

A212360, Wolfdieter Lang, Jun 25 2012

$a(n,k)$ tabf partition array in Abramowitz-Stegun (A-St) order.

$a(n,k)$ is the total number of necklaces with n beads, each coming in n colors, with a color signature given by the k -th partition of n in A-St order. See the comment section, also in A212359 for details.

The array entry $a(n,k)$ is obtained by multiplying the entries of two arrays: $A212359(n,k) * A035206(n,k)$, for $k=1,2,\dots,p(n)=A000041(n)$, $n \geq 1$. The row sums of this array give $A056665(n)$.

The lists for the rows $n=1..15$ are, with the members of like parts numbers m , from $m=1..n$, collected as sub-lists:

$n=1$: [[1]],

$n=2$: [[2], [1]],

$n=3$: [[3], [6], [2]],

$n=4$: [[4], [12, 12], [36], [6]],

$n=5$: [[5], [20, 40], [120, 180], [240], [24]],

$n=6$: [[6], [30, 90, 60], [300, 1200, 320], [1200, 2700], [1800], [120]],

$n=7$: [[7], [42, 126, 210], [630, 3150, 2100, 3150], [4200, 25200, 12600], [12600, 37800], [15120], [720]],

$n=8$: [[8], [56, 224, 392, 280], [1176, 7056, 11760, 9072, 11760], [11760, 88200, 58800, 176400, 22260], [58800, 470400, 352800], [141120, 529200], [141120], [5040]],

$n=9$: [[9], [72, 288, 720, 1008], [2016, 14112, 28224, 17640, 21168, 70560, 15792], [28224, 254016, 423360, 635040, 846720, 423360], [211680, 2116800, 1411200, 6350400, 1587600], [846720, 8467200, 8467200], [1693440, 7620480], [1451520], [40320]],

$n=10$: [[10], [90, 450, 1080, 1980, 1170], [3240, 25920, 60480, 90720, 46080, 181440, 114480, 151200], [60480, 635040, 1270080, 793800, 1905120, 6350400, 1411200, 1592640, 3175200], [635040, 7620480, 12700800, 28576800, 38102400, 38102400, 2860704], [3810240, 47628000, 31752000, 190512000, 71442000], [12700800, 152409600, 190512000], [21772800, 114307200], [16329600], [362880]],

$n=11$: [[11], [110, 550, 1650, 3300, 4620], [4950, 44550, 118800, 207900, 124740, 89100, 415800, 623700, 415800, 519750], [118800, 1425600, 3326400, 4989600, 4989600, 19958400, 12474000, 16632000, 4989600, 24948000, 11088000], [1663200, 23284800, 46569600, 29106000, 104781600, 349272000, 77616000, 174636000, 349272000, 87318000], [13970880, 209563200, 349272000, 1047816000, 1397088000, 2095632000, 314344800], [69854400, 1047816000, 698544000, 5239080000, 2619540000], [199584000, 2794176000, 4191264000], [299376000, 1796256000], [199584000], [3628800]],

$n=12$: [[12], [132, 792, 2508, 5676, 8712, 5280], [7260, 72600, 217800, 435600, 609840, 165000, 871200, 1531200, 914760, 1017720, 3049200, 637120], [217800, 2940300, 7840800, 13721400, 8232840, 11761200, 54885600, 82328400, 54885600, 68607000, 13741200, 82328400, 51499800, 137214000, 15247980], [3920400, 62726400, 146361600, 219542400, 329313600, 1317254400, 823284000, 1097712000, 658627200, 3293136000, 1463616000, 411760800, 1097712000], [43908480, 768398400, 1536796800, 960498000, 4610390400, 15367968000, 3415104000, 11525976000, 23051952000, 11525976000, 576354240], [307359360, 5532468480, 9220780800, 34577928000, 4610390400, 92207808000, 20746756800], [1317254400, 23051952000, 15367968000, 138311712000, 86444820000], [3293136000, 52690176000, 92207808000], [4390848000, 29638224000], [2634508800], [39916800]],

$n=13$: [[13], [156, 936, 3432, 8580, 15444, 20592], [10296, 113256, 377520, 849420, 1359072, 792792, 283140, 1698840, 3397680, 4756752, 2265120, 7927920, 4756752, 5945940], [377520, 5662800, 16988400, 33976800, 47567520, 25482600, 135907200, 237837600, 142702560, 158558400, 475675200, 99099000, 33976800, 237837600, 356756400, 475675200, 594594000, 264264000], [8494200, 152895600, 407721600, 713512800, 428107680, 917373600, 4281076800, 6421615200, 4281076800, 5351346000, 2140538400, 12843230400, 8027019000, 21405384000, 2378376000, 1605403800, 10702692000, 7135128000], [122316480, 2446329600, 5708102400, 8562153600, 17124307200, 68497228800, 42810768000, 57081024000, 51372921600, 256864608000, 114162048000, 64216152000, 171243072000, 25686460800], [1141620480, 23974030080, 47948060160, 29967537600, 179805225600, 599350752000, 133189056000, 599350752000,

1198701504000, 899026128000, 899026128000], [6849722880, 143844180480, 239740300800, 1078831353600, 1438441804800, 3596104512000, 1078831353600], [25686460800, 513729216000, 342486144000, 3596104512000, 2697078384000], [57081024000, 1027458432000, 2054916864000], [68497228800, 513729216000], [37362124800], [479001600]],

n=14: [[14], [182, 1274, 4732, 13286, 26026, 39494, 22386], [14196, 170352, 624624, 1561560, 2810808, 3747744, 471744, 3123120, 7043400, 11243232, 6569472, 4684680, 18738720, 26234208, 16412760, 19675656], [624624, 10306296, 34354320, 77297220, 123675552, 72144072, 51531480, 309188880, 618377760, 865728864, 412251840, 1442881440, 865728864, 1082161080, 77357280, 618377760, 1082521440, 649296648, 1442881440, 4328644320, 901981080, 961920960, 1803601800], [17177160, 343543200, 1030629600, 2061259200, 2885762880, 2318916600, 12367555200, 21643221600, 12985932960, 14428814400, 43286443200, 9018009000, 6183777600, 43286443200, 64929664800, 86572886400, 108216108000, 48096048000, 5411406000, 43286443200, 27055828800, 108216108000, 24048024000], [309188880, 6956749800, 18551332800, 32464832400, 19478899440, 55653998400, 259718659200, 389577988800, 259718659200, 324648324000, 194788994400, 1168733966400, 730458729000, 1947889944000, 216432216000, 292183491600, 1947889944000, 1298593296000, 146094989040, 486972486000], [3710266560, 89046397440, 207774927360, 311662391040, 779155977600, 3116623910400, 1947889944000, 2597186592000, 3116623910400, 15583119552000, 6925830912000, 5843669832000, 15583119552000, 4674935865600, 166963230720], [29682132480, 727212245760, 1454424491520, 909015307200, 6544910211840, 21816367372800, 4848081638400, 27270459216000, 54540918432000, 54540918432000, 8181137764800], [155831195520, 3739948692480, 6233247820800, 32724551059200, 43632734745600, 130898204236800, 49086826588800], [519437318400, 11687339664000, 7791559776000, 93498717312000, 81811377648000], [1038874636800, 20777492736000, 46749358656000], [1133317785600, 9349871731200], [566658892800], [6227020800]],

n=15: [[15],[210,1470,6510,19110,42210,70350,90090], [19110,248430,993720,2732730,5465460,8198190,4684680,745290,5465460,13663650,24594570,32792760,9112740, 40990950,65585520,38263680,40990950,114774660,22955660], [993720,17886960,65585520,163963800,295134840,393513120,98378280,655855200,1475674200,2361078720, 1377295920,983782800,3935131200,5509183680,3443239800,4131887760,163963800,1475674200,2951348400, 4131887760,3935131200,13772959200,8263775520,10329719400,3060701280,13772959200,5738733000], [32792760,721440720,2404802400,5410805400,8657288640,5050085040,5410805400,32464832400,64929664800, 90901530720,43286443200,151502551200,90901530720,113626913400,16232416200,129859329600,227253826800, 136352296080,303005102400,909015307200,189378189000,202003401600,378756378000,16232416200,151502551200, 227253826800,454507653600,568134567000,505008504000,33667281648], [721440720,18036018000,54108054000,108216108000,151502551200,162324162000,865728864000,1515025512000, 909015307200,1010017008000,3030051024000,631260630000,649296648000,4545076536000,6817614804000, 9090153072000,11362691340000,5050085040000,1136269134000,9090153072000,5681345670000,22725382680000, 5050085040000,6817614804000,5681345670000,5050085040000], [10821610800,292183491600,779155977600,1363522960800,818113776480,2921834916000,13635229608000, 20452844412000,13635229608000,17044037010000,13635229608000,81811377648000,51132111030000, 136352296080000,15150255120000,30679266618000,204528444120000,136352296080000,30679266618000, 102264222060000,10226422206000], [111307996800,3116623910400,7272122457600,10908183686400,32724551059200,130898204236800,81811377648000, 109081836864000,163622755296000,818113776480000,363606122880000,409056888240000,1090818368640000, 490868265888000,35062018992000], [779155977600,21816367372800,43632734745600,27270459216000,229071857414400,763572858048000, 169682857344000,1145359287072000,2290718574144000,2863398217680000,572679643536000], [3636061228800,98173653177600,163622755296000,981736531776000,1308982042368000,4581437148288000, 2061646716729600],[10908183686400,272704592160000,181803061440000,2454341329440000,2454341329440000], [19833061248000,436327347456000,1090818368640000],[19833061248000,178497551232000],[9153720576000], [87178291200]].

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