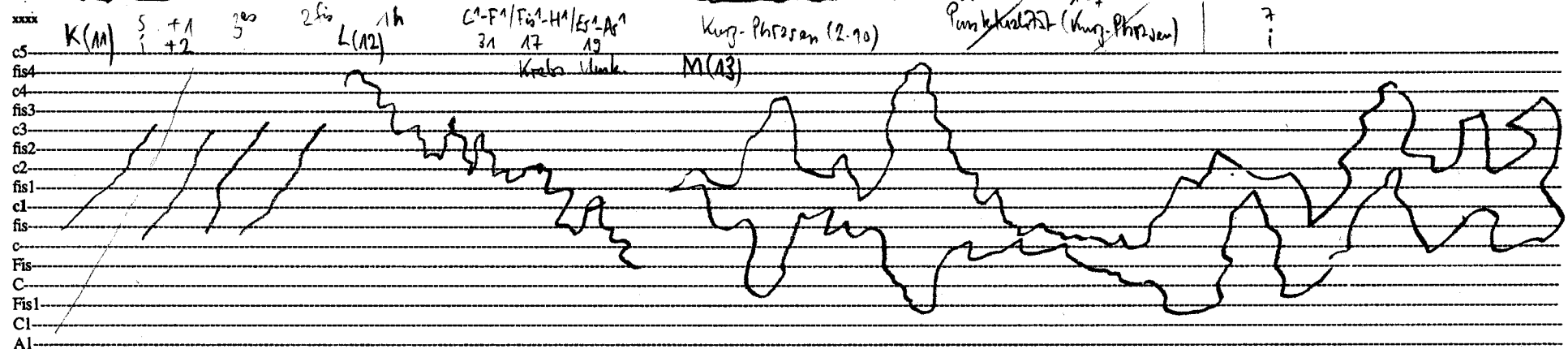
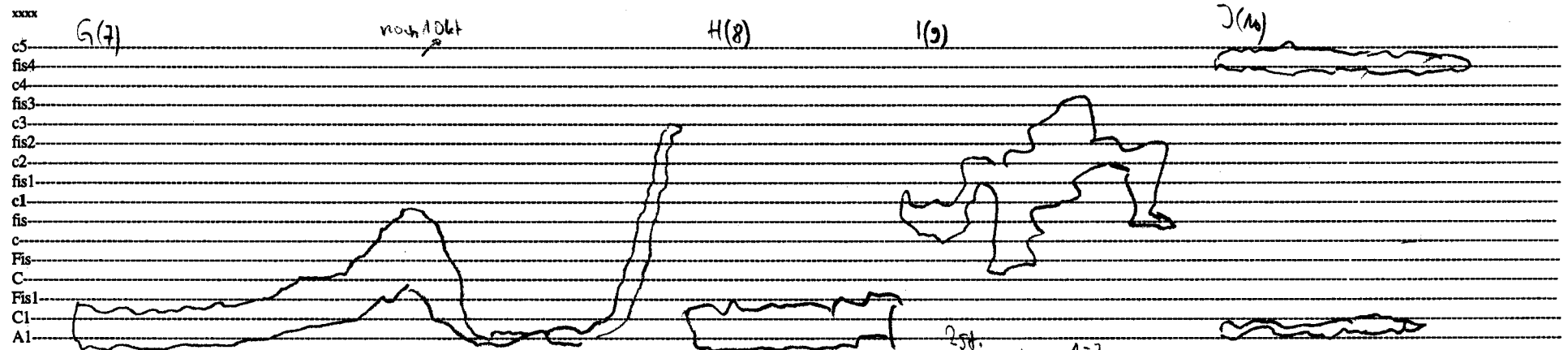
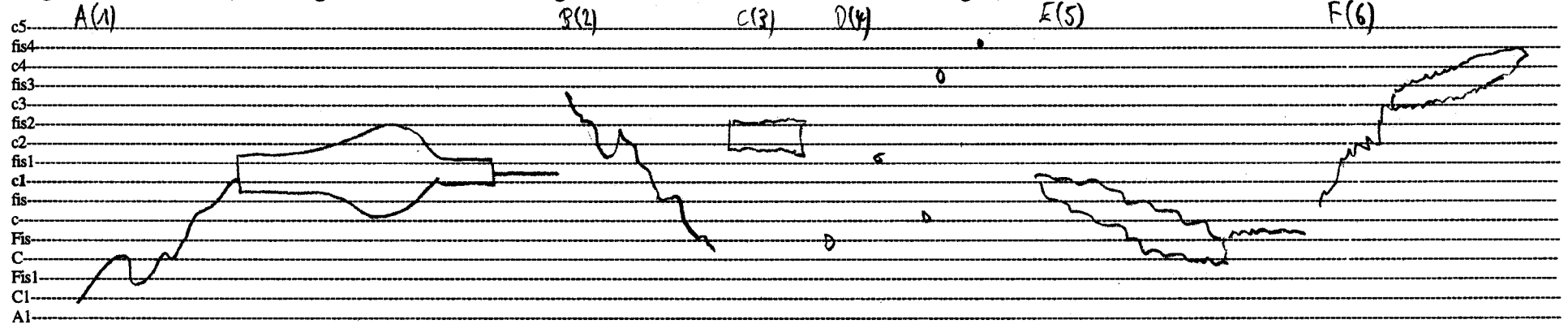


Register - Ambitus (Linien, gemeinsame Bereiche, getrennte Bereiche, Ambitusveränderungen)



Wertintervall

17.12.2001

System der Oktavlagen:

r.H.: (1) 2-1-2-3-2-3-4-3-4-3-2-3-2-1 :|| 2x durch

l.H.: (1) kl-1-kl-gr-kl-gr-ko-gr-ko-gr-kl-gr-kl-1 :|| 2x durch

Umfänge in den verschiedenen Oktavlagen:

r.H.: 1: a-as1, 2: b1-a2, 3: h2-b3, 4: c4-h4.

l.H.: 1: e-es1, kl: G-fis, gr: B1-A, ko: C1-H1.

Ende Dg. verq.
kontr.

?
~~5 8 10 8 6 0 8 10 10 3 7 8 8 5 7 8 6 4 0 5 8 10 5 2 5 3 6 7 10 5 3 8 4 9 8 7 12 8 5 8~~
~~4 8 10 7 7 6 6 6 8 8 4 1 8 4 8 10 2 6 0 8 5 4 2 8 5 10 9 1 4 8 4 10 10 7 8 4 7 1 0 8~~
0 7 4 6 0 2 6 2 6 5 5 7 5 4 6 2 7 8 10 8 6 5 4 5 7 9 4 1 4 1 6 4 6 3 8 8 10 8 3 7 10
1 9 8 1 2 7 1 7 9 1 3 0 0 4 6 5 3 10 0 7 4 3 10 1 7 1 4 3 0 2 3 9 4 1 2 6 9 9 2 5 5 1
6 6 7 5 7 7 8 9 2 2 3 5 8 6 8 4 7 10 7 5 6 9 8 4 7 10 9 0 6 8 1 4 7 4 9 1 5 1 9 2 3 8
2 4 3 9 5 6 0 7 7 5 1 9 1 0 5 0 3 8 0 8 7 1 10 5 7 8 3 2 6 5 5 3 8 7 8 1 6 9 9 6 4 10
3 6 7 6 6 6 0 1 4 6 7 9 2 3 3 1 6 2 0 8 9 7 8 8 7 0 9 9 1 5 9 4 0 7 4 0 5 5 6 4 8 9 0
6 7 1 6 7 1 5 1 10 3 0 6 3 6 8 0 2 9 10 3 9 10 8 10 8 7 1 0 3 3 1 9 1 3 0 9 10 7 1 9 6
8 7 0 8 10 0 9 1 2 0 8 4 0 1 5 8 4 5 6 1 9 10 7 6 6 5 1 9 3 2 2 0 9 10 10 0 9 7 10 4
1 8 9 2 9 9 10 1 9 0 6 3 0 7 10 5 5 6 8 9 1 7 9 7 0 1 0 5 6 2 8 2 4 0 5 5 8 4 9 7 5 0
8 4 2 9 1 8 7 5 5 2 6 6 9 3 4 0 8 9 9 1 10 1 5 9 7 2 6 9 6 9 7 0 9 8 1 0 2 4 7 7 2 3 2
6 2 10 9 8 0 8 6 2 1 8 7 3 5 5 9 0 0 6 7 2 3 10 10 6 8 5 1 5 3 4 7 3 0 10 8 5 5 9 10
1 0 9)
?

0 1 2 3 4 5 6 7 8 9 10 11
c a n d a e f f i s z a b h

Klavierstück 2001/2002

Algorithm. 2

Phrasenlängen:

```
(loop for x in (loop repeat 80
  collect (between 2 32))
  when (evenp x)
  collect x)
```

Resultat:

(2/8/6/6/18/14/16/22/18/22/6/10/18 6 20 14 22 20 8 2 2 18 26 22
 6 16 26 22 4 16 24 14 12 4 2 24 10 24)
 (16 14 12 24 4 10 4 30 28 6 12 28 28 16 24 20 16 8 30 20 10
 28 30 6 8 4 14 26 14 16 30 18 12 4 2 12 6 8 24 18 16 20 6 18)
 (2 14 8 2 20 16 18 20 4 18 26 12 2 18 6 8 6 16 30 6 6 18 22 26 10 12 24 6 26 30 2 10 8 4 :

Töne: entweder kurzzeitig oder ganz lang

```
(loop repeat 1000
  with list = '(c cis d es e f fis g as a b h x)
  with list-length = (1- (length list))
  for random-index = (random list-length)
  for random-element = (nth random-index list)
  collect random-element)
```

Resultat: *Random-lyste für Klavierstück A-2 (1-10), T. 3-27*
 (E B/H H D ~~ES~~ CIS G ~~F~~ A C H ES/C A ES CIS H AS/B F E B C
~~CIS~~/FIS F FIS G H A G FIS F C G F FIS E D ES AS B/~~B~~ H AS
 FIS F CIS ES G H ~~H~~ CIS C E CIS ~~X~~ C H/H G ~~D~~ ES F D C A ~~F~~ FIS
~~D~~ H E ~~F~~ FIS G CIS C ~~E~~ ES F ~~F~~ CIS/~~AS~~ AS FIS FIS C A C ~~F~~ A E
~~A~~ B AS FIS ~~B~~ H C B F CIS B H ES B H E D FIS ~~C~~ B D H A AS ~~AS~~
 F E F A ES A H AS B E D G AS/D B ES C D CIS C F E C ES D ES
 AS B E H C AS C ~~X~~ FIS CIS/C H F A F CIS/D G E B A B ES D FIS
 B/~~B~~ H CIS G CIS FIS G B ~~B~~ A G F G AS/C E B A ES FIS ES G CIS
 FIS ~~X~~ G CIS FIS CIS FIS ~~ES~~ D ~~X~~ CIS CIS B ~~ES~~ CIS CIS D E ES
 FIS ~~X~~ C B G CIS G H ES E ES FIS ~~B~~ AS E B ~~B~~ E H A D ~~F~~ FIS ~~D~~ ~~F~~
 B E A B FIS A B C/A AS/(C)G ~~ES~~ AS G H G CIS A (C)D CIS AS C'H/
 A H F ~~F~~ C B H C G FIS E ~~AS~~ ~~AS~~ CIS H ~~CIS~~ E FIS C B CIS E ~~E~~ G
 D FIS AS/FIS G H ~~H~~ G B/C E ~~E~~ C FIS F B E ES H B ES A ~~F~~ AS H
 C (E)H G ES E CIS H B/~~B~~ G ~~E~~ ~~E~~ ~~E~~ AS C FIS B CIS ~~B~~ D B ~~E~~ E FIS
 A C FIS ES ~~A~~ A ES E H B C B AS D H AS B F G D ~~D~~ C E CIS ES E
 CIS D G AS A D ~~ES~~ ~~F~~ ~~F~~ AS CIS AS ~~X~~ B H C CIS AS ~~X~~ H B CIS E
 CIS ~~X~~ C AS A ES AS F ~~E~~ ~~E~~ ~~E~~ G AS C A ~~F~~ CIS ~~F~~ ~~ES~~ F FIS F A CIS
 H B CIS ~~CIS~~ AS H D ~~X~~ CIS C ~~E~~ F H B A H C F D AS B ES CIS H ES
 CIS E ES H ES ~~ES~~ CIS B C E ~~X~~ AS C//~~E~~ E B E A ~~E~~ D ES AS B CIS
 CIS AS A ES B CIS ES ~~ES~~ AS CIS ES//E ~~E~~ ~~A~~ H C FIS CIS D F ES A
 C G ~~ES~~ H FIS C H C B C D F H A H B AS C D A ES D AS ES F B A
 F ~~F~~ H C H ~~H~~ E ~~AS~~ CIS ~~CIS~~ ES CIS G C H B D B ~~F~~ AS F B H ~~X~~ CIS/
 H A AS/ES FIS AS F G ES/~~E~~ A AS C H E F H E H FIS ~~ES~~ A G B G
 AS C/~~F~~ ~~ES~~ FIS ES FIS A B AS F ES H E F C F C G ~~E~~ B F AS ~~CIS~~
 FIS F ES F D/FIS ~~X~~ CIS FIS ~~X~~ G AS ~~AS~~ A E H E C F ~~AS~~ G AS E D
 E B H AS ~~AS~~ F ~~F~~ FIS A H E F CIS ~~B~~ H B G CIS G H AS CIS/AS C
 E F ~~X~~ CIS C CIS ES D H B A H D ~~ES~~ ~~B~~ B CIS ~~CIS~~ AS ~~X~~ H/~~ES~~ ~~X~~ ~~E~~
 G ES ~~E~~ D C ~~E~~ ~~E~~ E ES G E FIS G/FIS ES ~~ES~~ E CIS H E FIS G FIS
 H B C B AS H G H F ~~F~~ CIS C H G H FIS H ~~ES~~ CIS C ~~E~~ A FIS E D
 CIS ES AS A D ~~ES~~ AS C B AS E G ~~X~~ F ES F AS G A H ES ~~AS~~ ~~ES~~
~~ES~~ H C D C FIS AS E D AS G CIS ES CIS E ~~AS~~ CIS B A CIS C ~~E~~ E
 CIS ~~AS~~ F ~~B~~ H F AS FIS E CIS C H G/F/FIS ~~F~~ AS A B H AS ~~AS~~ ~~AS~~/
 CIS ~~F~~ H CIS ~~CIS~~ G ES ~~ES~~ G CIS D F G FIS/~~ES~~ D CIS B ~~B~~ E G ~~E~~
 FIS ES ~~ES~~ F FIS H C B G F ES C D ES F D CIS D B CIS ~~CIS~~ G H
~~X~~ A E F ~~F~~ D G/A ES C B F AS ~~CIS~~ ~~CIS~~ E AS F B G FIS F E AS ES E
 C ~~X~~ H FIS B ~~F~~ F H ES ~~ES~~ FIS A D AS D G ~~E~~ D FIS G D CIS E D H
~~ES~~ ES A B E A AS CIS ~~CIS~~ ~~F~~ ~~F~~ FIS ~~B~~ ~~B~~ ES E H ES ~~ES~~ B H CIS
 B ES ~~ES~~ ~~ES~~ ~~E~~ F AS ~~CIS~~ H/~~ES~~ ~~ES~~ ~~ES~~ C A ~~X~~ CIS ~~X~~ C FIS CIS ES E
 C ES FIS CIS G ES FIS A ~~A~~ E ~~X~~ FIS F A ~~E~~ E A F A FIS E H B ES

Rehmet, kann verändert werden

→ A

*anfang
Einschub T. 12 //*

~~ES~~ E ES G D A C ~~/~~ CIS E G AS A H E ~~AS~~ ES E B ~~D~~ CIS B C H AS
FIS AS ES B ES D/FIS F B ~~CIS~~ ~~CIS~~ ES H ~~AS~~ E H A CIS G CIS ~~CIS~~
~~CIS~~ ~~CIS~~ ES C F CIS A AS ~~AS~~ F G F B ~~CIS~~ AS ES A) ✓,

Klavierstück 2001/2002

Phrasenlängen:

```
(loop for x in (loop repeat 80
               collect (between 2 32))
      when (evenp x)
        collect x)
```

Resultat:

(2 8 6 6 18 14 16 22 18 22 6 10 18 6 20 14 22 20 8 2 2 18 26 22
 6 16 26 22 4 16 24 14 12 4 2 24 10 24)
 (16 14 12 24 4 10 4 30 28 6 12 28 28 16 24 20 16 8 30 20 10
 28 30 6 8 4 14 26 14 16 30 18 12 4 2 12 6 8 24 18 16 20 6 18)
 (2 14 8 2 20 16 18 20 4 18 26 12 2 18 6 8 6 16 30 6 6 18 22 26 10 12 24 6 26 30 2 10 8 4 :

;;;;;;;;;;

Kurzphrasenlängen, gerade:

```
(loop for x in (loop repeat 80
               collect (between 2 10))
      when (evenp x)
        collect x)
```

Resultat:

(2 2 6 4 2 4 8 6/4 4 4 6 4 4 2/8 4 2 6 6 2 4 6 8 2 4 8 6 8
 2 6 2 8 2 8 6 6 6 2 8 6 8 2 4 8)

→Praktisch

ev. einige der 2er Schleif, vorher nach Kompositionen: non-stop
 32 Töne zw. Fis¹-H¹
 18 " " C¹-F¹

T₀

;;;;;;;;;;

Kurzphrasenlängen, ungerade:

```
(loop for x in (loop repeat 80
               collect (between 1 8))
      when (oddp x)
        collect x)
```

Resultat:

(3 7 5 3 5 3 3 | 1 | 3 3 7 1 7 5 1 3 7 7 1 3 3 5 7 5 7 3 3 5 7 1
 5 7 5 5 1 7 1 5 5 5 5 5)

;;;;;;;;;;

Töne:

```
(loop repeat 1000
  with list = '(c cis d es e f fis g as a b h x)
  with list-length = (1- (length list))
  for random-index = (random list-length)
  for random-element = (nth random-index list)
  collect random-element)
```

Resultat:

(E B H H D FIS CIS G G F A C H ES C A ES CIS H AS B F E B C
 C CIS FIS F FIS G H A G FIS F C G F FIS E D ES AS B B H AS
 FIS F CIS ES G H H CIS C E CIS A C H H G D ES F D C A F FIS
 D H E E E FIS G CIS C C ES F F CIS AS AS FIS FIS C A C F A E
 A B AS FIS B H C B F CIS B H ES B H E D FIS E B D H A AS AS
 F E F A ES A H AS B E D G AS D B ES C D CIS C F E C ES D ES
 AS B E H C AS C F FIS CIS C H F A F CIS D G E B A B ES D FIS
 B B H CIS G CIS FIS G B B A G F G AS C E B A ES FIS ES G CIS
 FIS A G CIS FIS CIS FIS FIS D A CIS CIS B FIS CIS CIS D E ES
 FIS B C B G CIS G H ES E ES FIS B AS E B B E H A D F FIS D F
 B E A B FIS A B C A AS C G ES AS G H G CIS A C D CIS AS C H
 A H F F C B H C G FIS E AS AS CIS H CIS E FIS C B CIS E E G
 D FIS AS FIS G H H G B C E G G C FIS F B E ES H B ES A AS H

Klavierstück 2001/2002 (2)

Phrasenlängen für Hüllkurvenblock K.

```
(loop repeat 80
  collect (between 3 19))
```

Resultat:

```
(7 14 17 9 15 6 4 12 7 10 18 15 9 15 7 17 9 6 4 5 10 7 17
3 5 3 9 11 11 8 8 13 13 18 11 7 15 14 3 18 9 9 11 15 17 4
16 13 13 7 8 18 10 5 3 7 10 9 12 11 4 9 16 11 12 14 13 14
7 11 15 14 13 4 6 9 15 5 10 17)
```

Tonhöhenmatrix f. T. 27-

(aus Dreiklang-Filter)

(10 6 9 9 6 8/1 0 7 5 5 7 0 6 10 5 8 2 3 4 5 2 2 0 2 6 7 6 3 7 9 2 10 0 7 10 8 2 7 4 2
 4 6 2 1 5 11 3 9 1 9 7/1 6 6 10 2 4 1 3 4 0 10 10 5 3 4 7 2//0 7 2 0 5 5 5 11 [0 11] 6 1
 5 0 0 6 4 6 10 2 6 7 1 6 [5] 9 11 6 4 1 0 1 2 8 8 1 3 5 5 4 8 8 9/5 3 6 7 3 1 8 3 3 1 8
 9 10 10 0 9 3 0 6/2 8 6 9 10 7 8/3 8 3 3 6 9 11/7 9 4 2 5/2 8 8 11 0 1 2 1 2 5 [7 4 5
 1 5 2 3 1 2/9 11 10 8 10 6 9 7 5 4 2 1 0//4 6 4 10 11 9 10 9 11 7 1 11 8 9 7 1 9 5 8 2
 0 6 4 9 2 1 5 9 9 7 5 6 7 11 6 5 8 4 0 0 11 7/6 3 0 1 2 2 11 3 7 8 0 0 6 2 2 6 10 5 10
 10 10 10 1 7 8 4 4 2 8 10 5 6 7 1 3 4 1 10 1 7 2 4 5 3 1 11 11 2 4 8 4 4 8 2 5 4 9 8
 0 7 2 1 5 2 6//0 6 2 0 11 5 6 1 5 7 4 1 6 8 3 7 4 5 2 6 6 0 0 10 2 3 1 9 0 1 11 5 11 8
 5 7 1 7 8 0 10 6 9 6 11 1 3 4 11 11 7 8 11 10 9 4 4 9 4 5/0 10 2 1 6 8 1 7 6 6 8 7 11
 8 1 3 1 1 9 10 3 5 4 1 11 11 6 11 8 9 7 8 2 7 9/1 7 6 1 0 9 6 0 7 1 9 0 3 3 6 8 1 2 9
 2 9 3 4 1 11 9 5 11 2 2 3 8 4 4 11 11 0 10 7 9 10 11 8 6 7 1 4 2 0 1 3 0 1 2 3 2 0 2 2
 7 4 9 7 8 1 8 7 5 6/4 9 6 3 8 10 6 0 2 4 10 8 4 0 4 10 2 2 2 6 5 10 9 4 5 6 1 11 7 0
 9 2 4/11 5 2 2 1 8 11 5 1//11 2 1 7 5 10 8 9 2 3 1 0 8 2 3 4 8 2 2 3 8 7 3 4 5 11 11 3
 5 5 5 0 5 11 10 11 8 1 7 10 6 9 3 6 7 7 10 9 8 1 9 5 3 8 3 7 7 4 6 11 4 6 1 8 6 2 8 4
 9 8 11 2 10 9 11 1 2 9 7 3 6 6 0 6 0 9 2 9 0 6 3 6 1 11 2//3 9 8 1 0 6 9 5 9 4 3 7 3 7
 3 9 5 5 4 1 10 0 9 8 1 9 1 7 0 10 3 4 4 10 0 3 11 11 9 0 10 11 9 5 11 9 10 6 8 2 0 10
 11 10 10 10 2 11 2 1 1 3 0 5 3 8 8 6 9 6 7 5 11 0 2 7 0 10 2 4 11 9 11 7 5 8 7//4 3 6 0
 0 4 11 1 0 2 5 7 3 2 5 0 6//8/9 5 1 0 6 10 10 2 3 1 11 3 1 10 10 4 7 3 7 4 9 5 3 8 5//7
 7 3 1 9 5 3 10 3 0 2 8 3 2 2 1 9 1 7 5 5 3 7 6 9 11 3 10 11 3 3 2 4 0 1 4 10 11 5 0//2
 10 9 8 3 7 6 6 5 3 11 0 4 2 0 7 7 9 9 1 3 11 3 2 10 11 11 4 3 11 9 4 5 3 9 2 2 2 9 8
 3 3/9 2 3 3 5 1 4 11 11 3 1 4 5 3 7 3 8 7 5 11 4 0 1 1 7 0 11 8 8 6 8 4 2 7 8 3 2 11 9
 8 6 2 4 3/3 8 5 6 6 8 9 1 3 4 11 6 0 3 10 8 1 6 2 6 8 11 0 2/11 10 9 8 11 0 2 4 4 11
 4 11 6 0 6 11 10 10 8 0 10 8 0 4 4/2 9 1 5 3 9 11 3 2 10 0 6 2 5 6 7 1 4 10 3 8 4 4 9
 11 11/4 2 4 1 4 5 5 9 1 7 3 6 7 11 9 7 11 5 1 11 6 8 7 1 11 2 8 5 2 11 9 4 9 11 8 1 3
 3 3 5 1 5 5 11 1 0/11 5 8 6 10 8 9 1 1 11 6 8 4 3 0 9 10 6 0 8 4 3 5 4/6 8 7 4 9 7 5 2
 8 2/0 8 6 4 7 4 3 6 8 5 6 3 3 9 11 8 6 4 5 1 3 9 3 8 10 5 7 5 8 8 9 1 5 0//3 1 1 1 1 7
 1 9 11 4 11 3 10 5 6 2 3 10 3 8 6 8 11//0 10 1 10 10 4 3 4 11 9 8 7 4 1 0 0 9 2 7 3 4
 3 3 10 11 4 6 9 5 9 4 9 5 6 4 4 9 9 6 3 7 1 6 3 0 4 3 1 6 0 1 9 9 0 11 8 5 7 3 3 3 10
 1 11 10 3 3 11 4 3 10 10 6 5 4 5 1 1 8 9 4 10 9 3 11 2 4 1 2 7 6 2 7 7 2 8 9 6 3 3 11
 5 10 10 6 11 0 4 3 8 4 5 6 7 10 5 8 4 8 5 2 3 9 7 2 5 5 4 9 11 7 1 1 10 2 1 2 5 3 2 0//
 3 5 7 10 0 11 6 5 3 3 6 7 4 10 10 1 2 6 6 7 5 2 1 7 3 3 7 1 1 11 1 8 8 8 11 10 9 6 6 5//
 7 11 0 1 4 6 8 5 11 5 1 4 0 0 1 9 10 1 4 1 3 1 7 8 2 4 8 6 0 2 0 11 3 3 3 11 9 7 8 5
 3 5 7 4 8 10 0 8 2 9 8 3 1 2 4 6 9 0 0 1 11 6 11 7 11 0 1 5 5 11 7 11 8//10 0 10 11 6 7//
 6 4 11 1 4 3 3 6 7 6 4 7 3 4 0 0 0 2 0 3 4 11 11 8 1 1 10 2 2 11 9 10 11 2 3 1 0 1 5
 5 4 0 8 1 8 11 7 1 7 10 11 1 5 4 11 9 6 5 5 8 8 11 10 4 2 4 8 7 5 0 4 11 4 9 8 8 7 6 1
 6 2 5 3 5 6 8 5 10 7 0//5 0 5 4 11 3 5 8 10 9 6 3 6 0 8,7 10 7 9 6 11 4 11,5 4 11 0 8
 9 3 7,5 8 6 3 8 9 11 1,1 11 11 10 5 8 10 2 10,11 0 7 1 3 1 1 4,11 11 0 11 5 5 9 10,5 3 8
 | 2 3 9 2 0,8 10 11 9 11 5 2 0,10 0 11 0 6 11 7 0,9 3 5 2 1 6 0 11//9 4 3 1/8 3 3 1 10
 3 9 8 1 1 10 8/3 2 9 4 10/4 0 0 8 4 0 10 1 3 3 11 3 4 1 3 11 1 3 10 8 2 5 0 11 9 10 1
 1 5 0 0 1 2//11 8 1 1 10 11 1 9 5 6 5 1 9 0 8//7 5 8 3 9 8 0 1 4 1 10 11 8 1 0/11 10 8 1
 8 2 9 8 7 2 1 4 3 1 4 0 2 2 7 5 10 8 11 2 8 10 0 10 11 4 3 9 3 6 0 9 6 4 10 2 10 10 6
 0 8 2//7 7 7 7 10 10 11 1 4 3 7 11 10 0 11 8 9 3 10 11 3 4 10 5 6 0 4 0 10 7 11 11 7 6
 8 6 2 7 4 4 1 10 0 6 4 1 11 1 8 8 4 6 7 0 11 10 0 5 5 11 9 11 0 8 1 2 0 9 1 7 11 7 8
 7 0 8 9 0 10 9 6 10 9 4 5 2 2 9 11 4 10 10 4 8 6 3 4 3 11 7 1 7 10 0//6 3 4 2 1 1 10 1
 1 2/6 6 1 6 1 7 6 1 7 3 6 3 9 10 4 0 8 7 5 7 9 10 10 7 6 1 7 1 11 10 10 6 2 3 10 9 10
 4 7 2 1 5 9 5 11 0 1 6 0 8 0 11 4 10 8 3 2 3 0 4 5 0 1 2 0 3 10 2 8 7 2 4 10 8 11 9 3
 9 5 4 5 8 8 9 11 2 10 4 6 2 4 11 10 3 11 10 5 10 0 11 10 6 8 10 9 9 0 9 0 6 6 1//5 5 3
 0 0 1 7 6 4 4 4 11//6 9 0/2 5 3 7 11 11/0 1 4 0 1//11 11 7 3 1 5 6 8 11 10 10 8 3 2 4 6
 5 7 0 5 6 7 9 11//7 6 5 6 1 0 0 10 4 5 10/8 11 1 3 9 0 3 11 9 5 7 7 1 2 11 11 10 4 11 1/
 1 4 2 11 10 4 6 8 7 5 3 2 6 10 10 8 0 7 9 2 11 11 3 0 6 4 6 0 10 11 11 4 5 5 7 8 2 11
 9 2 11 2 3 7 1 0 7 8 11 8 7 10 5 3 1 1 10 1 9 0 0)//
 ?

21V T.54
 41V 3'
 39V
 40V
 40V
 40V
 37V
 40V
 11V
 Einschub
 T.45-52
 10
 Einschub
 T.60-62
 T.83

HD:Dateien/usr:CM-Dateien:CM 2.1-Beispiele:Lisp-Übungen:Klavierstück 01/02
(in CM-2.3.1)

```
(setf x (new heap 2 3 4 5 6 7 8 9 10 11 12 13))
```

```
  Aufruf: (next x 12)
```

```
Resultate:
```

```
(12 13 9 6 8 5 11 2 7 10 4 3)
```

```
(7 11 12 4 10 13 3 5 6 8 9 2)
```

```
(5 11 9 13 10 4 7 3 6 2 12 8)
```

```
(setf x (new heap 1 2 3 4 5 6 7))
```

```
  Aufruf: (next x 12)
```

```
Resultate:
```

```
(5 6 3 1 7 2 4 6 4 5 1 2)
```

```
(7 3 5 2 7 1 3 4 6 3 6 7)
```

```
(2 5 4 1 2 5 6 1 4 3 7 1)
```

HD G3:Dateien/usr:CM-Dateien:CM 2.1-Beispiele:Lisp-Übungen:Dreiklang-Filter Antiberg

ANTIBERG 10000

T.86 Oberst. T.83 nach Hausa 85 T.84

PT:ZA

(9 1 10 4 9 2 11 5 2 7 2 8 2/5 1 2 4 3 2 8 6/8 0/4 3 8 9 7 5 5 0 6 8 11/11) 8 1 8 1 0 0
 9 2 8 10 9 4 3 9 9 9 11 6 1 2 2 7 7 2 1 4 7 10 10 2 3 0 0 10 6 9 9 4 11/6 6 3 5 1 9 9
 8 3 7 8 2 7 9 4 11 2 0 7 7 11 11 7 1 9 3 2 5 0 10 6 0 4 6 6 10 7 8 6 2 4 (2 5 5 9) 3 5
 3 0 11 8 11 0 7 11 10 4 6 8 6 2 10/3 11 7 8 3 3 5 0 1 7 1 1 2 0 4 6 9 11 7 11 10 10 8
 6 1 7 4 3 9 5 3 9 1 5 11 11 0 2 9 4 8 6 1 0 5 3 1 11 10 0 7 11 10 8 1 8 10 0 6 3 7 8 1
 (8 8 8 5) 2 1 4 2 9 9 3 3 3 5 10 4 7 2 2 3 11 5 9 1 7 8 9 3 6 9 8 1 10 11 11 4 3 10 2
 0 9 8 1 8 1 7 1 9 3 8 9 5 8 10 6 7 10 4 6 5 2 2 4 3 9 3 11 7 9 5 3 5 7 5 4 7 7 11 3 1
 1 10 4 7 5 7 1 2 1 1 4 3 0 0 2 10 4 7 6 9 0 3 10 (3 0 0 8) 10 0 8 6 11 6 4 11 9 7 11 8 0 9
 2 9 11 2 0 1 0 4 2 7 1 1 4 3 0 11 0 3 4 0 2 5 1 1 10 0 10 9 2 2 1 7 6 7 4 6 11 5 0 10
 0 11 0 10 1 8 9 4 11 0 8 0 11 3 10 11 3 3 10 9 8 8 5 7 3 8 9 1 0 8 7 8 6 4 3 10 11 9
 9 1 11 4 1 5 2 8 11 2 8 8 8 1 9 0 2 2 8 10 3 10 11 1 5 9 6 0 4 2 0 6 4 0 11 9 7 5 7 8
 0 8 11 1 2 10 11 6 7 9 7 8 1 3 4 6 1 8 7 5 11 7 10 9 9 9 0 7 2 4 2 4 9 5 3 9 0 10 1 9
 8 3 6 3 9 6 4 9 10 2 4 0 10 1 10 0 1 1 8 7 11 8 9 0 11 11 10 4 5 11 4 10 11 0 6 11 6 1
 1 0 4 1 6 2 10 6 10 0 3 3 10 8 7 4 5 9 9 0 1 0 5 7 8 11 6 8 3 10 11 10 8 5 3 10 8
 3 1 10 8 9 8 5 2 11 0 7 2 8 3 4 1 11 3 7 2 0 3 6 7 6 1 0 6 5 6 0 3 2 4 3 3 0 11 0 1 9
 2 0 4 8 5 4 6 9 6 0 7 8 4 0 5 3 11 9 8 11 0 4 11 5 0 10 0 3 2 5 3 6 8 4 5 5 5 8 5 5 1
 1 8 11 5 6 9 0 9 9 3 9 4 6 10 10 6 4 4 2 9 4 2 11 9 11 11 8 2 9 2 9 1 3 4 6 10 8 2 10
 1 2 7 6 1 1 11 6 8 11 2 4 1 4 0 2 6 10 8 10 10 7 0 10 11 1 1 1 0 6 7 4 7 10 9 2 10 9 8
 3 3 1 1 11 5 5 5 2 3 8 8 5 5 3 10 10 8 10 1 9 5 5 2 7 0 9 10 8 0 9 11 11 0 4 8 5 6 4
 3 6 0 0 7 7 7 1 5 2 0 8 1 0 7 9 2 1 1 8 9 4 8 0 11 5 2 4 5 2 6 8 1 9 5 3 0 11 5 11 4 1
 1 5 6 9 5 10 6 6 5 4 3 11 3 3 9 0 6 11 8 7 5 8 4 4 11 6 0 3 0 11 6 10 6 10 0 10 10 1 2
 7 5 7 5 4 5 10 6 11 10 11 0 3 4 2 11 2 11 4 1 2 3 0 5 2 3 4 7 3 9 9 2 1 0 4 5 0 2 5 8
 11 1 5 7 3 7 7 3 8 3 5 4 5 0 5 2 3 10 10 2 3 6 6 11 11 1 2 0 2 1 11 0 7 9 3 8 8 5 5 4
 9 8 10 10 5 3 6 4 8 7 9 5 1 11 9 3 7 9 8 11 1 1 7 7 8 5 4 7 1 8 9 11 11 7 7 2 1 6 4
 8 0 8 4 10 9 8 3 10 3 5 9 4 2 9 0 7 5 10 6 11 5 4 7 6 4 5 4 5 6 2 3 3 7 6 2 0 7 11 11
 7 1 11 8 2 6 5 0 1 0 11 7 8 3 2 6 3 4 4 9 6 10 9 9 10 10 5 8 4 6 4 10 8 6 9 4 6 6 7 4
 9 5 10 5 3 5 11 9 0 8 2 11 8 2 5 7 5 7 4 3 2 2 11 10 3 0 9 2 1 8 7 1 7 8 3 8 2 9 11 2
 0 3 4 11 11 5 10 9 3 3 10 4 8 7 8 7 2 8 8 1 0 10 7 10 8 5 6 11 6 8 6 10 0 3 3 9 4 10
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 0 8 1 9 8 11 6 9 6 0 8 6 8 3 5 0 0 4 3 8 2 3 0 5 4 8 9 7 10 8 11 7 6 8 11 10 7 11 8 1
 7 7 4 9 8 0 0 11 1 7 6 11 1 10 8 5 8 10 5 11 4 10 0 7 8 6 7 10 8 5 5 0 3 10 1 1 9 8 10
 3 1 7 10 0 5 3 4 0 1 3 9 10 6 8 6 10 2 0 11 9 11 10 6 5 10 6 0 8 11 6 6 8 1 7 0 0 9 1
 1 9 9 11 10 11 7 0 8 8 10 1 2 11 0 4 11 10 3 4 1 2 0 6 2 1 2 10 9 9 8 10 1 11 10 3 1 1
 1 7 2 9 9 5 1 5 2 1 7 11 0 0 8 6 4 2 1 2 4 1 4 4 4 11 6 10 8 9 5 11 11 10 1 0 3 6 5 5
 4 2 1 8 6 4 3 3 6 0 0 11 5 10 3 1 5 11 10 6 11 8 9 5 1 5 6 2 3 2 9 4 10 6 9 3 2 10
 8 7 9 2 11 11 0 0 3 6 3 0 9 8 4 0 5 11 1 5 5 8 8 6 7 11 0 9 3 8 8 0 2 2 8 2 0 10 5 8 8
 10 6 8 5 4 10 7 10 9 0 8 9 8 6 0 5 11 10 3 2 9 4 5 7 2 0 4 2 0 7 1 5 7 7 10 6 9 8 11
 6 0 0 6 9 9 8 5 3 2 6 2 5 5 2 8 7 10 0 6 11 5 4 6 10 6 11 9 7 5 1 5 1 4 4 2 4 0 4 3 3
 2 8 7 3 11 4 1 0 5 5 7 2 6 5 11 10 5 3 4 8 4 9 11 9 8 2 1 9 5 3 0 6 0 10 6 10 6 8 9 11
 5 7 8 1 1 0 8 6 6 6 1 0 7 6 5 4 1 3 10 11 9 1 9 10 7 11 10 5 11 7 10 9 7 8 8 3 1 6 11
 8 9 10 7 1 8 3 6 1 2 9 0 3 0 1 10 0 10 7 1 6 1 4 1 3 11 2 4 10 6 11 7 10 8 1 8 11 9 1
 1 1 3 8 10 8 4 3 1 1 2 11 2 2 10 1 4 11 5 5 7 10 7 9 3 7 6 2 4 5 10 8 9 9 3 1 5 9 1 0
 9 2 1 11 3 7 8 6 6 0 11 2 10 10 1 3 11 7 5 5 10 7 6 3 1 7 8 7 5 3 3 3 10 8 4 3 6 4 2 1
 6 2 2 2 4 2 1 9 0 11 10 2 9 11 5 11 7 6 8 2 8 0 0 5 11 2 8 11 1 5 3 1 0 8 2 4 1 10 0
 0 2 7 0 8 10 0 10 7 0 8 6 4 9 10 6 9 11 7 11 3 1 11 9 7 8 5 11 9 0 1 3 6 4 10 0 4 2 9
 1 3 1 3 9 4 9 4 5 10 10 5 9 5 7 6 5 3 10 9 7 0 10 8 3 6 8 2 5 2 5 0 2 2 11 3 9 0 11 8
 0 4 3 5 0 10 2 8 0 10 8 11 5 3 11 0 4 1 2 4 0 3 0 6 3 3 8 7 11 9 1 5 4 3 9 7 3 8 2 1 2
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 0 3 4 2 10 2 10 0 4 4 8 7 11 11 5 10 6 10 10 5 11 0 3 2 7 1 6 6 9 6 9 5 3 7 9 9 3 6 5
 7 1 2 10 9 10 10 2 11 8 10 8 11 10 7 11 9 10 9 6 4 1 0 0 2 2 0 3 4 6 0 1 0 10 5 9 4 4
 1 10 3 1 11 2 11 1 4 10 5 9 9 6 0 8 7 0 2 11 5 6 5 10 8 3 8 4 2 3 3 1 9 9 8 10 6 8 10
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 7 6 8 1 10 4 10 3 11 10 8 6 10 7 5 6 1 3 7 1 6 6 8 8 1 0 11 9 9 1 1 7 8 11 7 7 11 6 1
 1 7 10 8 2 1 5 6 10 4 0 3 10 5 6 2 7 4 3 7 6 2 3 6 0 6 10 4 8 0 1 6 3 7 8 3 8 7 10 9 6
 6 9 8 10 0 10 4 4 9 7 0 10 8 10 3 1 7 6 8 11 8 2 6 4 11 2 2 10 6 7 9 6 8 10 5 7 4 8 3
 9 9 10 2 11 9 8 6 11 7 11 10 10 2 3 5 8 10 7 1 5 4 5 5 3 1 9 5 6 10 5 8 6 2 0 5 1 11
 4 1 10 0 10 1 3 7 3 5 7 4 8 7 3 3 7 11 6 9 3 4 4 5 2 2 8 4 9 3 11 0 2 2 11 9 11 10 7 1
 1 0 5 2 7 5 0 11 4 3 10 11 6 4 1 10 2 2 5 0 5 6 8 7 10 1 0 0 2 9 8 11 2 0 8 1 11 2 2 5
 8 10 3 10 2 9 11 2 4 11 11 3 2 8 5 9 3 7 4 9 3 4 7 7 0 10 10 2 8 0 6 7 4 1 0 8 11 5 1
 0 10 10 10 2 0 3 0 10 11 10 2 8 4 4 8 0 4 11 4 9 5 7 9 2 7 1)

?

Primzahlen-Random

HD G3: Dateien/usr:CM-Dateien:CM 2.1-Beispiele:Lisp-Übungen:
Primzahlen-Random

```
(loop repeat 200
  with list = '(3 5 7 11 13 17 19 23 29 31 37 41 43 47)
  with list-length = (1- (length list))
  for random-index = (random list-length)
  for random-element = (nth random-index list)
  collect (keynum random-element))
```

Resultat:

```
(11 13 17 13 13 17 29 37 23 19 3 31 41 37 17 17 5 29 29 29
41 41 23 13 5 41 11 29 43 41 17 17 13 43 17 11 31 5 7 19 43
3 17 23 37 41 43 17 31 41 23 29 43 37 41 3 31 23 43 37 17
37 29 7 19 23 29 41 29 3 41 31 31 3 31 17 3 23 41 17 7 31
13 17 3 31 19 23 3 41 5 5 23 19 37 5 23 13 19 19 5 43 5 23
11 29 29 37 43 11 11 19 23 19 37 37 43 29 37 37 17 31 13
19 41 7 23 17 41 31 41 3 19 11 13 29 31 43 29 5 13 5 31 13
31 5 23 17 11 37 31 17 7 23 17 13 37 37 7 7 5 13 37 3 43 31
31 5 3 11 37 11 31 3 3 7 31 11 11 23 19 17 13 3 3 19 31 3 5
5 3 7 13 41 37 29 41 37 7 43)
```

? Im Listener speichern!

**G3:Dateien/usr:CM-Dateien:CM 2.1-Beispiele:Lisp-Übungen:
Dreiklang-Filter Antiberg**

**Dateien/usr:CM-Dateien:CM 2.1-Beispiele:Lisp-Übungen:
Dreiklang-Filter Antiberg**

```
(defun antiberg (ints length)
  (loop with l = (list (random 12) (random 12))
    until (= (length l) length)
    for n = (random 12)
    for n-1 = (car l)
    for n-2 = (cadr l)
    unless (equal ints
      (sort
        (list
          (min (mod (- n-2 n-1) 12)
            (- 12 (mod (- n-2 n-1) 12)))
          (min (mod (- n-1 n) 12)
            (- 12 (mod (- n-1 n) 12)))
          (min (mod (- n-2 n) 12)
            (- 12 (mod (- n-2 n) 12))))
        #'<=))
    do (push n l)
    finally (return l)))
```

(antiberg '(3 4 5) 5000)
ANTIBERG

Unterst.

?
 (7 7 9 7 6 2 10 8 0 7 1 0 8 6 5 10 8 7 4 3 3 5 3 1 4 2 7 2 9 11 7 9 3 2 5 4 0 0 3 1 6 *Beispiel 83*
 11 10 11 3 4 7 4 5 2 5 4 4 6 1 0 8 2 9 1 9 3 1 6 7 10 8 2 0 7 5 6 10 8 3 6 2 8 9 1 9 3
 11 10 9 5 10 6 4 9 10 10 1 2 2 5 3 7 7 8 0 10 7 0 9 11 8 0 6 5 11 7 3 3 9 11 0 15 11 5 *T.84*
 7 1 6 11 7 11 7 0 8 11 7 3 5 2 6 7 11 5 9 9 11 2 2 4 0 1 9 7 1 2 9 9 5 10 3 4 8 3 10
 3 9 1 10 4 9 3 2 8 9 7 4 3 7 9 9 10 7 8 7 1 6 4 0 10 0 0 6 6 2 4 7 4 2 0 4 2 8 10 6
 11 4 10 2 3 0 3 4 7 5 4 3 1 1 9 7 1 3 10 2 0 11 1 3 8 7 5 1 6 7 11 6 6 3 0 5 5 9 10 9
 1 0 9 9 10 2 8 8 7 9 7 5 0 5 7 2 6 2 3 10 11 8 0 9 9 3 0 4 10 7 0 6 8 4 10 4 0 5 5 3 5
 3 10 9 8 7 9 5 3 11 4 5 4 9 5 9 1 7 2 6 7 10 6 9 11 2 3 10 9 9 6 9 11 1 8 8 2 8 3 2 2
 4 3 6 4 0 3 9 4 10 5 8 7 8 8 8 2 7 0 7 2 3 1 7 3 4 1 7 11 0 3 3 6 8 5 10 3 10 1 1 0 6
 2 8 5 4 10 11 4 5 2 4 4 2 2 5 3 6 8 10 6 11 9 7 0 11 2 11 11 3 1 3 2 1 4 5 5 3 0 0 8
 11 8 10 9 9 10 8 9 6 10 5 4 9 4 2 11 3 5 7 9 5 3 5 7 11 11 3 9 1 2 8 3 4 0 11 4 5 11 4
 10 3 10 0 6 4 10 5 4 6 7 4 3 10 2 8 7 6 7 1 8 3 6 7 2 9 10 4 11 0 0 0 6 1 6 1 8 11 7
 11 7 10 9 1 2 7 2 3 8 5 9 7 4 10 2 4 3 0 5 1 6 5 3 1 6 1 8 6 6 4 4 1 4 10 8 10 10 4 2
 11 9 6 6 0 7 1 7 6 8 5 11 3 1 11 1 1 4 5 1 6 4 0 1 0 6 0 5 6 9 10 11 1 9 9 10 10 9 5 8
 3 5 6 2 3 10 11 8 10 0 5 0 10 2 9 7 7 8 4 9 9 2 11 8 7 5 10 3 11 7 7 6 1 3 1 2 1 7 2
 9 3 4 7 1 8 9 9 4 11 0 11 7 11 6 10 6 0 4 0 5 11 6 8 3 8 10 10 3 0 10 3 1 11 11 10 8 7
 9 11 9 6 4 0 2 10 3 3 6 1 0 0 6 8 6 3 0 6 5 3 8 3 2 7 7 3 3 8 10 8 3 5 5 7 2 1 9 11 3
 11 7 8 7 2 4 7 8 11 10 1 7 4 2 2 9 3 6 9 5 8 8 11 10 3 2 11 9 8 8 11 8 0 1 3 6 0 2 0
 5 10 9 9 8 3 9 1 8 7 1 10 11 8 7 0 9 11 1 4 1 10 8 7 2 7 8 0 10 1 1 2 6 8 10 10 3 10 1
 9 11 9 2 3 11 0 6 3 0 0 7 8 5 10 7 8 5 10 5 8 9 6 4 8 5 2 6 6 1 6 2 2 10 9 11 11 9 7
 7 10 4 0 2 10 0 5 5 5 6 1 4 2 10 10 0 7 9 8 7 0 6 7 1 8 2 11 8 11 8 5 6 9 0 11 0 1 2 0
 7 5 4 3 10 11 1 0 10 0 9 3 6 3 0 6 2 8 10 1 4 0 4 3 5 1 5 9 4 3 9 7 0 11 10 0 6 7 3 7
 (8 2 9 4 8 2 1 5 5 3 4 10 4 10 3 8 10 8 4 6 5 6 8 10 2 6 6 7 2 2 2 6 2 4 3 8 1 0 10 4)
 6 9 8 7 10 10 5 10 5 3 7 1 5 6 4 5 11 1 5 0 1 1 10 2 3 11 4 2 11 1 10 3 9 10 1 9 11 11
 4 5 4 3 7 1 6 4 5 8 5 8 3 9 4 11 9 7 6 6 11 5 5 0 6 8 3 6 4 0 8 2 5 0 10 10 10 3 9 3
 9 5 1 9 0 10 5 8 10 0 9 6 10 11 8 7 7 10 5 10 5 3 8 1 6 8 5 3 1 11 6 8 10 10 6 10 8 4
 5 11 5 2 7 6 5 1 7 9 3 7 9 0 9 8 3 5 3 10 9 6 4 0 0 7 2 5 1 5 1 5 7 3 7 5 2 8 11 6 10
 5 6 5 9 3 11 5 2 3 6 0 9 0 7 0 11 7 9 8 2 4 1 5 0 6 0 9 11 2 10 6 6 0 2 11 9 1 0 9 1 5
 7 5 7 0 5 3 6 3 9 1 5 3 2 11 4 9 8 3 8 5 3 0 11 9 1 10 0 2 11 10 5 0 0 0 8 8 4 7 10 9
 7 4 5 8 9 11 5 1 0 4 8 5 10 3 8 9 1 5 3 8 3 3 9 1 1 7 7 8 2 1 3 1 2 11 4 0 4 4 9 3 8
 1 6 0 5 2 2 5 7 7 4 7 8 1 6 3 6 8 2 5 6 5 9 11 11 1 6 11 11 4 2 7 9 1 10 11 0 3 9 2 7
 1 3 7 2 9 0 0 9 0 2 0 0 5 4 8 4 3 0 3 3 7 8 2 11 2 11 3 2 8 1 0 11 6 11 11 10 11 10
 0 0 7 0 10 5 5 3 10 0 1 9 1 1 7 8 4 7 1 4 10 5 9 5 1 7 6 0 8 1 7 8 7 0 0 11 3 2 9 2 3
 6 1 5 2 1 7 5 0 7 8 1 6 1 7 10 4 8 5 9 3 6 8 4 10 1 3 4 0 0 9 6 10 7 8 11 10 0 4 3 3 1

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1 5 8 9 6 3 1 3 3 4 0/10 4 6 4 3 8 2 11 10 5 5 2 3 8 7 2 1 3 7 9 2 7 3 5 7 4 8 7 3 9 2
8 10 1 10 4 1 11 4 5 7 2 1 8 2 4 6 3 9 2 3 9 5 6 9 10 5 10 11 8 9 7 11 0//8 2 11 8 11
0/6 1 6 0//8 6 11 11 5 2 7 4 1 6 0//9 10 5 0//11 3 2 6 8 8 3 1 9 5 6 1 6 5 10 3 11 3 7 7
6 0 0//11 6 8 11 2 4 1 4 11 11 4 11 5 1 7 4 1 10 7 7 1 8 9 9 6 9 8 4 4 6 10 11 2 2 11 2
0/7 8 0/4 4 10 6 8 1 2 0/3 5 10 6 11 9 5 4 5 10 7 8 11 8 9 8 8 1 11 4 2 1 10 10 4 9 4 4
3 11 10 6 4 4 1 10 1 11 6 4 11 2 11 11 4 2 6 4 3 0/10 10 8 4 4 3 8 2 7 1 11 6 10 0/9
11 9 3 1 6 11 7 0/6 6 1 7 6 8 9 8 1 7 1 8 1 10 2 9 8 3 2 7 3 11 10 1 7 2 5 8 9 10 1 10
1 7 3 6 8 4 8 8 5 9 10 1 10 10 5 6 8 9 1 1 11 3 4 3 8 5 6 0/9 8 2 6 5 11 9 10 8 11 10
7 1 11 5 9 1 2 3 9 2 10 3 3 8 7 11 9 11 4 3 1 1 1 0/10 8 7 8 11 8 11 8 0 0/6 2 2 9 3
5 6 1 8 11 8 9 9 6 10 6 5 11 3 9 8 6 6 3 3 4 11 3 5 11 6 6 0/2 11 1 11 1 3 5 8 11 6 5
0/2 0/9 3 8 1 7 3 2 11 8 8 9 8 9 5 9 1 7 4 5 9 1 10 1 4 0/3 4 5 9 8 6 10 8 8 1 6 3 8 3
10 3 2 6 10 5 0/7 6 10 11 7 5 10 4 0/1 9 11 8 7 5 1 3 7 11 0/10 7 4 6 3 9 8 3 6 6/10
7 0/10 6 2 1 2 2 5 4 5 0 11 0 10 0 1 1 11 9 5 4 6 1 11 8 9 10 2 9 3 11 10 11 1 10 0 8
11 5 2 1 2 11 1 6 3 5 7 7 10 9 6 8 5 3 0 0 9 7 11 7 0 5 6 9 0 9 1 1 6 6 2 1 6 0 7 9 4
8 10 0 6 6 10 0 0//1 8 10 2 8 10 7 4 7 10 4 5 2 11 4 4 3 8 10 3 1 5 2 4 4 4 1 6 1 8 1 7
4 8 0 1 8 0 8 2 1 11 5 11 2 4 1 0 11 11 9 8 1 1 6 2 4 6 9 11 5 11 3 2 7 7 10 6 6 0 3
3 9 6 0 11 11 11 8 9 0 3 0 11 2 11 11 10 8 9 5 5 10 7 0 11 6 4 1 11 8 11 2 9 1 8 0 6 8
3 8 6 2 0 10 8 4 6 6 4 8 8 5 2 0 3 4 1 7 1 0 8 4 7 4 4 9 7 2 2 6 3 4 4 10 1 8 7 3 8 8
7 11 7 10 6 9 8 1 6 8 7 4 5 9 9 11 7 10 6 6 7 7 2 3 1 4 10 6 11 7 10 9 6 6 8 1 2 10 1
7 8 2 4 7 9 10 4 10 0 11 1 7 5 2 2 3 7 5 0 1 3 3 10 8 0 4 3 1 2 1 9 11 0 7 10 6 10 7
10 10 9 9 7 1 5 2 5 11 1 4 3 11 9 8 4 2 0 11 8 0 9 7 0 5 3 4 1 5 9 8 6 10 6 4 8 0 9 1
1 11 8 0 8 8 6 6 7 10 9 4 9 3 3 3 5 5 1 3 1 5 7 1 10 7 1 10 1 11 2 3 11 9 4 2 9 9 4 9
2 0 2 6 0 11 10 8 3 2 6 7 3 8 9 7 5 7 6 5 0 0 8 2 7 8 1 11 6 1 8 6 2 8 7 5 11 0 6 4 11
1 11 0 4 3 1 11 4 2 5 2 2 8 1 3 5 9 9 5 9 4 9 8 4 3 4 2 10 0 7 5 6 2 3 3 1 6 2 6 2 0
0 7 8 11 0 6 8 2 1 1 1 11 11 9 2 4 11 11 0 1 1 5 5 6 1 5 5 6 9 5 8 2 1 5 2 0 7 6 9 3 4
11 11 4 1 2 3 8 1 2 4 0 10 6 4 6 2 8 10 7 9 3 4 11 0 7 7 10 10 1 8 3 6 2 3 8 1 6 2 10
11 5 6 3 0 1 0 10 7 11 8 0 11 9 6 6 1 11 2 2 5 8 4 5 3 5 8 2 4 3 7 3 7 1 10 11 7 1 2
8 7 5 2 11 4 10 9 8 2 2 1 5 1 11 11 4 2 4 10 8 8 4 9 5 9 11 10 6 2 2 1 3 10 8 6 11 0 1
1 11 7 11 8 6 3 5 5 6 5 6 10 11 1 10 9 3 10 11 1 3 11 7 0 10 8 5 2 11 2 1 5 9 10 2 1
0 10 8 7 5 6 7 1 9 1 3 4 5 2 1 7 0 0 1 5 4 1 2 2 11 4 0 8 10 9 4 11 11 9 2 0 4 4 10 8
10 9 0 0 11 6 7 9 9 5 5 11 1 5 7 4 9 9 0 0 3 9 9 7 11 3 9 7 5 3 4 5 8 5 8 10 7 6 4 7 7
10 4 0 11 11 8 1 8 3 10 11 7 3 2 10 10 10 1 10 11 3 10 3 11 10 9 2 11 4 1 11 11 0 2 5
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6 11 7 9 6 11 1 7 11 3 1 3 3 5 11 11 6 11 5 0 10 8 3 1 10 0 6 11 7 11 7 11 5 6 1 3 8
9 11 7 3 1 10 2 2 9 3 6 6 1 3 8 4 7 7 6 9 0 9 0 10 6 0 5 5 2 11 5 7 6 9 0 10 11 9 4 11
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7 7 8 1 1 4 3 6 2 5 0 7 1 7 7 3 3 9 1 3 0 5 0 11 4 4 11 11 1 0 0 9 10 6 5 0 11 0 4 4
10 9 4 10 10 0 4 0 4 5 9 7 7 4 10 1 0 6 4 7 10 5 4 10 4 0 8 1 0 2 10 6 9 9 6 8 1 0 7 5
5 7 0 6 10 5 8 2 3 4 5 2 2 0 2 6 7 6 3 7 9 2 10 0 7 10 8 2 7 4 2 4 6 2 1 5 11 3 9 1 9
7 1 6 6 10 2 4 1 3 4 0 10 10 5 3 4 7 2 0 7 2 0 5 5 5 11 0 11 6 1 5 0 0 6 4 6 10 2 6 7
1 6 5 9 11 6 4 1 0 1 2 8 8 1 3 5 5 4 8 8 9 5 3 6 7 3 1 8 3 3 1 8 9 10 10 0 9 3 0 6 2
8 6 9 10 7 8 3 8 3 3 6 9 11 7 9 4 2 5 2 8 8 11 0 1 2 1 2 5 7 4 5 1 5 2 3 1 2 9 11 10 8
10 6 9 7 5 4 2 1 0 4 6 4 10 11 9 10 9 11 7 1 11 8 9 7 1 9 5 8 2 0 6 4 9 2 1 5 9 9 7 5
6 7 11 6 5 8 4 0 0 11 7 6 3 0 1 2 2 11 3 7 8 0 0 6 2 2 6 10 5 10 10 10 10 1 7 8 4 4 2
8 10 5 6 7 1 3 4 1 10 1 7 2 4 5 3 1 11 11 2 4 8 4 4 8 2 5 4 9 8 0 7 2 1 5 2 6 0 6 2 0
11 5 6 1 5 7 4 1 6 8 3 7 4 5 2 6 6 0 0 10 2 3 1 9 0 1 11 5 11 8 5 7 1 7 8 0 10 6 9 6
11 1 3 4 11 11 7 8 11 10 9 4 9 4 5 0 10 2 1 6 8 1 7 6 6 8 7 11 8 1 3 1 1 9 10 3 5 4
1 11 11 6 11 8 9 7 8 2 7 9 1 7 6 1 0 9 6 0 7 1 9 0 3 6 6 8 1 2 9 2 9 3 4 1 11 9 5 11 2
2 3 8 4 4 11 11 0 10 7 9 10 11 8 6 7 1 4 2 0 1 3 0 1 2 3 2 0 2 2 7 4 9 7 8 1 8 7 5 6
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5 1 11 2 1 7 5 10 8 9 2 3 1 0 8 2 3 4 8 2 2 3 8 7 3 4 5 11 11 3 5 5 5 0 5 11 10 11 8
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9 7 3 6 6 0 6 0 9 2 9 0 6 3 6 1 11 2 3 9 8 1 0 6 9 5 9 4 3 7 3 7 3 9 5 5 4 1 10 0 9 8
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1 3 0 5 3 8 8 6 9 6 7 5 11 0 2 7 0 10 2 4 11 9 11 7 5 8 7 4 3 6 0 0 4 11 1 0 2 5 7 3 2
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8 3 2 2 1 9 1 7 5 5 3 7 6 9 11 3 10 11 3 3 2 4 0 1 4 10 11 5 0 2 10 9 8 3 7 6 6 5 3 1
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11 3 1 4 5 3 7 3 8 7 5 11 4 0 1 1 7 0 11 8 8 6 8 4 2 7 8 3 2 11 9 8 6 2 4 3 3 8 5 6 6
8 9 1 3 4 11 6 0 3 10 8 1 6 2 6 8 11 0 2 11 10 9 8 11 0 2 4 4 11 4 11 6 0 6 11 10 10 8
0 10 8 0 4 4 2 9 1 5 3 9 11 3 2 10 0 6 2 5 6 7 1 9 11 0 3 8 4 4 9 11 11 4 2 4 1 4 5 5 9
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5 8 6 10 8 9 1 1 11 6 8 4 3 0 9 10 6 0 8 4 3 5 4 6 8 7 4 9 7 5 2 8 2 0 8 6 4 7 4 3 6

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5 1 4 0 0 1 9 10 1 4 1 3 1 7 8 2 4 8 6 0 2 0 11 3 3 3 11 9 7 8 5 3 5 7 4 8 10 0 8 2 9
8 3 1 2 4 6 9 0 0 1 11 6 11 7 11 0 1 5 5 11 7 11 8 10 0 10 11 6 7 6 4 11 1 4 3 3 6 7 6
4 7 3 4 0 0 0 2 0 3 4 11 11 8 1 1 10 2 2 11 9 10 11 2 3 1 0 1 5 5 4 0 8 1 8 11 7 1 7
10 11 1 5 4 11 9 6 5 5 8 8 11 10 4 2 4 8 7 5 0 4 11 4 9 8 8 7 6 1 6 2 5 3 5 6 8 5 10 7
0 5 0 5 4 11 3 5 8 10 9 6 3 6 0 8 7 10 7 9 6 11 4 11 5 4 11 0 8 9 3 7 5 8 6 3 8 9 11
1 11 11 10 5 8 10 2 10 11 0 7 1 3 1 1 4 11 11 0 11 5 5 9 10 5 3 8 2 3 9 2 0 8 10 11 9
11 5 2 0 10 0 11 0 6 11 7 0 9 3 5 2 1 6 0 11 9 4 4 3 1 8 3 3 1 10 3 9 8 1 1 10 8 3 2 9
4 10 4 0 0 8 4 0 10 1 3 3 11 3 4 1 3 11 1 3 10 8 2 5 0 11 9 10 11 5 0 0 1 2 11 8 1 1
10 11 1 9 5 6 5 1 9 0 8 7 5 8 3 9 8 0 1 4 1 10 11 8 1 0 11 10 8 1 8 2 9 8 7 2 1 4 3 1
4 0 2 2 7 5 10 8 11 2 8 10 0 10 11 4 3 9 3 6 0 9 6 4 10 2 10 10 6 0 8 2 7 7 7 7 10 10
11 1 4 3 7 11 10 0 11 8 9 3 10 11 3 4 10 5 6 0 4 0 10 7 11 11 7 6 8 6 2 7 4 4 1 10 0 6
4 1 11 1 8 8 4 6 7 0 11 10 0 5 5 11 9 11 0 8 1 2 0 9 1 7 11 7 8 7 0 8 9 0 10 9 6 10 9
4 5 2 2 9 11 4 10 10 4 8 6 3 4 3 11 7 1 7 10 0 6 3 4 2 1 1 10 1 1 2 6 6 1 6 1 7 6 1 7
3 6 3 9 10 4 0 8 7 5 7 9 10 10 7 6 1 7 1 11 10 10 6 2 3 10 9 10 4 7 2 1 5 9 5 11 0 1
6 0 8 0 11 4 10 8 3 2 3 0 4 5 0 1 2 0 3 10 2 8 7 2 4 10 8 11 9 3 9 5 4 5 8 8 9 11 2 10
4 6 2 4 11 10 3 11 10 5 10 0 11 10 6 8 10 9 9 0 9 0 6 6 1 5 5 3 0 0 1 7 6 4 4 4 11 6
9 0 2 5 3 7 11 11 0 1 4 0 1 11 11 7 3 1 5 6 8 11 10 10 8 3 2 4 6 5 7 0 5 6 7 9 11 7 6
5 6 1 0 0 10 4 5 10 8 11 1 3 9 0 3 11 9 5 7 7 1 2 11 11 10 4 11 11 4 2 11 10 4 6 8 7 5
3 2 6 10 10 8 0 7 9 2 11 11 3 0 6 4 6 0 10 11 11 4 5 5 7 8 2 11 9 2 11 2 3 7 1 0 7 8
11 8 7 10 5 3 1 1 10 1 9 8 5 9 8)
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