Understanding the Problem

This assignment is asking me to create a program that will take the user through a game of plants vs zombies style tower defense but with ants and bees instead. The game will be played on one array with the ant queen on the first element and the beehive on the 10th element. Bees will be generated at the beehive and travel to the queen. If the bees reach the queen, the game ends and the bees win. If the defending ants kill all bees in the array, the ants win. Bees can occupy the same element in the array (square) and some ants can do the same. To do this, I am thinking of multidimensional jagged arrays. The 1D array will contain the board then where there is more than one element on the square, I will create another array on that square. (using this method, it can be scalable for extra credit)

In each turn a bee needs to be generated, then the player can place ants, then the ants attack (their turn), then the bees attack or move. If the bees reach the queen, element 1, then they win. If there are no more bees on the board, the ants win.

Input/Output
The input will be the options from the user to place ants or not. Output will be the board moving along each turn

Subtasks
The subtasks I will need to complete consist of creating multiple functions and structures to organize, print, and move ant and bee objects. I will need to create base classes for each type of object then have derived objects for specialized

Program Design

Gameboard

At the top I want to display the stats then have the board below it. Basically, just keep copying plants v zombies style

Pseudocode

Main(int argc, char** argv){

Create game board and fill with objects
        This includes making a 3D jagged array of the entire board.
        Rows and columns will be normal but the 3rd array will be for elements on each square. This should be a entity type array (generic type that bees and ants can be placed into)
Call bee generation function
        Generates a bee on the right of the board
Call ant placement function
        Player gets to place ants
        This should be something like a chess board for placement. Ant type: Fire Location: A7

Call ant turn

       Ants can attack

Call bee turn

       Bees attack or move to the left

Check queen

       If bee is on element 1 of any row, bees win

Check bee numbers

       If bee numbers = 0 then ants win

Separate file

Create ant class

       Protected elements should be armor

       Public elements should be virtual functions that the inherited classes would use and redefine.

Create bee class

       Protected elements should be health

       Public elements should be move function and functions to manage armor (health)

Variables to create:

I will need to create the gameboard as a 3D jagged dynamic array because it the third dimension of it will be constantly changing through the turns. I will need to generate new bees and ants turn for turn as the player plays the game. Creating ants needs to consist of the type of ant, then upcasting it to a generic object type then adding them to the spot the player wanted

Decisions:

I need to decide how the player will be able to place objects on the board. I need to decide how to get ants and bees on the same array of elements and have the turns go through the entire board for objects who have it. I will need to initialize the board so that calling functions on blank spaces doesn't call them on garbage values. Need to decide how to implement the special functions of each ant and have a supply variable that will count the food available.

Functions to handle simple error checking will be extremely useful. Functions to dynamically create, sort, and print data will be made as well and utilized heavily.

Prompt	Input	Output
If you would like to place an ant, what type do you want?	Harvester	Where would you like to place it?
Where would you like to place it	A7	There is already an ant there, please choose another place
Where would you like to place it	A1	Places ant on A1
*Time to place ants	NA	Don't have enough food, no ants can be placed

If you would like to place an ant, what type do you want?	Bodyguard	Where would you like to place it?
Where would you like to place it?	Sdf t6e46d4sdf	Unable to read the space, please try again
Where would you like to place it?	B2	Places bodyguard ant there
Ants win! Would you like to play again?	Yeah sure why not	Plays again and resets the board