CSC 211 PRACTICAL 2 REPORT

KAAMIEL ISAACS, 4129581

Given the amount of babies as well as the arrival and departure times of the babies in the creche, we are thus able to compute how many pairs of babies are at the creche at the same time using the following algorithm.

1. Create a 2-dimensional array. Each row in this 2-dimensional array is used to represent each baby that attended creche on that day, whilst the two columns represent the arrival and departure times, respectively.
2. Initialize an empty list which would eventually store the babies that were present at the creche at the same time.
3. For each baby in the creche, check if their arrival time is before or after the departure time of the next baby. Use a for loop, to loop through the times of each baby. Use an if statement, for if the one baby's arrival time is after the next baby's departure time, the program will move on and compare to the next baby. If, however, the baby's arrival time is before the next baby's departure time, add these pair of babies to the initialized list.
4. Once your for loop has run through all the babies, print out the pairs of baby's that were present at the creche at the same time.

The time complexity of this algorithm is $O(n^2)$. This is because for each baby(n), the algorithm is dependent on the baby's arrival and departure times.

Report

1. Introduction

The algorithm which was to be determined was an algorithm that was given a certain amount of babies, as well as their arrival and departure times to a creche. Given those inputs, the algorithm computes how many pairs of babies were present at the creche at the same time.

2. Contact Tracing Algorithmic Solution

Step 1: Initialize a Scanner that will take the amount of babies as input.

Step 2: Create a 2-dimensional array.

Step 3: Initialize an empty list.

Step 4: Initialize another Scanner that will take in the arrival and departure time in the creche, respectively, that is separated by ",".

Step 5: Use a for loop, to loop through the arrival and departure times of each baby.

Step 6: Use an if statement, for if the one baby's arrival time is after the next baby's departure time, the program will move on and compare to the next baby.

Step 7: If, however, the baby's arrival time is before the next baby's departure time, add these pair of babies to the initialized list.

Step 8: Once the program has finished looped through all the times of the babies, print out the pairs of babies that were present at the creche at the same time.

3. Explanation of Algorithmic Solution in (2.0)

Step 1: This is to take in the amount of babies that times' will be compared.

Step 2: Each row in this 2-dimensional array is used to represent each baby that attended creche on that day, whilst the two columns represent the arrival and departure times, respectively.

Step 3: This is to store the pairs of babies that are present in the creche at the same time.

Step 4: This is to take in the times of the babies arrival and departure, in order to be compared.

Step 5: This is to iterate through the babies times, to find the intersections where the babies are both at the creche at the same time.

Step 6: If the babys arrival time and another babies departure time does not intersect, it means that the babys were not there at the same time.

Step 7: This means that if the babies arrival and departure time do intersect, that they were there at the same time.

Step 8: The program finishes and completes its task by printing out the amount of babies that were at the creche at the same time.