

# Perfect Squares

$$n=12$$

$$\text{output} = 3$$

$$\text{explanation} = 4 + 4 + 4$$

$$n=13$$

$$\text{output} = 2$$

$$\text{explanation} = 9 + 4$$

$$\text{Using } n=28, \text{ Squares} = \begin{matrix} & 0 & 1 & 2 & 3 & 4 \\ & 1 & 4 & 9 & 16 & 25 \end{matrix}$$

Populate another list of same size with the number of squares needed to add up to  $n$ , starting at  $\text{Squares}[i]$

$$i=0 \rightarrow [28] \quad 1+1+1+\dots+1=28$$

$$i=1 \rightarrow [28, 7] \quad 4+4+\dots+4=28$$

$$i=2 \rightarrow [28, 7, 4] \quad 9+9+9+1=28$$

$$i=3 \rightarrow [28, 7, 4, 5] \quad 16+9+1+1+1=28$$

$$i=4 \rightarrow [28, 7, 4, 5, 4] \quad 25+1+1+1=28$$

then take the min from this latter list

$$\text{output} = 4 \quad \text{why?} \quad 9+9+9+1 \quad \text{or} \quad 25+1+1+1$$

\* The max-square possible ( $\text{Squares}[\text{len}(\text{Squares})-1]$ ) is not always the choice

$$n=12$$

$$\text{Squares} = [1, 4, 9]$$

$$\text{with } 9: \text{output} = 4 \quad (9+1+1+1=12)$$

$$\text{with } 4: \text{output} = 3 \quad (4+4+4=12)$$