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PROGRAMMING ASSIGNMENT 1:

Objective:

Part 1 – Map: Implement a group of Java classes that would allow for creation of custom maps for use in a Tower Defense game.

Solution:

In order to achieve the objective stated above, a package of five (5) Java classes (MapComponents) was written, as follows: Map, Tile, PathTile, SceneryTile, PathException. An additional class named Driver was implemented to provide textual based testing functionality.

Summary of functionality of MapComponents:

In short, a map is represented by a two-dimensional array of Tiles that can be of either of the two available subtypes: SceneryTile or PathTile. By default all map tiles are SceneryTiles, whereas PathTiles are used to represent path. When placed on a map, a path is a sequence of linked PathTiles. A PathException is set to occur if incorrect generation, manipulation or placement of path is performed. Once a path is generated, an instance of Map keeps track of the entry and the exit points of the path. A valid map is one that contains a continuous path such that the exit is reachable from the entry. A method to verify if map is valid is provided.

Additional functionality includes placement of various Tile types on existing map, generation of random SceneryTiles on an existing map, toString methods for instances of map and tiles, path building methods, as well as other helper methods required for intended functionality.

Driver class includes testing of all aspects of the implemented package. It is set to generate empty, empty with path, random empty, and random with path maps. Driver uses toString methods provided in Map and Tile classes to print maps to console and thus allow for visual inspection of map instances.

To allow for convenient navigation, Javadoc HTML API is provided with the submission. Most methods contain description of their functionality.

Note to grader: some methods are private and thus do not appear in the API.