Level 3 Special Project

Graphs
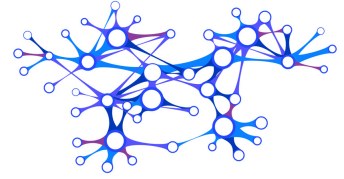
Prerequisite Concepts	Concept 12
Key Concepts	Concept 15

A *bipartite graph*, also called a *bigraph*, is a graph whose vertices can be placed into two disjoint sets, V_1 and V_2, such that all edges in the graph connect a vertex in the first set (V_1) to a vertex in the second set (V_2). If two sets (e.g., V_1 and V_2) are *disjoint*, then they have no elements (e.g., vertices) in common.

The graph shown in the figure below is a complete bipartite graph. The set V_1 consists of the vertices in the top row while the set V_2 consists of the vertices in the bottom row.

Note that there are $8 * 8 = 64$ edges in this graph. Using techniques described in the code-along associated with this section it is possible for a Bricklayer program whose text contains $8 + 8 = 16$ function calls to create all 64 edges when executed. In such a program, 8 function calls will be to the Bricklayer *lineXZ* function. The other 8 function calls are to a user-defined function (i.e., a function that you will need to write). Each call to the user-defined function will used Bricklayer's lineXZ function to draw 8 edges. Thus, 8 calls to this user-defined function will create $8 * 8 = 64$ edges.

Using the approach described in the previous paragraph, write a Bricklayer program that creates a bipartite graph similar to the one shown below. Before building this artifact it is recommended that you complete all Vitruvia exercises for Concept 15.