



B911061

<Python Code>

```
import sys

def binomial(n, r) :
    cache = [[0 for _ in range(r + 1)] for _ in range(n + 1)]

    for i in range(n + 1) :
        cache[i][0] = 1
    for i in range(r + 1) :
        cache[i][i] = 1
    for i in range(1, n + 1) :
        for j in range(1, r + 1) :
            cache[i][j] = cache[i - 1][j] + cache[i - 1][j - 1]
    return cache[n][r]

for i in range(0, 101) :
    if i < 10 :
        print("catalan[" + str(i) + "]" + "      :   " + str(binomial(i * 2, i) / (i
+ 1)))
    elif 10 <= i < 100 :
        print("catalan[" + str(i) + "]" + "      :   " + str(binomial(i * 2, i) / (i +
1)))
    else :
        print("catalan[" + str(i) + "]" + "      :   " + str(binomial(i * 2, i) / (i +
1)))
```

<Result>

```
catalan[0]      :   1
catalan[1]      :   1
catalan[2]      :   2
catalan[3]      :   5
catalan[4]      :  14
catalan[5]      :  42
catalan[6]      : 132
catalan[7]      : 429
catalan[8]      : 1430
catalan[9]      : 4862
catalan[10]     : 16796
catalan[11]     : 58786
catalan[12]     : 208012
catalan[13]     : 742900
catalan[14]     : 2674440
catalan[15]     : 9694845
catalan[16]     : 35357670
catalan[17]     : 129644790
catalan[18]     : 477638700
catalan[19]     : 1767263190
```

catalan[20] : 6564120420  
catalan[21] : 24466267020  
catalan[22] : 91482563640  
catalan[23] : 343059613650  
catalan[24] : 1289904147324  
catalan[25] : 4861946401452  
catalan[26] : 18367353072152  
catalan[27] : 69533550916004  
catalan[28] : 263747951750360  
catalan[29] : 1002242216651368  
catalan[30] : 3814986502092304  
catalan[31] : 14544636039226909  
catalan[32] : 55534064877048198  
catalan[33] : 212336130412243110  
catalan[34] : 812944042149730764  
catalan[35] : 3116285494907301262  
catalan[36] : 11959798385860453492  
catalan[37] : 45950804324621742364  
catalan[38] : 176733862787006701400  
catalan[39] : 680425371729975800390  
catalan[40] : 2622127042276492108820  
catalan[41] : 10113918591637898134020  
catalan[42] : 39044429911904443959240  
catalan[43] : 150853479205085351660700  
catalan[44] : 583300119592996693088040  
catalan[45] : 2257117854077248073253720  
catalan[46] : 8740328711533173390046320  
catalan[47] : 33868773757191046886429490  
catalan[48] : 131327898242169365477991900  
catalan[49] : 509552245179617138054608572  
catalan[50] : 1978261657756160653623774456  
catalan[51] : 7684785670514316385230816156  
catalan[52] : 29869166945772625950142417512  
catalan[53] : 116157871455782434250553845880  
catalan[54] : 451959718027953471447609509424  
catalan[55] : 1759414616608818870992479875972  
catalan[56] : 6852456927844873497549658464312  
catalan[57] : 26700952856774851904245220912664  
catalan[58] : 104088460289122304033498318812080  
catalan[59] : 405944995127576985730643443367112  
catalan[60] : 1583850964596120042686772779038896  
catalan[61] : 6182127958584855650487080847216336  
catalan[62] : 24139737743045626825711458546273312  
catalan[63] : 94295850558771979787935384946380125  
catalan[64] : 368479169875816659479009042713546950  
catalan[65] : 1440418573150919668872489894243865350  
catalan[66] : 5632681584560312734993915705849145100  
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catalan[68] : 86218923998960285726185640663701108500  
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catalan[79] : 289450081175264899454283846029490767264392230  
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catalan[91] : 3935312233584004685417853572763349509774031680023800  
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catalan[97] : 14657929356129575437016877846657032761712954950899755100  
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catalan[99] : 227508830794229349661819540395688853956041682601541047340  
catalan[100] : 896519947090131496687170070074100632420837521538745909320