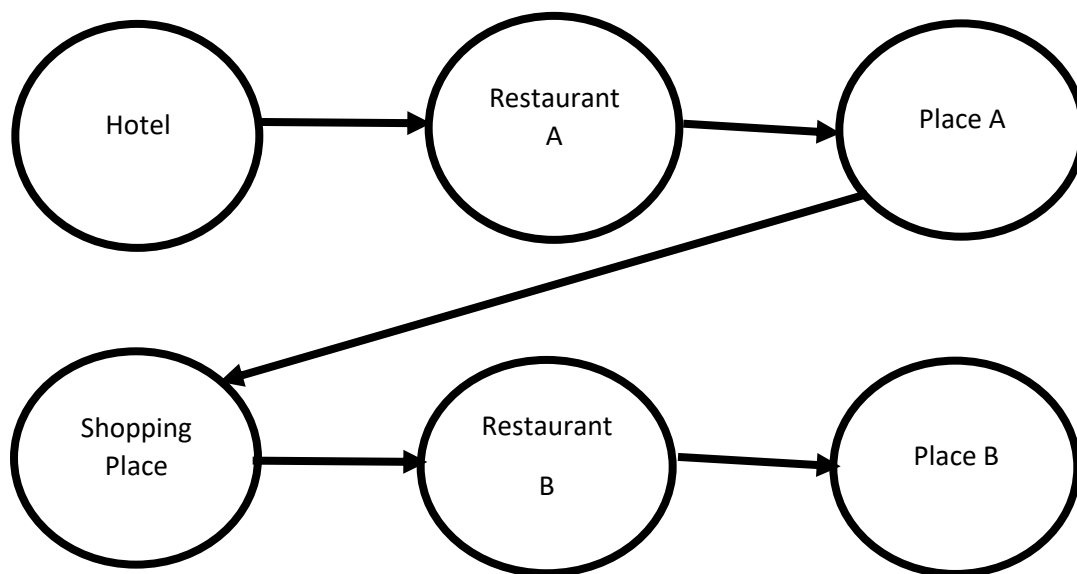


- 1- Calculate the distance between the city the user is going from to the capital of the country that he/she wants to go to, if it is greater than 500km the system should recommend traveling by plane and if it is less than 500km the system should recommend traveling by car or by train (if the number of people is less than or equal to 4 "car" else train) and the price of the plane ticket will be:

$$\text{ticketPrice} = \text{distanceBetweenAirports} * \text{constant}$$

- **distanceBetweenAirports**: the distance between the airport of the user's city and the capital airport in kilometer.
- **constant**: 0.5\$ for example

- 2- On day one of the trip, the starting node will be the airport of the country's capital; on all the other days, the starting node will be the hotel he is currently at.
- 3- After filtering the data according to the user preferences we are going to end up with a list of restaurants, a list of other places(night places, old places, etc.) and a list of shopping places.
- 4- The general itinerary should be as follows:

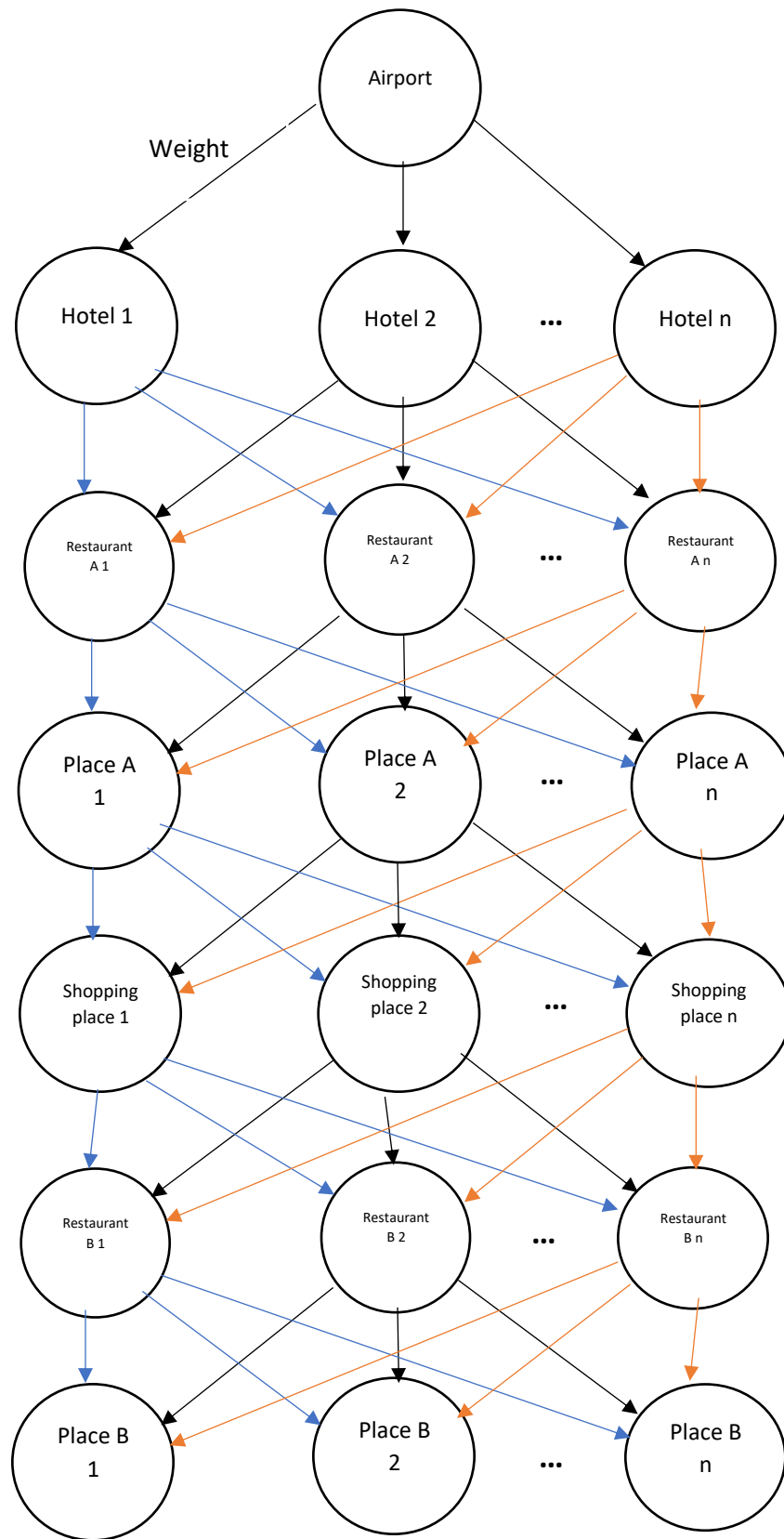


- 5- The number of days the user is going to spend in each city will be:

$$\text{cityNumberOfDays} = \text{Math.floor}(\text{numberOfDays} / \text{numberOfCities})$$

- **numberOfDays**: the number of days the user is going to spend on his trip.
- **numberOfCities**: number of cities in the destination.
- If **cityNumberOfDays** is equal to 0 then we are going to remove the farthest city from the capital from the **numberOfCities** array and recalculate the **cityNumberOfDays** until it is equal to 1.

- 6- On the first day the itinerary is going to look like this:



Notes:

- place A will be a natural place or an old place.
- place B will be a night place or (natural place or an old place).
- the weight of the edges is going to be:

weight = (the distance between the nodes + destination node price) / 2

- 7- the shortest and cheapest path is then calculated using dijkstra's Algorithm.
- 8- After finding the path we should calculate the total prices of its node if the (total price * number of people) is greater than the day's budget then we should show the user an error message "The budget u have provided is not enough to go to this country, please make the budget higher".
- 9- The recommended transportation method between nodes should be as follows:

Distance <= 1Km; walking

30km >= Distance > 1km; car

100km >= Distance > 30km; train

Distance > 100km; plane