

# Project 3: Building Beehives

COSC 1423 | Fall 2023

Instructor: Megan Avery

**Topics:** calculations, strings, constants

**Goal:** Determine stats about material needed to build a beehive of a particular size.

**Turn In Instructions:** See Project FAQ

**Objective Definition (15 pts):** See Planning Guide

**Style (10 pts):** See Style Guide

**Implementation (55 pts):**

You are building a beehive made up of wooden hexagons glued together. You know you have an infinite number of 12 x 24 inch sheets of wood available for purchase and you can assume that the hexagons will fit neatly onto the sheets of wood. Each sheet of wood costs \$24.99, you can buy a fraction of a piece of wood.

The formula for area of a hexagon is  $(\frac{3\sqrt{3}}{2}x^2)$  where x is the length of a side on the hexagon.

*Hint:  $\sqrt{3}$  is the same as  $3^{(1/2)}$*

You are tasked with determining the amount of wood and cost to build a beehive of a particular size. This calculation is based on the base dimension of the hexagons and how many hexagons there will be, both values gathered from the user.

You will need to calculate (in this order):

- how many square inches of wood are needed
- how many sheets of wood are needed, a fraction of a sheet can be purchased
- the price of buying all the wood they need

Print all the stats calculated above to the screen. Be sure to format the money properly and print the square inches needed and wood needed to 3 decimal places.

**Test Cases (10 pts):** See Project FAQ

**Followup Questions (10 pts):**

1. How long did this program take you to write?
2. Did you complete the extension? If not, why not?
3. What was the most challenging part of this assignment? Explain.
4. What did you learn from the process of doing this assignment?
5. Explain your usage of AI in this project. What type of queries did you do during development?

**Extension (+5 pts):**

Figure out how much it would cost to put a border around each edge of the honeycomb. Assume each individual hexagon has a border before the honeycomb is constructed and the border is 6 inches tall.