ALGORITHMS

Algorithm 1: Calculation of length of each piece for the cube(Design 1)

Input: length of the wood

Output: length of smaller pieces of wood that need to be cut from the entire wood

len = length/12

return len

Algorithm 2: Calculation of length of each piece for the cube(Design 2)

Input: length of the wood, thickness, width

Output: length of smaller pieces of wood that need to be cut from the entire wood

$$len1 = \frac{length+8*thickness+8*width}{12}$$

$$len2 = \frac{length-16*width+8*thickness}{12}$$

$$len3 = \frac{length+8*width-16*thickness}{12}$$

return len1, len2, len3

Algorithm 3: Calculation of length of each piece for the cube(Design 3)

Input: length of the wood, thickness, width

Output: length of smaller pieces of wood that need to be cut from the entire wood

$$len1 = \frac{length+8*width+8*thickness}{12}$$

$$len2 = \frac{length-16*thickness+8*width}{12}$$

$$len3 = \frac{length+8*thickness-16*width}{12}$$

return len1, len2, len3

Algorithm 4: Calculation of volume of the cube

Input: length of the wood

output: volume of the cube

len = length/12

sidesquared = len^2

area = 6 * sidesquared

volume = $area^3$

return volume

Algorithm 5: Calculation of length of each piece for the triangle base pyramid

Input: length of the wood

Output: length of smaller pieces of wood that need to be cut from the entire wood

len = length/6

return len

Algorithm 8: Calculation of volume of the triangle base pyramid

Input: length of the wood

Output: Volume of the pyramid

len = length/6

basearea = $\left(\frac{\sqrt{3}}{4}\right) * sidelength^2$.

hieght = $\left(\frac{\sqrt{6}}{3}\right) * sidelength$.

volume = (basearea * hieght)/3

return volume

Algorithm 7: Calculation of length of each piece for the square base pyramid

Input: length of the wood

Output: length of smaller pieces of wood that need to be cut from the entire wood

len = length/8

return len

Algorithm 6: Calculation of volume of the square base pyramid

Input: length of the wood

Output: Volume of the pyramid

len = length/8

sidesquared = len^2

diagonal = $\sqrt{2 * sidesquared}$

hieght = $\sqrt{sidesquared - (\frac{diagonal}{2})^2}$

volume = (sidesquared*hieght)/3

return volume