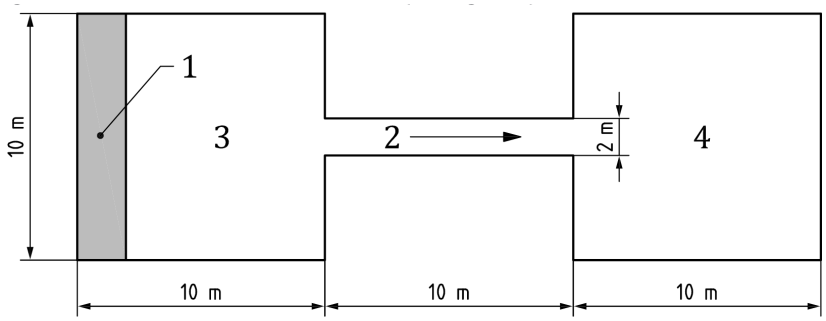
Horizontal Counter-Flow Assessment

The purpose of this assignment is to evaluate the capability of models in accurately depicting horizontal counter-flows.

Visualize two square rooms, each measuring 10 m by 10 m. These rooms are interconnected by a corridor that is 10 m long and 2 m wide, originating from the center of one side of each room and connecting to the center of one side of the other room, as depicted in the provided figure.



Key

1	100 persons	3	room 1
2	direction of movement	4	room 2

Figure 1: Diagram of Two Rooms and Connecting Corridor

Methodology

Select a group of 100 individuals, representing a crowd with a pre-evacuation time of 0 seconds. Assign walking speeds to these individuals that reflect the typical demographic of the building's occupants.

- **Step 1**: Position all 100 individuals in room 1, filling the space from the left side with the highest possible density. Start the movement of these occupants towards room 2 and note the time when the last individual enters room 2.
- **Step 2**: Repeat Step 1, but this time add an additional group of 10, 50, and 100 agents in room 2. These agents should have the same characteristics as those in room 1. Both groups move simultaneously towards the opposite room, and again, record the time it takes for the last person from room 1 to enter room 2.

Objective Analysis

Question to be addressed: How does the total evacuation time vary with the number of individuals involved in the counter-flow from room 2?

Data Visualization

Create a graph to illustrate the relationship between the number of pedestrians in room 2 and the total evacuation time. This graph will help in visualizing how the evacuation dynamics change with varying crowd sizes in counter-flow scenarios.