Algorithm 1 Initial Assignment Algorithm

Input: $\mathrm{C}_f, C_{nf}, V, P$ ▷ Frequent, Non-Frequent customers, vehicles and planning horizon

A. Frequent Customer Assignment with Randomization

Shuffle C_f ▷ Random shuffle of frequent customers
for each c in C_f **do**
    cvp ← Dictionary to store costs and positions for each vehicle per period
    for each p in P **do**
        if c **has demand** in *p* **then**
            for each vehicle *V* compatible with the c **do**
                for each position in vehicle's route **do**
                    if customer insertion is valid at *position* **then**
                        mc ← Move cost without inserting customer
                        if *mc* < cvp[V]["cost"] **then**
                            Update *cvp* with the lower cost and position
                        end if
                    end if
                end for
            end for
        end if
    end for
    Calculate total insertion cost per vehicle for the customer
    Select **best vehicle** with the minimum total insertion cost
    Insert customer into *best vehicle* at the selected position per period
end for

B. Non-Frequent Customer Assignment with Randomization

Shuffle C_{nf} ▷ Random shuffle of non-frequent customers
for each c in C_{nf} **do**
    for each p in the P **do**
        if c **has demand** in *p* **then**
            Calculate insertion costs for all compatible vehicles
            Choose randomly the best vehicle among the top-k candidates
            Insert *c* at the best insertion position in chosen vehicle
        end if
    end for
end for

Output: Initial solution with assigned routes and total cost