, 55, 65] b deltamem [617.5021122500016,  
617.4990310550015, 618.5081154450015, 618.5231078870015]  
average: 0.3403318789999806  
chordmem: [78, 55, 65] deltamem [617.4990310550015,  
618.5081154450015, 618.5231078870015]  
b chordmem: [78, 55, 65, 62] b deltamem [617.4990310550015,  
618.5081154450015, 618.5231078870015, 618.5259234500015]  
average: 0.34229746500000147  
chordmem: [55, 65, 62] deltamem [618.5081154450015,  
618.5231078870015, 618.5259234500015]  
b chordmem: [55, 65, 62, 73] b deltamem [618.5081154450015,  
618.5231078870015, 618.5259234500015, 618.5190855500015]  
average: 0.0036567016666519216  
b chordmem: [73, 70] b deltamem [618.5190855500015,  
618.5153589550015]  
average: -0.0037265949999891745  
chordmem: [73, 70] deltamem [618.5190855500015, 618.5153589550015]  
b chordmem: [73, 70, 77] b deltamem [618.5190855500015,  
618.5153589550015, 618.5111023220015]  
average: -0.0039916139999718325  
chordmem: [73, 70, 77] deltamem [618.5190855500015,  
618.5153589550015, 618.5111023220015]  
b chordmem: [70, 77, 69, 66] b deltamem [618.5153589550015,  
618.5111023220015, 619.0249503120017, 619.0369022070017]  
average: 0.17384775066674743  
chordmem: [77, 69, 66] deltamem [618.5111023220015,  
619.0249503120017, 619.0369022070017]



b chordmem: [77, 69, 66, 72] b deltamem [618.5111023220015, 619.0249503120017, 619.0369022070017, 619.0181698320017]  
average: 0.16902250333339452  
chordmem: [69, 66, 72] deltamem [619.0249503120017, 619.0369022070017, 619.0181698320017]  
b chordmem: [66, 72, 63, 56] b deltamem [619.0369022070017, 619.0181698320017, 619.0489334820018, 619.0334998150017]  
average: -0.0011341306666660482  
b chordmem: [56, 76] b deltamem [619.0334998150017, 619.0215773770017]  
average: -0.01192243800005599  
chordmem: [56, 76] deltamem [619.0334998150017, 619.0215773770017]  
b chordmem: [56, 76, 57, 64] b deltamem [619.0334998150017, 619.0215773770017, 619.5579811270017, 619.5718620650016]  
average: 0.1794540833332879  
chordmem: [76, 57, 64] deltamem [619.0215773770017, 619.5579811270017, 619.5718620650016]  
b chordmem: [76, 57, 64, 72] b deltamem [619.0215773770017, 619.5579811270017, 619.5718620650016, 619.5649039950016]  
average: 0.18110887266664122  
chordmem: [57, 64, 72] deltamem [619.5579811270017, 619.5718620650016, 619.5649039950016]  
b chordmem: [57, 64, 72, 75] b deltamem [619.5579811270017, 619.5718620650016, 619.5649039950016, 619.5428833800017]  
average: -0.0050325823333044655  
b chordmem: [75, 68] b deltamem [619.5428833800017, 619.5619120080016]  
average: 0.01902862799988725  
chordmem: [75, 68] deltamem [619.5428833800017, 619.5619120080016]  
b chordmem: [75, 68, 67] b deltamem [619.5428833800017, 619.5619120080016, 619.5680557120016]  
average: 0.012586165999948662  
chordmem: [75, 68, 67] deltamem [619.5428833800017, 619.5619120080016, 619.5680557120016]  
b chordmem: [75, 68, 67, 58] b deltamem [619.5619120080016, 619.5680557120016, 620.0270316370013, 620.0482128450012]  
average: 0.1621002789998632  
chordmem: [68, 67, 58] deltamem [619.5680557120016, 620.0270316370013, 620.0482128450012]  
b chordmem: [68, 67, 58, 72] b deltamem [619.5680557120016, 620.0270316370013, 620.0482128450012, 620.0211195170014]  
average: 0.15102126833323837  
chordmem: [67, 58, 72] deltamem [620.0270316370013, 620.0482128450012, 620.0211195170014]  
b chordmem: [67, 58, 72, 66] b deltamem [620.0270316370013, 620.0482128450012, 620.0211195170014, 620.0413246270012]  
average: 0.00476432999998148  
b chordmem: [66, 74] b deltamem [620.0413246270012, 620.0158981360014]  
average: -0.025426490999848284  
chordmem: [66, 74] deltamem [620.0413246270012, 620.0158981360014]  
b chordmem: [66, 74, 59, 70] b deltamem [620.0413246270012, 620.0158981360014, 620.5320283200012, 620.5280696680012]  
average: 0.16224834699998306

chordmem: [74, 59, 70] deltamem [620.0158981360014,  
620.5320283200012, 620.5280696680012]  
b chordmem: [74, 59, 70, 67] b deltamem [620.0158981360014,  
620.5320283200012, 620.5280696680012, 620.5380899870013]  
average: 0.17406395033329622  
chordmem: [59, 70, 67] deltamem [620.5320283200012,  
620.5280696680012, 620.5380899870013]  
b chordmem: [59, 70, 67, 66] b deltamem [620.5320283200012,  
620.5280696680012, 620.5380899870013, 620.5348942920012]  
average: 0.0009553239999983513  
b chordmem: [71, 69] b deltamem [621.0360126300014,  
621.0290391070014]  
average: -0.006973523000056048  
chordmem: [71, 69] deltamem [621.0360126300014, 621.0290391070014]  
b chordmem: [71, 69, 58] b deltamem [621.0360126300014,  
621.0290391070014, 621.0464460620015]  
average: 0.005216716000006727  
chordmem: [71, 69, 58] deltamem [621.0360126300014,  
621.0290391070014, 621.0464460620015]  
b chordmem: [71, 69, 58, 67] b deltamem [621.0360126300014,  
621.0290391070014, 621.0464460620015, 621.0431418700015]  
average: 0.002376413333346742  
b chordmem: [67, 64] b deltamem [621.0431418700015,  
621.0600004450014]  
average: 0.016858574999901066  
chordmem: [67, 64] deltamem [621.0431418700015, 621.0600004450014]  
b chordmem: [67, 64, 72] b deltamem [621.0431418700015,  
621.0600004450014, 621.0320579120014]  
average: -0.005541979000042829  
chordmem: [67, 64, 72] deltamem [621.0431418700015,  
621.0600004450014, 621.0320579120014]  
b chordmem: [67, 64, 72, 76] b deltamem [621.0431418700015,  
621.0600004450014, 621.0320579120014, 621.0150424890014]  
average: -0.0093664603333353643  
b chordmem: [67, 57] b deltamem [621.3629011150017,  
621.3599226210017]  
average: -0.0029784939999899507  
chordmem: [67, 57] deltamem [621.3629011150017, 621.3599226210017]  
b chordmem: [67, 57, 64] b deltamem [621.3629011150017,  
621.3599226210017, 621.3890415920017]  
average: 0.013070238500006326  
chordmem: [67, 57, 64] deltamem [621.3629011150017,  
621.3599226210017, 621.3890415920017]  
b chordmem: [57, 64, 68, 75] b deltamem [621.3599226210017,  
621.3890415920017, 621.3440727870017, 621.3472938300017]  
average: -0.004209596999999121  
b chordmem: [67, 71] b deltamem [621.6921015270016,  
621.7009289970016]  
average: 0.00882747000002837  
chordmem: [67, 71] deltamem [621.6921015270016, 621.7009289970016]  
b chordmem: [67, 71, 64] b deltamem [621.6921015270016,  
621.7009289970016, 621.6970703050016]  
average: 0.0024843890000170177  
chordmem: [67, 71, 64] deltamem [621.6921015270016,

621.7009289970016, 621.6970703050016]  
b chordmem: [67, 71, 64, 56] b deltamem [621.6921015270016,  
621.7009289970016, 621.6970703050016, 621.6979052050016]  
average: 0.001934559333335282  
b chordmem: [56, 74] b deltamem [621.6979052050016,  
621.6813414420016]  
average: -0.016563763000021936  
chordmem: [56, 74] deltamem [621.6979052050016, 621.6813414420016]  
b chordmem: [56, 74, 64, 55] b deltamem [621.6979052050016,  
621.6813414420016, 622.0491340200016, 622.0328936650017]  
average: 0.11166282000003018  
chordmem: [74, 64, 55] deltamem [621.6813414420016,  
622.0491340200016, 622.0328936650017]  
b chordmem: [74, 64, 55, 68] b deltamem [621.6813414420016,  
622.0491340200016, 622.0328936650017, 622.0199539900017]  
average: 0.1128708493333761  
chordmem: [64, 55, 68] deltamem [622.0491340200016,  
622.0328936650017, 622.0199539900017]  
b chordmem: [64, 55, 68, 67] b deltamem [622.0491340200016,  
622.0328936650017, 622.0199539900017, 622.0260379000017]  
average: -0.0076987066666257915  
b chordmem: [67, 73] b deltamem [622.0260379000017,  
622.0229175260017]  
average: -0.0031203739999909885  
chordmem: [67, 73] deltamem [622.0260379000017, 622.0229175260017]  
b chordmem: [67, 73, 53] b deltamem [622.0260379000017,  
622.0229175260017, 622.5490341120017, 622.5520427520016]  
average: 0.17533495066663818  
chordmem: [73, 53] deltamem [622.0229175260017, 622.5490341120017,  
622.5520427520016]  
b chordmem: [73, 53, 67, 64] b deltamem [622.0229175260017,  
622.5490341120017, 622.5520427520016, 622.5630681270017]  
average: 0.1800502003333122  
chordmem: [53, 67, 64] deltamem [622.5490341120017,  
622.5520427520016, 622.5630681270017]  
b chordmem: [53, 67, 64, 68] b deltamem [622.5490341120017,  
622.5520427520016, 622.5630681270017, 622.5549408750016]  
average: 0.001968920999994831  
b chordmem: [68, 72] b deltamem [622.5549408750016,  
622.5401347850017]  
average: -0.014806089999979122  
chordmem: [68, 72] deltamem [622.5549408750016, 622.5401347850017]  
b chordmem: [68, 72, 67] b deltamem [622.5549408750016,  
622.5401347850017, 623.0500652130017, 623.0560353510018]  
average: 0.16703149200005404  
chordmem: [72, 67] deltamem [622.5401347850017, 623.0500652130017,  
623.0560353510018]  
b chordmem: [72, 67, 76] b deltamem [622.5401347850017,  
623.0500652130017, 623.0560353510018, 623.0379367470018]  
average: 0.1659339873333844  
chordmem: [67, 76] deltamem [623.0500652130017, 623.0560353510018,  
623.0379367470018]  
b chordmem: [67, 76, 54] b deltamem [623.0500652130017,  
623.0560353510018, 623.0379367470018, 623.0460424380018]

average: -0.001340924999984357  
chordmem: [67, 76, 54] deltamem [623.0500652130017,  
623.0560353510018, 623.0379367470018, 623.0460424380018]  
b chordmem: [67, 76, 54, 63] b deltamem [623.0560353510018,  
623.0379367470018, 623.0460424380018, 623.0610723100018]  
average: 0.0016789863333315225  
b chordmem: [63, 64] b deltamem [623.0610723100018,  
623.0530217730018]  
average: -0.008050537000031  
chordmem: [63, 64] deltamem [623.0610723100018, 623.0530217730018]  
b chordmem: [63, 64, 55, 72] b deltamem [623.0610723100018,  
623.0530217730018, 623.5341744360019, 623.5310906750019]  
average: 0.15667278833336695  
chordmem: [64, 55, 72] deltamem [623.0530217730018,  
623.5341744360019, 623.5310906750019]  
b chordmem: [64, 55, 72, 62] b deltamem [623.0530217730018,  
623.5341744360019, 623.5310906750019, 623.5360666400019]  
average: 0.1610149556667011  
chordmem: [55, 72, 62] deltamem [623.5341744360019,  
623.5310906750019, 623.5360666400019]  
b chordmem: [55, 72, 62, 64] b deltamem [623.5341744360019,  
623.5310906750019, 623.5360666400019, 623.5428078020019]  
average: 0.002877788666675466  
b chordmem: [64, 75] b deltamem [623.5428078020019,  
623.522281437002]  
average: -0.020526364999909674  
chordmem: [64, 75] deltamem [623.5428078020019, 623.522281437002]  
b chordmem: [64, 75, 66] b deltamem [623.5428078020019,  
623.522281437002, 623.526086077002]  
average: -0.008360862499955601  
chordmem: [64, 75, 66] deltamem [623.5428078020019,  
623.522281437002, 623.526086077002]  
b chordmem: [75, 66, 67, 65] b deltamem [623.522281437002,  
623.526086077002, 624.0668872120023, 624.0441686250022]  
average: 0.17396239600005478  
chordmem: [66, 67, 65] deltamem [623.526086077002,  
624.0668872120023, 624.0441686250022]  
b chordmem: [66, 67, 65, 56] b deltamem [623.526086077002,  
624.0668872120023, 624.0441686250022, 624.0481823620022]  
average: 0.17403209500006747  
chordmem: [67, 65, 56] deltamem [624.0668872120023,  
624.0441686250022, 624.0481823620022]  
b chordmem: [67, 65, 56, 64] b deltamem [624.0668872120023,  
624.0441686250022, 624.0481823620022, 624.0534821150022]  
average: -0.004468365666677225  
b chordmem: [64, 63] b deltamem [624.0534821150022,  
624.0640437500023]  
average: 0.010561635000044589  
chordmem: [64, 63] deltamem [624.0534821150022, 624.0640437500023]  
b chordmem: [64, 63, 74, 68] b deltamem [624.0534821150022,  
624.0640437500023, 624.0286725200021, 624.0319900420021]  
average: -0.007164024333368009  
b chordmem: [68, 64] b deltamem [624.4906805850022,  
624.5090202410022]

average: 0.018339655999966453  
chordmem: [68, 64] deltamem [624.4906805850022, 624.5090202410022]  
b chordmem: [68, 64, 73] b deltamem [624.4906805850022, 624.5090202410022, 624.4887065170022]  
average: -0.0009870339999906719  
chordmem: [68, 64, 73] deltamem [624.4906805850022, 624.5090202410022, 624.4887065170022]  
b chordmem: [68, 64, 73, 57] b deltamem [624.4906805850022, 624.5090202410022, 624.4887065170022, 624.4969036600022]  
average: 0.002074358333326624  
b chordmem: [57, 63] b deltamem [624.4969036600022, 624.5120939050022]  
average: 0.015190244999985225  
chordmem: [57, 63] deltamem [624.4969036600022, 624.5120939050022]  
b chordmem: [57, 63, 64, 67] b deltamem [624.4969036600022, 624.5120939050022, 625.0039940350025, 624.9979937620025]  
average: 0.16703003400008734  
chordmem: [63, 64, 67] deltamem [624.5120939050022, 625.0039940350025, 624.9979937620025]  
b chordmem: [63, 64, 67, 53] b deltamem [624.5120939050022, 625.0039940350025, 624.9979937620025, 624.9949100060024]  
average: 0.16093870033341773  
chordmem: [64, 67, 53] deltamem [625.0039940350025, 624.9979937620025, 624.9949100060024]  
b chordmem: [64, 67, 53, 76] b deltamem [625.0039940350025, 624.9979937620025, 624.9949100060024, 624.9881880550024]  
average: -0.005268660000031862  
b chordmem: [76, 72] b deltamem [624.9881880550024, 624.9907641770025]  
average: 0.002576122000050418  
chordmem: [76, 72] deltamem [624.9881880550024, 624.9907641770025]  
b chordmem: [76, 72, 63] b deltamem [624.9881880550024, 624.9907641770025, 625.0080559420026]  
average: 0.009933943500072928  
chordmem: [76, 72, 63] deltamem [624.9881880550024, 624.9907641770025, 625.0080559420026]  
b chordmem: [72, 63, 53, 64] b deltamem [624.9907641770025, 625.0080559420026, 625.3281452070024, 625.3350167530025]  
average: 0.11475085866667693  
chordmem: [63, 53, 64] deltamem [625.0080559420026, 625.3281452070024, 625.3350167530025]  
b chordmem: [63, 53, 64, 67] b deltamem [625.0080559420026, 625.3281452070024, 625.3350167530025, 625.3310783300025]  
average: 0.10767412933330434  
chordmem: [53, 64, 67] deltamem [625.3281452070024, 625.3350167530025, 625.3310783300025]  
b chordmem: [53, 64, 67, 76] b deltamem [625.3281452070024, 625.3350167530025, 625.3310783300025, 625.3208576150024]  
average: -0.0024291973333371666  
b chordmem: [76, 72] b deltamem [625.3208576150024, 625.3241168820024]  
average: 0.0032592669999758073  
chordmem: [76, 72] deltamem [625.3208576150024, 625.3241168820024]  
b chordmem: [76, 72, 63] b deltamem [625.3208576150024,

625.3241168820024, 625.3489019910025]  
average: 0.014022188000069491  
chordmem: [76, 72, 63] deltamem [625.3208576150024,  
625.3241168820024, 625.3489019910025]  
b chordmem: [76, 72, 63, 64] b deltamem [625.3241168820024,  
625.3489019910025, 625.6349156250025, 625.6410295270025]  
average: 0.10563754833337195  
chordmem: [72, 63, 64] deltamem [625.3489019910025,  
625.6349156250025, 625.6410295270025]  
b chordmem: [72, 63, 64, 54] b deltamem [625.3489019910025,  
625.6349156250025, 625.6410295270025, 625.6532320550025]  
average: 0.10144335466664718  
chordmem: [63, 64, 54] deltamem [625.6349156250025,  
625.6410295270025, 625.6532320550025]  
b chordmem: [63, 64, 54, 67] b deltamem [625.6349156250025,  
625.6410295270025, 625.6532320550025, 625.6290458570024]  
average: -0.0019565893333416775  
b chordmem: [67, 75] b deltamem [625.6290458570024,  
625.6250202000024]  
average: -0.004025657000056526  
chordmem: [67, 75] deltamem [625.6290458570024, 625.6250202000024]  
b chordmem: [67, 75, 63] b deltamem [625.6290458570024,  
625.6250202000024, 625.6390918400025]  
average: 0.005022991500027274  
chordmem: [67, 75, 63] deltamem [625.6290458570024,  
625.6250202000024, 625.6390918400025]  
b chordmem: [75, 63, 55, 64] b deltamem [625.6250202000024,  
625.6390918400025, 626.0360105700024, 626.0470106970024]  
average: 0.1406634990000081  
chordmem: [63, 55, 64] deltamem [625.6390918400025,  
626.0360105700024, 626.0470106970024]  
b chordmem: [63, 55, 64, 67] b deltamem [625.6390918400025,  
626.0360105700024, 626.0470106970024, 626.0313539300024]  
average: 0.13075402999997246  
chordmem: [55, 64, 67] deltamem [626.0360105700024,  
626.0470106970024, 626.0313539300024]  
b chordmem: [55, 64, 67, 68] b deltamem [626.0360105700024,  
626.0470106970024, 626.0313539300024, 626.0259335250024]  
average: -0.003359015000000909  
b chordmem: [68, 63] b deltamem [626.0259335250024,  
626.0509076700024]  
average: 0.024974144999987402  
chordmem: [68, 63] deltamem [626.0259335250024, 626.0509076700024]  
b chordmem: [68, 63, 67, 64] b deltamem [626.0259335250024,  
626.0509076700024, 626.5138762060026, 626.5190804770026]  
average: 0.16438231733339612  
chordmem: [63, 67, 64] deltamem [626.0509076700024,  
626.5138762060026, 626.5190804770026]  
b chordmem: [63, 67, 64, 56] b deltamem [626.0509076700024,  
626.5138762060026, 626.5190804770026, 626.5081001100026]  
average: 0.15239748000006634  
chordmem: [67, 64, 56] deltamem [626.5138762060026,  
626.5190804770026, 626.5081001100026]  
b chordmem: [67, 64, 56, 68] b deltamem [626.5138762060026,

626.5190804770026, 626.5081001100026, 626.5050009420027]  
average: -0.002958421333308555  
b chordmem: [63, 73] b deltamem [626.5358702950026,  
626.5119049700025]  
average: -0.023965325000062876  
chordmem: [63, 73] deltamem [626.5358702950026, 626.5119049700025]  
b chordmem: [63, 73, 67] b deltamem [626.5358702950026,  
626.5119049700025, 631.0220305150026]  
average: 2.2430801099999994  
chordmem: [73, 67] deltamem [626.5119049700025, 631.0220305150026]  
b chordmem: [73, 67, 79, 72] b deltamem [626.5119049700025,  
631.0220305150026, 632.9878997920026, 633.0038686920026]  
average: 2.1639879073333455  
chordmem: [67, 79, 72] deltamem [631.0220305150026,  
632.9878997920026, 633.0038686920026]  
b chordmem: [67, 79, 72, 64] b deltamem [632.9878997920026,  
633.0038686920026, 636.0219584700023, 636.0281106700023]  
average: 1.0134036259998993  
chordmem: [79, 72, 64] deltamem [633.0038686920026,  
636.0219584700023, 636.0281106700023]  
b chordmem: [72, 64, 78, 67] b deltamem [636.0219584700023,  
636.0281106700023, 636.0160159600024, 636.0249179450024]  
average: 0.0009864916666704933  
b chordmem: [64, 67] b deltamem [636.8060276600024,  
636.7812897500024]  
average: -0.02473790999999892  
chordmem: [64, 67] deltamem [636.8060276600024, 636.7812897500024]  
b chordmem: [64, 67, 72] b deltamem [636.8060276600024,  
636.7812897500024, 636.7741180420023]  
average: -0.015954809000049863  
chordmem: [64, 67, 72] deltamem [636.8060276600024,  
636.7812897500024, 636.7741180420023]  
b chordmem: [64, 67, 72, 63] b deltamem [636.8060276600024,  
636.7812897500024, 636.7741180420023, 636.7939043200024]  
average: -0.004041113333338823  
b chordmem: [63, 75] b deltamem [636.7939043200024,  
636.7779938750024]  
average: -0.01591044500003136  
chordmem: [63, 75] deltamem [636.7939043200024, 636.7779938750024]  
b chordmem: [63, 75, 55, 64] b deltamem [636.7939043200024,  
636.7779938750024, 637.5520161950021, 637.5689455850021]  
average: 0.25834708833322867  
chordmem: [75, 55, 64] deltamem [636.7779938750024,  
637.5520161950021, 637.5689455850021]  
b chordmem: [75, 55, 64, 63] b deltamem [636.7779938750024,  
637.5520161950021, 637.5689455850021, 637.572066382002]  
average: 0.26469083566655627  
chordmem: [55, 64, 63] deltamem [637.5520161950021,  
637.5689455850021, 637.572066382002]  
b chordmem: [55, 64, 63, 74] b deltamem [637.5520161950021,  
637.5689455850021, 637.572066382002, 637.5548989820021]  
average: 0.0009609289999919687  
b chordmem: [74, 67] b deltamem [637.5548989820021,  
637.5580196880021]

average: 0.0031207060000042475  
chordmem: [74, 67] deltamem [637.5548989820021, 637.5580196880021]  
b chordmem: [74, 67, 72] b deltamem [637.5548989820021, 637.5580196880021, 637.5490879870022]  
average: -0.002905497499966714  
chordmem: [74, 67, 72] deltamem [637.5548989820021, 637.5580196880021, 637.5490879870022]  
b chordmem: [67, 72, 52, 53] b deltamem [637.5580196880021, 637.5490879870022, 639.0360896570019, 639.0304871120019]  
average: 0.4908224746665913  
chordmem: [72, 52, 53] deltamem [637.5490879870022, 639.0360896570019, 639.0304871120019]  
b chordmem: [52, 53, 55, 57] b deltamem [639.0360896570019, 639.0304871120019, 640.7680810050018, 640.7660690170018]  
average: 0.576659786666634  
chordmem: [53, 55, 57] deltamem [639.0304871120019, 640.7680810050018, 640.7660690170018]  
b chordmem: [53, 55, 57, 64] b deltamem [639.0304871120019, 640.7680810050018, 640.7660690170018, 640.7530581370017]  
average: 0.5741903416666219  
chordmem: [55, 57, 64] deltamem [640.7680810050018, 640.7660690170018, 640.7530581370017]  
b chordmem: [55, 57, 64, 63] b deltamem [640.7680810050018, 640.7660690170018, 640.7530581370017, 640.7719092660018]  
average: 0.0012760869999889717  
b chordmem: [63, 78] b deltamem [640.7719092660018, 640.7419320220017]  
average: -0.029977244000065184  
chordmem: [63, 78] deltamem [640.7719092660018, 640.7419320220017]  
b chordmem: [63, 78, 72] b deltamem [640.7719092660018, 640.7419320220017, 640.7488832870017]  
average: -0.011512989500033655  
chordmem: [63, 78, 72] deltamem [640.7719092660018, 640.7419320220017, 640.7488832870017]  
b chordmem: [63, 78, 72, 67] b deltamem [640.7719092660018, 640.7419320220017, 640.7488832870017, 640.7469870270018]  
average: -0.008307413000011366  
b chordmem: [56, 77] b deltamem [641.5318637360017, 641.5149045760018]  
average: -0.01695915999994213  
chordmem: [56, 77] deltamem [641.5318637360017, 641.5149045760018]  
b chordmem: [56, 77, 64] b deltamem [641.5318637360017, 641.5149045760018, 641.5182391980018]  
average: -0.006812268999965454  
chordmem: [56, 77, 64] deltamem [641.5318637360017, 641.5149045760018, 641.5182391980018]  
b chordmem: [56, 77, 64, 72] b deltamem [641.5318637360017, 641.5149045760018, 641.5182391980018, 641.5120126450017]  
average: -0.006617030333321357  
b chordmem: [72, 67] b deltamem [641.5120126450017, 641.5199794850017]  
average: 0.00796683999999459  
chordmem: [72, 67] deltamem [641.5120126450017, 641.5199794850017]  
b chordmem: [72, 67, 63] b deltamem [641.5120126450017,



641.5199794850017, 641.5240330000017]  
average: 0.006010177500002101  
chordmem: [72, 67, 63] deltamem [641.5120126450017,  
641.5199794850017, 641.5240330000017]  
b chordmem: [72, 67, 63, 57] b deltamem [641.5199794850017,  
641.5240330000017, 642.2548672350016, 642.2660156380016]  
average: 0.2486787176666212  
chordmem: [67, 63, 57] deltamem [641.5240330000017,  
642.2548672350016, 642.2660156380016]  
b chordmem: [67, 63, 57, 64] b deltamem [641.5240330000017,  
642.2548672350016, 642.2660156380016, 642.2640325750016]  
average: 0.24666652499994748  
chordmem: [63, 57, 64] deltamem [642.2548672350016,  
642.2660156380016, 642.2640325750016]  
b chordmem: [63, 57, 64, 67] b deltamem [642.2548672350016,  
642.2660156380016, 642.2640325750016, 642.2519856170017]  
average: -0.0009605393333155613  
b chordmem: [67, 76] b deltamem [642.2519856170017,  
642.2485577220017]  
average: -0.0034278949999588804  
chordmem: [67, 76] deltamem [642.2519856170017, 642.2485577220017]  
b chordmem: [67, 76, 72] b deltamem [642.2519856170017,  
642.2485577220017, 642.2449641250017]  
average: -0.003510745999960818  
chordmem: [67, 76, 72] deltamem [642.2519856170017,  
642.2485577220017, 642.2449641250017]  
b chordmem: [76, 72, 61, 66] b deltamem [642.2485577220017,  
642.2449641250017, 648.0130617300018, 648.0100681500019]  
average: 1.9205034760000597  
chordmem: [72, 61, 66] deltamem [642.2449641250017,  
648.0130617300018, 648.0100681500019]  
b chordmem: [72, 61, 66, 70] b deltamem [642.2449641250017,  
648.0130617300018, 648.0100681500019, 648.0070521270019]  
average: 1.9206960006667184  
chordmem: [61, 66, 70] deltamem [648.0130617300018,  
648.0100681500019, 648.0070521270019]  
b chordmem: [61, 66, 70] b deltamem [648.0100681500019,  
648.0070521270019, 649.254255380002, 649.2569883970019]  
average: 0.4156400823333494  
chordmem: [66, 70] deltamem [648.0070521270019, 649.254255380002,  
649.2569883970019]  
b chordmem: [66, 70] b deltamem [648.0070521270019,  
649.254255380002, 649.2569883970019, 649.2479911150019]  
average: 0.41364632933334633  
chordmem: [70] deltamem [649.254255380002, 649.2569883970019,  
649.2479911150019]  
b chordmem: [70, 61, 66] b deltamem [649.2569883970019,  
649.2479911150019, 650.779877067002, 650.777926695002]  
average: 0.5069794326666776  
chordmem: [61, 66] deltamem [649.2479911150019, 650.779877067002,  
650.777926695002]  
b chordmem: [61, 66, 70] b deltamem [649.2479911150019,  
650.779877067002, 650.777926695002, 650.775158862002]  
average: 0.5090559156666737

chordmem: [66, 70] deltamem [650.779877067002, 650.777926695002, 650.775158862002]  
b chordmem: [66, 70, 61] b deltamem [650.777926695002, 650.775158862002, 651.505976482002, 651.5109726420019]  
average: 0.24434864899997896  
chordmem: [70, 61] deltamem [650.775158862002, 651.505976482002, 651.5109726420019]  
b chordmem: [70, 61] b deltamem [650.775158862002, 651.505976482002, 651.5109726420019, 651.5091378170019]  
average: 0.24465965166666592  
chordmem: [61] deltamem [651.505976482002, 651.5109726420019, 651.5091378170019]  
b chordmem: [61, 66] b deltamem [651.5109726420019, 651.5091378170019, 652.2120764370019, 652.2010036770018]  
average: 0.2300103449999824  
chordmem: [66] deltamem [651.5091378170019, 652.2120764370019, 652.2010036770018]  
b chordmem: [66, 70] b deltamem [651.5091378170019, 652.2120764370019, 652.2010036770018, 652.2040432720019]  
average: 0.23163515166663728  
chordmem: [70] deltamem [652.2120764370019, 652.2010036770018, 652.2040432720019]  
b chordmem: [70, 61, 66] b deltamem [652.2010036770018, 652.2040432720019, 652.7510416550018, 652.7399720020018]  
average: 0.17965610833330933  
chordmem: [61, 66] deltamem [652.2040432720019, 652.7510416550018, 652.7399720020018]  
b chordmem: [61, 66, 70] b deltamem [652.2040432720019, 652.7510416550018, 652.7399720020018, 652.7369690100018]  
average: 0.1776419126666345  
chordmem: [66, 70] deltamem [652.7510416550018, 652.7399720020018, 652.7369690100018]  
go to next tree 2  
b chordmem: [66, 70, 29, 61] b deltamem [652.7399720020018, 652.7369690100018, 653.5099689650018, 653.5189039370018]  
average: 0.25964397833335323  
chordmem: [70, 29, 61] deltamem [652.7369690100018, 653.5099689650018, 653.5189039370018]  
b chordmem: [70, 29, 61, 66] b deltamem [652.7369690100018, 653.5099689650018, 653.5189039370018, 653.5170262200019]  
average: 0.2600190700000364  
chordmem: [29, 61, 66] deltamem [653.5099689650018, 653.5189039370018, 653.5170262200019]  
b chordmem: [29, 61, 66, 70] b deltamem [653.5099689650018, 653.5189039370018, 653.5170262200019, 653.5135956670018]  
average: 0.0012089006666731923  
b chordmem: [66, 61] b deltamem [654.543532582002, 654.5320598200019]  
average: -0.011472762000039438  
chordmem: [66, 61] deltamem [654.543532582002, 654.5320598200019]  
b chordmem: [66, 61, 70] b deltamem [654.543532582002, 654.5320598200019, 654.5270349700019]  
average: -0.008248806000040076  
chordmem: [66, 61, 70] deltamem [654.543532582002,

654.5320598200019, 654.5270349700019]  
b chordmem: [66, 61, 70] b deltamem [654.5320598200019,  
654.5270349700019, 654.7760053170019, 654.7700663050019]  
average: 0.07933549500000936  
chordmem: [61, 70] deltamem [654.5270349700019, 654.7760053170019,  
654.7700663050019]  
b chordmem: [61, 70, 66] b deltamem [654.5270349700019,  
654.7760053170019, 654.7700663050019, 654.7650781250019]  
average: 0.07934771833333798  
chordmem: [70, 66] deltamem [654.7760053170019, 654.7700663050019,  
654.7650781250019]  
b chordmem: [70, 66, 61] b deltamem [654.7700663050019,  
654.7650781250019, 655.2810122550019, 655.2880084870019]  
average: 0.17264739399998538  
chordmem: [66, 61] deltamem [654.7650781250019, 655.2810122550019,  
655.2880084870019]  
b chordmem: [66, 61, 70] b deltamem [654.7650781250019,  
655.2810122550019, 655.2880084870019, 655.2790980120019]  
average: 0.17133996233333923  
chordmem: [61, 70] deltamem [655.2810122550019, 655.2880084870019,  
655.2790980120019]  
b chordmem: [61, 70, 66] b deltamem [655.2880084870019,  
655.2790980120019, 655.778049440002, 655.775048845002]  
average: 0.16234678600001948  
chordmem: [70, 66] deltamem [655.2790980120019, 655.778049440002,  
655.775048845002]  
greater than  
greater than  
identity  
[0, 0, 0]  
greater than  
identity  
[0, 0, 0, 0]  
b chordmem: [70, 66, 46, 37] b deltamem [655.778049440002,  
655.775048845002, 660.9929224000019, 660.989024702002]  
average: 1.7369917540000113  
chordmem: [66, 46, 37] deltamem [655.775048845002,  
660.9929224000019, 660.989024702002]  
b chordmem: [66, 46, 37, 44] b deltamem [655.775048845002,  
660.9929224000019, 660.989024702002, 661.0010793900019]  
average: 1.7420101816666527  
chordmem: [46, 37, 44] deltamem [660.9929224000019,  
660.989024702002, 661.0010793900019]  
b chordmem: [46, 37, 44, 42] b deltamem [660.9929224000019,  
660.989024702002, 661.0010793900019, 661.0030539380019]  
average: 0.0033771793333319997  
drop: []  
greater than  
identity  
[0]  
greater than  
identity  
[0, 0]  
greater than

b chordmem: [66, 76] b deltamem [674.0036865820017, 673.9820310420017]  
average: -0.021655539999983375  
chordmem: [66, 76] deltamem [674.0036865820017, 673.9820310420017]  
dynamics: [78]  
successor  
b chordmem: [66, 76] b deltamem [674.0036865820017, 673.9820310420017, 674.2230100400017, 674.2260200570016]  
average: 0.07411115833330466  
chordmem: [76] deltamem [673.9820310420017, 674.2230100400017, 674.2260200570016]  
dynamics: [78, 73]  
successor  
dynamics: [78, 73, 85]  
successor  
b chordmem: [76, 66] b deltamem [674.2230100400017, 674.2260200570016, 674.4757436120017, 674.4800614300017]  
average: 0.0856837966666717  
chordmem: [66] deltamem [674.2260200570016, 674.4757436120017, 674.4800614300017]  
identity  
succ head: 3  
rules now osc: [0, 0, 3]  
dynamics now: []  
b chordmem: [66, 76] b deltamem [674.4757436120017, 674.4800614300017, 675.4849298450015, 675.4741825720015]  
average: 0.3328129866666056  
chordmem: [76] deltamem [674.4800614300017, 675.4849298450015, 675.4741825720015]  
dynamics: [70]  
successor  
b chordmem: [76, 66] b deltamem [675.4849298450015, 675.4741825720015, 675.7063609900015, 675.7141240200015]  
average: 0.07639805833332503  
chordmem: [66] deltamem [675.4741825720015, 675.7063609900015, 675.7141240200015]  
dynamics: [70, 78]  
successor  
b chordmem: [66, 76] b deltamem [675.7063609900015, 675.7141240200015, 675.9660114270014, 675.9599412820014]  
average: 0.08452676399997472  
chordmem: [76] deltamem [675.7141240200015, 675.9660114270014, 675.9599412820014]  
dynamics: [70, 78, 82]  
successor  
b chordmem: [76, 71, 74] b deltamem [675.9660114270014, 675.9599412820014, 676.2120475750014, 676.2089808820014]  
average: 0.08098981833332648  
chordmem: [71, 74] deltamem [675.9599412820014, 676.2120475750014, 676.2089808820014]  
identity  
succ head: 3  
rules now osc: [0, 0, 3, 3]  
dynamics now: []

```
[0, 0, 3, 3, '.']
b chordmem: [71, 74, 66] b deltamem [676.2120475750014,
676.2089808820014, 679.7411365970013, 679.7599240650013]
average: 1.1826254966666359
chordmem: [74, 66] deltamem [676.2089808820014, 679.7411365970013,
679.7599240650013]
identity
[0, 0, 3, 3, '.', 0]
b chordmem: [74, 66, 71, 75] b deltamem [679.7411365970013,
679.7599240650013, 680.5361796070015, 680.5149293200014]
average: 0.25793090766671867
chordmem: [66, 71, 75] deltamem [679.7599240650013,
680.5361796070015, 680.5149293200014]
evaluate!
[0, 0, 3, 3, '.', 0]
parsed rule: 0033.0
parsed dynamics: 0
ckar rule : 0033.0
current tree: 2
3
b chordmem: [66, 71, 75, 76] b deltamem [680.5361796070015,
680.5149293200014, 682.0099375600016, 681.9879251300016]
average: 0.4839151743333711
chordmem: [71, 75, 76] deltamem [680.5149293200014,
682.0099375600016, 681.9879251300016]
dynamics: [92]
successor
dynamics: [92, 91]
successor
b chordmem: [71, 75, 76] b deltamem [682.0099375600016,
681.9879251300016, 682.5151067800016, 682.5319491850016]
average: 0.17400387500000156
chordmem: [75, 76] deltamem [681.9879251300016, 682.5151067800016,
682.5319491850016]
dynamics: [92, 91, 92]
successor
b chordmem: [75, 76, 71] b deltamem [682.5151067800016,
682.5319491850016, 682.9974716900017, 683.0170481870017]
average: 0.16731380233337254
chordmem: [76, 71] deltamem [682.5319491850016, 682.9974716900017,
683.0170481870017]
identity
succ head: 3
rules now osc: [3]
dynamics now: []
b chordmem: [76, 71, 66] b deltamem [682.9974716900017,
683.0170481870017, 684.4930203650016, 684.4849713170016]
average: 0.49583320899997335
chordmem: [71, 66] deltamem [683.0170481870017, 684.4930203650016,
684.4849713170016]
dynamics: [88]
successor
b chordmem: [71, 66, 76] b deltamem [684.4930203650016,
684.4849713170016, 684.7149611250015, 684.6989989100016]
```

average: 0.06865951499999785  
chordmem: [66, 76] deltamem [684.4849713170016, 684.7149611250015, 684.6989989100016]  
dynamics: [88, 73]  
successor  
b chordmem: [66, 76, 71] b deltamem [684.7149611250015, 684.6989989100016, 684.9929538350015, 684.9719257470015]  
average: 0.085654873999998044  
chordmem: [76, 71] deltamem [684.6989989100016, 684.9929538350015, 684.9719257470015]  
dynamics: [88, 73, 90]  
successor  
b chordmem: [76, 71, 66, 74] b deltamem [684.9929538350015, 684.9719257470015, 685.2290113650015, 685.2265821870014]  
average: 0.07787611733332749  
chordmem: [71, 66, 74] deltamem [684.9719257470015, 685.2290113650015, 685.2265821870014]  
identity  
succ head: 3  
rules now osc: [3, 3]  
dynamics now: []  
[3, 3, '.']  
b chordmem: [71, 66, 74, 76] b deltamem [685.2290113650015, 685.2265821870014, 689.5219055270015, 689.5181977000015]  
average: 1.429728778333318  
chordmem: [66, 74, 76] deltamem [685.2265821870014, 689.5219055270015, 689.5181977000015]  
dynamics: [71]  
successor  
dynamics: [71, 65]  
successor  
b chordmem: [66, 74, 76, 77] b deltamem [689.5219055270015, 689.5181977000015, 689.7720819500015, 689.7630446720015]  
average: 0.08037971499997336  
chordmem: [74, 76, 77] deltamem [689.5181977000015, 689.7720819500015, 689.7630446720015]  
b chordmem: [74, 76, 77, 71] b deltamem [689.7720819500015, 689.7630446720015, 690.0140561420014, 690.0119802850014]  
average: 0.0799661116666357  
chordmem: [76, 77, 71] deltamem [689.7630446720015, 690.0140561420014, 690.0119802850014]  
dynamics: [71, 65, 71]  
successor  
dynamics: [71, 65, 71, 68]  
successor  
b chordmem: [76, 77, 71, 66] b deltamem [690.0140561420014, 690.0119802850014, 690.2580756320014, 690.2480866950013]  
average: 0.0780101843333038  
chordmem: [77, 71, 66] deltamem [690.0119802850014, 690.2580756320014, 690.2480866950013]  
b chordmem: [77, 71, 66, 76] b deltamem [690.2580756320014, 690.2480866950013, 690.5170133420014, 690.5199325650015]  
average: 0.0872856443333679  
chordmem: [71, 66, 76] deltamem [690.2480866950013,

690.5170133420014, 690.5199325650015]  
dynamics: [71, 65, 71, 68, 72]  
successor  
b chordmem: [71, 66, 76, 77] b deltamem [690.5170133420014,  
690.5199325650015, 690.7620156020015, 690.7580681000015]  
average: 0.08035158600004404  
chordmem: [66, 76, 77] deltamem [690.5199325650015,  
690.7620156020015, 690.7580681000015]  
dynamics: [71, 65, 71, 68, 72, 74]  
successor  
b chordmem: [66, 76, 77, 71] b deltamem [690.7620156020015,  
690.7580681000015, 691.0220349170015, 691.0199710470015]  
average: 0.08598514833333108  
chordmem: [76, 77, 71] deltamem [690.7580681000015,  
691.0220349170015, 691.0199710470015]  
dynamics: [71, 65, 71, 68, 72, 74, 72]  
successor  
b chordmem: [77, 71, 66, 74] b deltamem [691.0220349170015,  
691.0199710470015, 691.2600407820015, 691.2490829600015]  
average: 0.07568268099998932  
chordmem: [71, 66, 74] deltamem [691.0199710470015,  
691.2600407820015, 691.2490829600015]  
identity  
succ head: 7  
rules now osc: [3, 3, '.', 7]  
dynamics now: [70]  
evaluate!  
[3, 3, '.', 7]  
parsed rule: 33.7  
parsed dynamics: 70  
ckar rule : 33.7  
current tree: 2  
b chordmem: [71, 66, 74, 75] b deltamem [691.2600407820015,  
691.2490829600015, 691.7430431720014, 691.7601520020014]  
average: 0.16670373999996477  
chordmem: [66, 74, 75] deltamem [691.2490829600015,  
691.7430431720014, 691.7601520020014]  
evaluate!  
[]  
b chordmem: [74, 75, 68, 70] b deltamem [691.7430431720014,  
691.7601520020014, 696.2930073220015, 696.2880536570015]  
average: 1.5150034950000115  
chordmem: [75, 68, 70] deltamem [691.7601520020014,  
696.2930073220015, 696.2880536570015]  
b chordmem: [75, 68, 70] b deltamem [691.7601520020014,  
696.2930073220015, 696.2880536570015, 696.2860845970015]  
average: 1.5086441983333618  
chordmem: [68, 70] deltamem [696.2930073220015, 696.2880536570015,  
696.2860845970015]  
evaluate!  
[]  
b chordmem: [68, 70, 66, 61] b deltamem [696.2880536570015,  
696.2860845970015, 696.7813025370016, 696.7760725750015]  
average: 0.16267297266669326

chordmem: [70, 66, 61] deltamem [696.2860845970015,  
696.7813025370016, 696.7760725750015]  
evaluate!  
[]  
addition  
evaluate!  
[]  
14  
evaluate!  
[]  
b chordmem: [66, 61, 75, 31] b deltamem [696.7813025370016,  
696.7760725750015, 701.7229357470015, 701.7019250470015]  
average: 1.6402075033333101  
chordmem: [61, 75, 31] deltamem [696.7760725750015,  
701.7229357470015, 701.7019250470015]  
transform tree 2  
greater than  
transform tree 2  
evaluate!  
[]  
greater than  
evaluate!  
[]  
b chordmem: [75, 31, 64, 62] b deltamem [701.7229357470015,  
701.7019250470015, 704.0234535550017, 704.0200486420016]  
average: 0.7657042983333516  
chordmem: [31, 64, 62] deltamem [701.7019250470015,  
704.0234535550017, 704.0200486420016]  
b chordmem: [31, 64, 62, 55] b deltamem [701.7019250470015,  
704.0234535550017, 704.0200486420016, 704.0160288420016]  
average: 0.7713679316666836  
chordmem: [64, 62, 55] deltamem [704.0234535550017,  
704.0200486420016, 704.0160288420016]  
b chordmem: [62, 55, 61, 66] b deltamem [704.0200486420016,  
704.0160288420016, 704.7776390930015, 704.7833617380015]  
average: 0.2544376986666445  
chordmem: [55, 61, 66] deltamem [704.0160288420016,  
704.7776390930015, 704.7833617380015]  
b chordmem: [55, 61, 66, 70] b deltamem [704.0160288420016,  
704.7776390930015, 704.7833617380015, 704.7799004800015]  
average: 0.25462387933331837  
chordmem: [61, 66, 70] deltamem [704.7776390930015,  
704.7833617380015, 704.7799004800015]  
b chordmem: [61, 66, 70, 62] b deltamem [704.7833617380015,  
704.7799004800015, 705.2840121150015, 705.2789026050015]  
average: 0.16518028899997717  
chordmem: [66, 70, 62] deltamem [704.7799004800015,  
705.2840121150015, 705.2789026050015]  
b chordmem: [70, 62, 61, 54] b deltamem [704.7799004800015,  
705.2840121150015, 705.2789026050015, 705.2751359950015]  
average: 0.16507850499999677  
chordmem: [62, 61, 54] deltamem [705.2840121150015,  
705.2789026050015, 705.2751359950015]  
b chordmem: [62, 61, 54, 70] b deltamem [705.2789026050015,



705.2751359950015, 705.7690568900015, 705.7659546720015]  
average: 0.162350689000012  
chordmem: [61, 54, 70] deltamem [705.2751359950015,  
705.7690568900015, 705.7659546720015]  
b chordmem: [54, 70, 62, 59] b deltamem [705.7690568900015,  
705.7659546720015, 706.0220283620013, 706.0160326820013]  
average: 0.08232526399994337  
chordmem: [70, 62, 59] deltamem [705.7659546720015,  
706.0220283620013, 706.0160326820013]  
b chordmem: [70, 62, 59, 53] b deltamem [705.7659546720015,  
706.0220283620013, 706.0160326820013, 706.0089270900013]  
average: 0.08099080599993158  
chordmem: [62, 59, 53] deltamem [706.0220283620013,  
706.0160326820013, 706.0089270900013]  
b chordmem: [62, 59, 53, 60] b deltamem [706.0160326820013,  
706.0089270900013, 706.548093115001, 706.5432412070011]  
average: 0.17573617499992147  
chordmem: [59, 53, 60] deltamem [706.0089270900013,  
706.548093115001, 706.5432412070011]  
b chordmem: [59, 53, 60, 67] b deltamem [706.0089270900013,  
706.548093115001, 706.5432412070011, 706.5281183400011]  
average: 0.1730637499999451  
chordmem: [53, 60, 67] deltamem [706.548093115001,  
706.5432412070011, 706.5281183400011]  
b chordmem: [60, 67, 58, 51] b deltamem [706.5432412070011,  
706.5281183400011, 706.766930005001, 706.772038432001]  
average: 0.07626574166662674  
chordmem: [67, 58, 51] deltamem [706.5281183400011,  
706.766930005001, 706.772038432001]  
b chordmem: [58, 51, 62, 66] b deltamem [706.766930005001,  
706.772038432001, 707.255294538001, 707.2470399620009]  
average: 0.16003665233332262  
chordmem: [51, 62, 66] deltamem [706.772038432001,  
707.255294538001, 707.2470399620009]  
b chordmem: [62, 66, 59, 57] b deltamem [707.255294538001,  
707.2470399620009, 707.785919425001, 707.779040507001]  
average: 0.17458198966668684  
chordmem: [66, 59, 57] deltamem [707.2470399620009,  
707.785919425001, 707.779040507001]  
b chordmem: [66, 59, 57, 50] b deltamem [707.2470399620009,  
707.785919425001, 707.779040507001, 707.776010035001]  
average: 0.17632335766669863  
chordmem: [59, 57, 50] deltamem [707.785919425001,  
707.779040507001, 707.776010035001]  
b chordmem: [57, 50, 62, 60] b deltamem [707.779040507001,  
707.776010035001, 708.2680118650011, 708.2729234150011]  
average: 0.16462763600001531  
chordmem: [50, 62, 60] deltamem [707.776010035001,  
708.2680118650011, 708.2729234150011]  
b chordmem: [50, 62, 60, 67] b deltamem [707.776010035001,  
708.2680118650011, 708.2729234150011, 708.2579763050011]  
average: 0.16065542333334784  
chordmem: [62, 60, 67] deltamem [708.2680118650011,  
708.2729234150011, 708.2579763050011]

b chordmem: [60, 67, 56, 49] b deltamem [708.2729234150011, 708.2579763050011, 708.5080451800011, 708.528955317001]  
average: 0.08534396733330141  
chordmem: [67, 56, 49] deltamem [708.2579763050011, 708.5080451800011, 708.528955317001]  
b chordmem: [67, 56, 49, 51] b deltamem [708.2579763050011, 708.5080451800011, 708.528955317001, 708.515092372001]  
average: 0.08570535566665664  
chordmem: [56, 49, 51] deltamem [708.5080451800011, 708.528955317001, 708.515092372001]  
b chordmem: [49, 51, 60, 61] b deltamem [708.528955317001, 708.515092372001, 709.4980408420009, 709.4939871350009]  
average: 0.3216772726666477  
chordmem: [51, 60, 61] deltamem [708.515092372001, 709.4980408420009, 709.4939871350009]  
b chordmem: [51, 60, 61, 66] b deltamem [708.515092372001, 709.4980408420009, 709.4939871350009, 709.4919657920009]  
average: 0.3256244733332778  
chordmem: [60, 61, 66] deltamem [709.4980408420009, 709.4939871350009, 709.4919657920009]  
compare: ['B2', 'B3', 'C4', 'C#4']  
compare: ['B3', 'C4', 'C#4', 'B2']  
compare: ['C4', 'C#4', 'B2', 'B3']  
compare: ['C#4', 'B2', 'B3', 'C4']  
compare: ['B2', 'B3', 'C4', 'C#4']  
compare: ['B3', 'C4', 'C#4', 'B3']  
😞 ostinato was not developed correctly. Please try again  
first: ['F#3', 'A#3', 'B3', 'E4'] compare: ['B3', 'C4', 'C#4', 'B3']  
b chordmem: [61, 66, 63, 62] b deltamem [709.4939871350009, 709.4919657920009, 726.765084897001, 726.7678763200009]  
average: 5.757963061666676  
chordmem: [66, 63, 62] deltamem [709.4919657920009, 726.765084897001, 726.7678763200009]  
b chordmem: [66, 63, 62, 70] b deltamem [709.4919657920009, 726.765084897001, 726.7678763200009, 726.760095960001]  
average: 5.756043389333361  
chordmem: [63, 62, 70] deltamem [726.765084897001, 726.7678763200009, 726.760095960001]  
evaluate!  
[]  
dynamics: [68]  
successor  
evaluate!  
[]  
dynamics: [68, 72]  
successor  
evaluate!  
[]  
evaluate!  
[]  
b chordmem: [62, 70, 75, 78] b deltamem [726.7678763200009, 726.760095960001, 732.5290382850005, 732.5120146470006]  
average: 1.914712775666544  
chordmem: [70, 75, 78] deltamem [726.760095960001,

```
732.5290382850005, 732.5120146470006]
addition
dynamics: [68, 72, 72]
successor
b chordmem: [75, 78, 87, 94] b deltamem [732.5290382850005,
732.5120146470006, 734.7518737860008, 734.7560761000009]
average: 0.7423459383334526
chordmem: [78, 87, 94] deltamem [732.5120146470006,
734.7518737860008, 734.7560761000009]
b chordmem: [78, 87, 94, 99] b deltamem [732.5120146470006,
734.7518737860008, 734.7560761000009, 734.7505269600008]
average: 0.7461707710000761
chordmem: [87, 94, 99] deltamem [734.7518737860008,
734.7560761000009, 734.7505269600008]
b chordmem: [94, 99, 82, 76] b deltamem [734.7560761000009,
734.7505269600008, 735.257084362001, 735.253994427001]
average: 0.16597277566669769
chordmem: [99, 82, 76] deltamem [734.7505269600008,
735.257084362001, 735.253994427001]
dynamics: [68, 72, 72, 79]
successor
b chordmem: [82, 76, 84, 91] b deltamem [735.257084362001,
735.253994427001, 735.7330654020011, 735.7289584370011]
average: 0.1572913583333578
chordmem: [76, 84, 91] deltamem [735.253994427001,
735.7330654020011, 735.7289584370011]
b chordmem: [76, 84, 91, 96] b deltamem [735.253994427001,
735.7330654020011, 735.7289584370011, 735.7189158020011]
average: 0.1549737916667103
chordmem: [84, 91, 96] deltamem [735.7330654020011,
735.7289584370011, 735.7189158020011]
b chordmem: [91, 96, 80, 75] b deltamem [735.7289584370011,
735.7189158020011, 735.9979522050012, 735.9910913050012]
average: 0.08737762266669809
chordmem: [96, 80, 75] deltamem [735.7189158020011,
735.9979522050012, 735.9910913050012]
evaluate!
[]
this function can only process number expression functions as
argument! <function false at 0x10b5f09d8>
b chordmem: [80, 75, 85, 91] b deltamem [735.9979522050012,
735.9910913050012, 736.5360107370011, 736.5250668520011]
average: 0.1757048823333207
chordmem: [75, 85, 91] deltamem [735.9910913050012,
736.5360107370011, 736.5250668520011]
b chordmem: [75, 85, 91, 97] b deltamem [735.9910913050012,
736.5360107370011, 736.5250668520011, 736.5142957470011]
average: 0.17440148066665037
chordmem: [85, 91, 97] deltamem [736.5360107370011,
736.5250668520011, 736.5142957470011]
b chordmem: [91, 97, 81, 74] b deltamem [736.5250668520011,
736.5142957470011, 736.7790676350012, 736.7679502000011]
average: 0.08096111599998797
chordmem: [97, 81, 74] deltamem [736.5142957470011,
```

736.7790676350012, 736.7679502000011]  
identity  
succ head: 4  
rules now osc: [4]  
dynamics now: []  
b chordmem: [97, 81, 74, 80] b deltamem [736.5142957470011,  
736.7790676350012, 736.7679502000011, 736.7759866520012]  
average: 0.08723030166667438  
chordmem: [81, 74, 80] deltamem [736.7790676350012,  
736.7679502000011, 736.7759866520012]  
b chordmem: [74, 80, 84, 91] b deltamem [736.7679502000011,  
736.7759866520012, 737.2670299700012, 737.2719478320012]  
average: 0.16799921066668352  
chordmem: [80, 84, 91] deltamem [736.7759866520012,  
737.2670299700012, 737.2719478320012]  
b chordmem: [80, 84, 91, 96] b deltamem [736.7759866520012,  
737.2670299700012, 737.2719478320012, 737.2629539300012]  
average: 0.16232242600002186  
chordmem: [84, 91, 96] deltamem [737.2670299700012,  
737.2719478320012, 737.2629539300012]  
b chordmem: [91, 96, 79, 78] b deltamem [737.2719478320012,  
737.2629539300012, 737.5230308570011, 737.5200713520011]  
average: 0.08270783999997396  
chordmem: [96, 79, 78] deltamem [737.2629539300012,  
737.5230308570011, 737.5200713520011]  
addition  
b chordmem: [96, 79, 78, 73] b deltamem [737.2629539300012,  
737.5230308570011, 737.5200713520011, 737.5069798750011]  
average: 0.0813419816666207  
chordmem: [79, 78, 73] deltamem [737.5230308570011,  
737.5200713520011, 737.5069798750011]  
greater than  
b chordmem: [78, 73, 84, 94] b deltamem [737.5200713520011,  
737.5069798750011, 738.0269614220012, 737.9980801620012]  
average: 0.1593362700000398  
chordmem: [73, 84, 94] deltamem [737.5069798750011,  
738.0269614220012, 737.9980801620012]  
b chordmem: [84, 94, 72, 77] b deltamem [738.0269614220012,  
737.9980801620012, 738.2599064350012, 738.2709557270013]  
average: 0.08133143500000035  
chordmem: [94, 72, 77] deltamem [737.9980801620012,  
738.2599064350012, 738.2709557270013]  
dynamics: [45]  
successor  
b chordmem: [94, 72, 77, 79] b deltamem [737.9980801620012,  
738.2599064350012, 738.2709557270013, 738.2550111320012]  
average: 0.08564365666666163  
chordmem: [72, 77, 79] deltamem [738.2599064350012,  
738.2709557270013, 738.2550111320012]  
b chordmem: [77, 79, 83, 88] b deltamem [738.2709557270013,  
738.2550111320012, 738.5561174450013, 738.5511877800013]  
average: 0.09341068433335901  
chordmem: [79, 83, 88] deltamem [738.2550111320012,  
738.5561174450013, 738.5511877800013]

b chordmem: [79, 83, 88, 93] b deltamem [738.2550111320012, 738.5561174450013, 738.5511877800013, 738.5379350850013]  
average: 0.09430798433337866  
chordmem: [83, 88, 93] deltamem [738.5561174450013, 738.5511877800013, 738.5379350850013]  
b chordmem: [88, 93, 71, 78] b deltamem [738.5511877800013, 738.5379350850013, 738.7619223070012, 738.7451444520012]  
average: 0.06465222399996644  
chordmem: [93, 71, 78] deltamem [738.5379350850013, 738.7619223070012, 738.7451444520012]  
addition  
b chordmem: [71, 78, 82, 87] b deltamem [738.7619223070012, 738.7451444520012, 739.0211889950011, 739.0120130470011]  
average: 0.08336357999996835  
chordmem: [78, 82, 87] deltamem [738.7451444520012, 739.0211889950011, 739.0120130470011]  
b chordmem: [78, 82, 87, 92] b deltamem [738.7451444520012, 739.0211889950011, 739.0120130470011, 739.0000102670011]  
average: 0.08495527166663426  
chordmem: [82, 87, 92] deltamem [739.0211889950011, 739.0120130470011, 739.0000102670011]  
b chordmem: [87, 92, 70, 77] b deltamem [739.0120130470011, 739.0000102670011, 739.2440147200011, 739.2494204420011]  
average: 0.07913579833333036  
chordmem: [92, 70, 77] deltamem [739.0000102670011, 739.2440147200011, 739.2494204420011]  
dynamics: [45, 67]  
successor  
b chordmem: [70, 77, 81, 86] b deltamem [739.2440147200011, 739.2494204420011, 739.488067268001, 739.491914942001]  
average: 0.0826334073332949  
chordmem: [77, 81, 86] deltamem [739.2494204420011, 739.488067268001, 739.491914942001]  
b chordmem: [77, 81, 86, 91] b deltamem [739.2494204420011, 739.488067268001, 739.491914942001, 739.475133617001]  
average: 0.0752377249999654  
chordmem: [81, 86, 91] deltamem [739.488067268001, 739.491914942001, 739.475133617001]  
dynamics: [45, 67, 83]  
successor  
b chordmem: [86, 91, 76, 69] b deltamem [739.491914942001, 739.475133617001, 739.735386347001, 739.7380105020011]  
average: 0.0820318533333572  
chordmem: [91, 76, 69] deltamem [739.475133617001, 739.735386347001, 739.7380105020011]  
b chordmem: [76, 69, 85, 80] b deltamem [739.735386347001, 739.7380105020011, 739.993104350001, 739.9869430950009]  
average: 0.08385224933329027  
chordmem: [69, 85, 80] deltamem [739.7380105020011, 739.993104350001, 739.9869430950009]  
b chordmem: [69, 85, 80, 90] b deltamem [739.7380105020011, 739.993104350001, 739.9869430950009, 739.979223667001]  
average: 0.0804043883332876  
chordmem: [85, 80, 90] deltamem [739.993104350001,

739.9869430950009, 739.979223667001]  
evaluate!  
[4]  
4  
b chordmem: [80, 90, 84, 79] b deltamem [739.9869430950009,  
739.979223667001, 740.3282379720008, 740.3139167500008]  
average: 0.10899121833328233  
chordmem: [90, 84, 79] deltamem [739.979223667001,  
740.3282379720008, 740.3139167500008]  
b chordmem: [90, 84, 79, 89] b deltamem [739.979223667001,  
740.3282379720008, 740.3139167500008, 740.3080173950008]  
average: 0.1095979093332744  
chordmem: [84, 79, 89] deltamem [740.3282379720008,  
740.3139167500008, 740.3080173950008]  
b chordmem: [79, 89, 67, 74] b deltamem [740.3139167500008,  
740.3080173950008, 740.4610379800007, 740.4519808820007]  
average: 0.046021377333318014  
chordmem: [89, 67, 74] deltamem [740.3080173950008,  
740.4610379800007, 740.4519808820007]  
identity  
succ head: 3  
rules now osc: [4, 3]  
dynamics now: []  
addition  
b chordmem: [67, 74, 78, 87] b deltamem [740.4610379800007,  
740.4519808820007, 740.6189313250006, 740.6218989000006]  
average: 0.05362030666663031  
chordmem: [74, 78, 87] deltamem [740.4519808820007,  
740.6189313250006, 740.6218989000006]  
greater than  
b chordmem: [78, 87, 73, 66] b deltamem [740.6189313250006,  
740.6218989000006, 740.7709279700007, 740.7808771800006]  
average: 0.05398195166666634  
chordmem: [87, 73, 66] deltamem [740.6218989000006,  
740.7709279700007, 740.7808771800006]  
dynamics: [85]  
successor  
b chordmem: [73, 66, 77, 82] b deltamem [740.7709279700007,  
740.7808771800006, 740.9860441620006, 740.9898966550005]  
average: 0.07298956166660749  
chordmem: [66, 77, 82] deltamem [740.7808771800006,  
740.9860441620006, 740.9898966550005]  
b chordmem: [66, 77, 82, 86] b deltamem [740.7808771800006,  
740.9860441620006, 740.9898966550005, 740.9820377750005]  
average: 0.06705353166663978  
chordmem: [77, 82, 86] deltamem [740.9860441620006,  
740.9898966550005, 740.9820377750005]  
b chordmem: [82, 86, 72, 65] b deltamem [740.9898966550005,  
740.9820377750005, 741.4769153900006, 741.4810749800006]  
average: 0.16372610833335935  
chordmem: [86, 72, 65] deltamem [740.9820377750005,  
741.4769153900006, 741.4810749800006]  
b chordmem: [72, 65, 80, 75] b deltamem [741.4769153900006,  
741.4810749800006, 741.9810356200005, 741.9710518900005]

average: 0.16471216666661803  
chordmem: [65, 80, 75] deltamem [741.4810749800006,  
741.9810356200005, 741.9710518900005]  
evaluate!  
[4, 3]  
parsed rule: 43  
parsed dynamics:  
ckar rule : 43  
current tree: 2  
3  
b chordmem: [65, 80, 75, 85] b deltamem [741.4810749800006,  
741.9810356200005, 741.9710518900005, 741.9680948920005]  
average: 0.16233997066664566  
chordmem: [80, 75, 85] deltamem [741.9810356200005,  
741.9710518900005, 741.9680948920005]  
['.']  
b chordmem: [75, 85, 64, 69] b deltamem [741.9710518900005,  
741.9680948920005, 742.7480157770007, 742.7521281070007]  
average: 0.2603587390000636  
chordmem: [85, 64, 69] deltamem [741.9680948920005,  
742.7480157770007, 742.7521281070007]  
b chordmem: [64, 69, 66, 63] b deltamem [742.7480157770007,  
742.7521281070007, 743.2799616520007, 743.2840706850006]  
average: 0.1786849693333276  
chordmem: [69, 66, 63] deltamem [742.7521281070007,  
743.2799616520007, 743.2840706850006]  
b chordmem: [69, 66, 63, 70] b deltamem [743.2799616520007,  
743.2840706850006, 743.7800440120008, 743.7859624450008]  
average: 0.16866693100003735  
chordmem: [66, 63, 70] deltamem [743.2840706850006,  
743.7800440120008, 743.7859624450008]  
b chordmem: [66, 63, 70, 75] b deltamem [743.2840706850006,  
743.7800440120008, 743.7859624450008, 743.7769762870007]  
average: 0.1643018673333548  
chordmem: [63, 70, 75] deltamem [743.7800440120008,  
743.7859624450008, 743.7769762870007]  
evaluate!  
['.']  
b chordmem: [70, 75, 69, 64] b deltamem [743.7859624450008,  
743.7769762870007, 744.2499592470008, 744.2638968570008]  
average: 0.15931147066665594  
chordmem: [75, 69, 64] deltamem [743.7769762870007,  
744.2499592470008, 744.2638968570008]  
b chordmem: [75, 69, 64, 57] b deltamem [743.7769762870007,  
744.2499592470008, 744.2638968570008, 744.2528520620008]  
average: 0.15862525833335894  
chordmem: [69, 64, 57] deltamem [744.2499592470008,  
744.2638968570008, 744.2528520620008]  
b chordmem: [69, 64, 57, 74] b deltamem [744.2638968570008,  
744.2528520620008, 744.5100477100007, 744.5140894200007]  
average: 0.08339752099997592  
chordmem: [64, 57, 74] deltamem [744.2528520620008,  
744.5100477100007, 744.5140894200007]  
identity

```
succ head: 1
/Library/Frameworks/Python.framework/Versions/3.7/lib/python3.7/
site-packages/numpy/lib/function_base.py:356: RuntimeWarning: Mean
of empty slice.
  avg = a.mean(axis)
/Library/Frameworks/Python.framework/Versions/3.7/lib/python3.7/
site-packages/numpy/core/_methods.py:85: RuntimeWarning: invalid
value encountered in double_scalars
  ret = ret.dtype.type(ret / rcount)
Traceback (most recent call last):
  File "codeklavier.py", line 227, in <module>
    perform(configfile=config, prototype=play)
  File "codeklavier.py", line 113, in perform
    eval(prototype.main())
  File "/Users/Anne/codeklavier/ckalculator/ckalculator.py", line
82, in main
    ck_deltatime=ck_deltatime, articulation=articulation)
  File "/Users/Anne/codeklavier/CodeKlavier/ckalculator_classes.py",
line 328, in parse_midi
    self.makeLS(sendToDisplay)
  File "/Users/Anne/codeklavier/CodeKlavier/ckalculator_classes.py",
line 1477, in makeLS
    velocity = int(numpy.average(self._dynamics).round())
ValueError: cannot convert float NaN to integer
anne:codeklavier Anne$
```