

2015-11-09, 19:22 Mon

22:22

Turning the matrices sideways is cleaner
 Making the main diagonal vertical makes its distinction more obvious, and multiplication a bit more intuitive (left-right operands are in that order, with the product below them). Listing:

(a) $\begin{matrix} \diamond & \diamond & \diamond & \diamond & \diamond & \diamond & \diamond & \diamond \\ \vdots & \vdots & \vdots & \vdots & \vdots & \vdots & \vdots & \vdots \\ \vdots & \vdots & \vdots & \vdots & \vdots & \vdots & \vdots & \vdots \end{matrix} \quad \begin{matrix} \diamond & \diamond & \diamond & \diamond \\ \vdots & \vdots & \vdots & \vdots \\ \vdots & \vdots & \vdots & \vdots \end{matrix}$

(b) $\begin{matrix} \diamond & \diamond & \diamond & \diamond & \diamond & \diamond & \diamond & \diamond \\ \vdots & \vdots & \vdots & \vdots & \vdots & \vdots & \vdots & \vdots \\ \vdots & \vdots & \vdots & \vdots & \vdots & \vdots & \vdots & \vdots \end{matrix} \quad \begin{matrix} \diamond & \diamond & \diamond & \diamond \\ \vdots & \vdots & \vdots & \vdots \\ \vdots & \vdots & \vdots & \vdots \end{matrix}$

(c) $\begin{matrix} 1 & 1 & -1 & 1 & a & -a & -1 & b & i & -i & -b \\ \vdots & \vdots & \vdots & \vdots & \vdots & \vdots & \vdots & \vdots & \vdots & \vdots & \vdots \end{matrix}$

(d) $\begin{matrix} \diamond & \diamond & \diamond & \diamond & \diamond & \diamond & \diamond & \diamond \\ \vdots & \vdots & \vdots & \vdots & \vdots & \vdots & \vdots & \vdots \\ \vdots & \vdots & \vdots & \vdots & \vdots & \vdots & \vdots & \vdots \end{matrix} \quad \begin{matrix} \diamond & \diamond & \diamond & \diamond \\ \vdots & \vdots & \vdots & \vdots \\ \vdots & \vdots & \vdots & \vdots \end{matrix}$

As shown by the last line, ⁿ⁼² the dashes are flipped in binary order, in this case counting down just so a vertical dash translates into the visually similar one. In the (b) dash representation, ^{size of} the next set of ~~dash~~ matrices ^{size of} for after doubling the matrix width is found by multiplying the number of matrices in the earlier set by 4^n (# of dashes), e.g., for $n=3$, $m=8$, take the 8 elements of $n=2$ and multiply them by 4^2 , giving $2^7 = 128$.

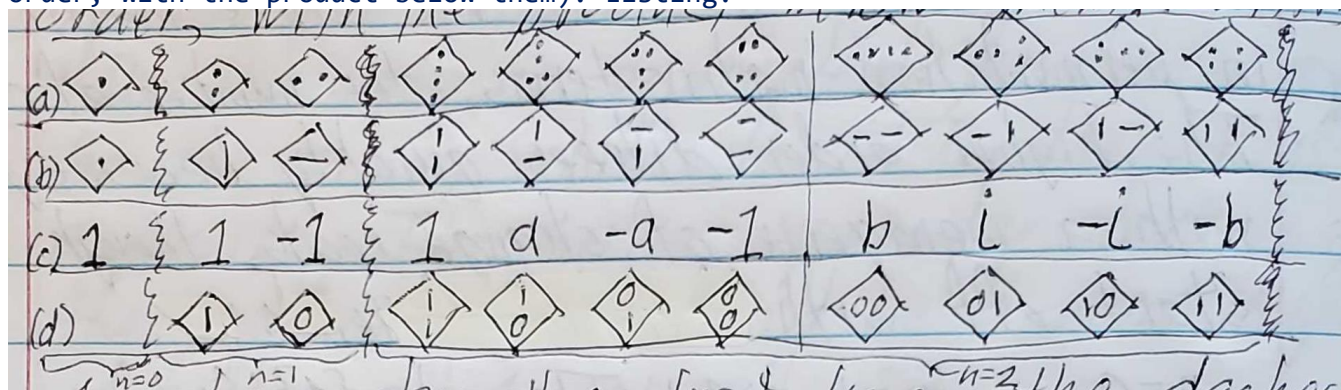
There is an interesting bit of patterning in the $n=2$, $m=4$, 8-element set that creates both i and two unnamed (here called a and b) $\sqrt{-1}$; the two $\pm i$ values emerge on the other half.

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[2015-11-09.19:22 Mon> [22:23]

[Turning the matrices sideways is cleaner]

Making the main diagonal vertical makes its distinction more obvious, and multiplication a bit more intuitive (left-right operands are in that order, with the product below them). Listing:



As shown by the last line, the dashes are flipped in the binary order, in this case

Counting down just so a vertical dash translates into the visually similar one.

In the (b) dash representation, the size of the next set of matrices after doubling

the matrix width is found by multiplying the number of matrices in the earlier set by $4^{(\text{\#of dashes})}$, e.g., for $n=3$, $m=8$, take the 8 elements of $n=2$ and multiply then by 4^2 , giving $2^7=128$.

There is an interesting bit of patterning in the $n=2$, $m=4$, 8-element set that creates both i and two unnamed (here called a and b) $\text{sqr}(1)$; the two $\pm I$ values merge on the other half.

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