

CHARACTERIZING AND COMPARING ORDER-OF-ADDITION ORTHOGONAL ARRAYS

Supplementary Materials

S1 Some values of $A_a(\mathcal{U})$

Table S1: The values of $A_2(\mathcal{U})$, $A_4(\mathcal{U})$, $A_6(\mathcal{U})$, $A_8(\mathcal{U})$ and $A_{10}(\mathcal{U})$ for $4 \leq m \leq 15$.

m	$A_2(\mathcal{U})$	$A_4(\mathcal{U})$	$A_6(\mathcal{U})$	$A_8(\mathcal{U})$	$A_{10}(\mathcal{U})$
4	1.333	0.333	0.000		
5	3.333	3.200	0.933	0.067	0.000
6	6.667	15.311	14.933	6.378	1.156
7	11.667	51.644	111.632	127.930	80.032
8	18.667	140.311	555.810	1282.530	1808.610
9	28.000	328.533	2130.713	8509.219	22123.543
10	40.000	689.733	6790.713	42693.818	181898.545
11	55.000	1331.733	18846.713	174728.316	1128407.858
12	73.333	2406.067	46957.824	611794.125	5664547.128
13	95.333	4118.400	107283.291	1892801.861	24094482.629
14	121.333	6740.067	228239.501	5294611.913	89672096.633
15	151.667	10620.711	457408.123	13619623.775	298900937.145

S2 Design matrix of an OofA-OA(48,9,2)

1	3	6	2	9	5	4	8	7
1	5	2	4	9	6	3	7	8
1	5	2	8	3	7	9	6	4
1	7	9	5	4	8	6	2	3
2	4	7	3	9	6	5	1	8
2	6	3	1	4	8	9	7	5
2	6	3	5	9	7	4	8	1
2	8	1	3	4	6	7	5	9
2	8	5	7	4	6	3	1	9
2	8	9	6	5	1	7	3	4
3	1	2	4	5	7	8	6	9
3	1	6	8	5	7	4	2	9
3	1	9	7	6	2	8	4	5
3	5	8	4	9	7	6	2	1
3	7	4	2	5	1	9	8	6
3	7	4	6	9	8	5	1	2
4	2	9	8	7	3	1	5	6
4	6	1	5	9	8	7	3	2
4	8	5	3	6	2	9	1	7
4	8	5	7	9	1	6	2	3
5	1	6	4	7	3	9	2	8
5	1	6	8	9	2	7	3	4
5	3	9	1	8	4	2	6	7
5	7	2	6	9	1	8	4	3
6	2	7	1	9	3	8	4	5
6	2	7	5	8	4	9	3	1
6	4	1	3	8	2	7	5	9
6	4	5	7	8	2	3	1	9
6	4	9	2	1	5	3	7	8
6	8	3	7	9	2	1	5	4
7	1	4	8	9	3	2	6	5
7	3	8	2	9	4	1	5	6
7	3	8	6	1	5	9	4	2
7	5	2	4	1	3	8	6	9
7	5	6	8	1	3	4	2	9
7	5	9	3	2	6	4	8	1
8	2	5	1	9	4	3	7	6
8	4	1	3	9	5	2	6	7
8	4	1	7	2	6	9	5	3
8	6	9	4	3	7	5	1	2
9	1	7	4	6	3	5	2	8
9	1	7	8	2	3	5	6	4
9	4	2	3	5	6	8	1	7
9	4	2	7	1	6	8	5	3
9	5	3	4	6	7	1	2	8
9	5	3	8	2	7	1	6	4
9	8	6	3	5	2	4	1	7
9	8	6	7	1	2	4	5	3

S3 Code

The R program `A008302.r` can be used to generate the numbers $[b(m,0), b(m,1), \dots, b(m,q)]$ for a given positive integer m , where $q = m(m-1)/2$. Actually, the program generates the integer sequence labeled A008302 on the Online Encyclopedia of Integer Sequences (<https://oeis.org>). The text file `b008302.txt` can also be downloaded from the Online Encyclopedia of Integer Sequences. It contains the numbers $[b(m,0), b(m,1), \dots, b(m,q)]$ for m up to 50.

```
#####  
### this program generates integer sequence labeled A008302 on OEIS ###  
#####  
  
rm(list=ls())  
options(scipen=9999)  
  
### load package ###  
library(gmp, warn.conflicts=F)  
  
### program parameters ###  
m<-5  
q<-m*(m-1)/2  
  
### Andrew Woods and Peter Kagey's recursive algorithm ###  
t<-as.bigz(matrix(0,m,q+1))  
t[1,1]<-1  
for (i in 2:m)  
{  
  for (j in 0:choose(i,2))  
  {  
    if (j+1-i>0)  
    {  
      t[i,j+1]<-sum(t[(i-1),j:(j+1-i)])  
      t[i,j+1]<-t[i,j]+t[i-1,j+1]-t[i-1,j+1-i]  
    }  
    else  
    {  
      t[i,j+1]<-sum(t[(i-1),j:1])  
      if (j>0) t[i,j+1]<-t[i,j]+t[i-1,j+1]  
      if (j==0) t[i,j+1]<-t[i-1,j+1]  
    }  
  }  
}  
a<-t[m,1:(q+1)]  
a
```