Algorithm 1 Supply Chain Network (SCN) Generator

n : Number of items in the Bill of Material (BOM), default $n \sim U(8, 20)$
$root$: Number of root items, default $root \sim U(2, n/2)$
$depth$: Maximum tier or depth of the BOM tree, default $depth = 3$
$max\_parents$: Maximum number of parents an item might have, default $max\_parents = 2$
$seed$: Random number seed for reproducibility, default $seed \sim U(0, 10000)$
min_demand : Minimum demand for final items (leaf nodes), default $min\_demand = 10$
max_demand : Maximum demand for final items (leaf nodes), default $max\_demand = 100$
$nb\_locations$: Number of facility locations to be generated, default $nb\_locations \sim U(n/2, n)$
$BOM \leftarrow$ `BOM_generator(`$n, root, depth$,
    `max_parents, min_demand, max_demand, seed)`
$Facilities \leftarrow$ `Facility_generator(nb_locations, seed)`
$SCN \leftarrow$ `Mapping(BOM, Facilities,seed,min_demand,max_demand)`

return SCN