

CLAIMS

1. A method, performed by an electronic device, for assigning a plurality of items into a plurality of containers, the method comprising:
 - obtaining, for each respective item of the plurality of items, a plurality of attributes associated with the respective item, the attributes comprising at least a volume and a weight of the respective item;
 - obtaining a set of container parameters associated with a corresponding container, the set of container parameters comprising one or more of a volume of the container or a residual capacity of the container;
 - obtaining one or more constraints, wherein the one or more constraints are associated with the plurality of attributes associated with a respective item and limit assigning items in a same container;
 - sorting and indexing the plurality of containers in volume order;
 - sorting and indexing the plurality of items based on one or more of volume or weight;
 - identifying a first indexed container of the plurality of containers;
 - initializing a residual capacity vector of the first indexed container based on a total capacity of the first indexed container;
 - identifying a first indexed item of the plurality of items;
 - determining, based on the residual capacity vector of the first indexed container and on one or more of the volume or weight of the first indexed item, that the first indexed item satisfies a capacity criterion for the first indexed container;
 - determining, based on the one or more constraints, that the first indexed item satisfies a constraint criterion associated with the first indexed container;
 - determining an assignment, based at least in part on the first indexed item satisfying the capacity criterion and the constraint criterion, of the first indexed item to the first indexed container;
 - updating, based on the assignment, the residual capacity vector of the first indexed container based on one or more of the volume or weight of the first indexed item;

- removing, based on the assignment, the first indexed item from the plurality of indexed items; and
- outputting, based on the assignment, an assignment plan of the items into the containers.

5

2. The method according to claim 1, comprising:

- determining whether attributes associated with a first item violates the one or more constraints,
- upon determining that the attributes associated with the first item do not violate the one

10

or more constraints, assigning the first item to a first container.

3. The method according to any of the previous claims, comprising:

- optimizing a set of performance parameters indicative of shipping performance based on the attributes, the set of container parameters and the constraints by applying, to an item

15

set comprising the items, and a container set comprising the one or more containers, an assignment scheme based on a next-fit-decreasing (NFD) algorithm with a plurality of counters indicative of the corresponding constraints placed on the attributes of the corresponding items.

20

4. The method according to claim 3, wherein the set of performance parameters comprises one or more performance parameters indicative of cost associated with the one or more containers, and/or a capacity associated with the one or more containers.

25

5. The method according to any of the previous claims, wherein the attributes comprise one or more of: a shipping order, a purchase order, a date of arrival at origin warehouse, an origin port, a destination port, a plant code, an expected time of arrival, a cargo type, a stoke keeping unit, a vendor attribute, a volume of the cargo, and a weight of the cargo.

6. The method according to any of the previous claims, wherein the set of container parameters comprises one or more of: a volume of the container, a residual capacity of the container, and a maximum capacity of the container.

5 7. The method according to any of the previous claims, comprising:

- determining, for each item, and based on the attributes associated with the item, whether the item fits into a residual capacity of a container of the one or more containers, without violating the constraints.

10 8. The method according to claim 7, comprising:

- when it is determined that the item fits into the residual capacity of the container without violating the constraints, assigning the item to the container.

9. The method according to any of claims 7-8, comprising:

15 - when the item does not fit into the residual capacity of the container without violating the constraints, forgoing the assignment of the item to the container.

10. The method according to any of the previous claims, comprising:

20 - determining a number of conflicts in a container, wherein the conflicts are related to violation of the constraints;

- determining whether the number of determined conflicts satisfy a criterion;

- when it is determined that the number of determined conflicts does not satisfy the criterion, the method comprises terminating the process; and

25 - when it is determined that the number of determined conflicts satisfy the criterion, the method comprises continuing to assign items.

11. The method according to any of claims 2-10, comprising:

- upon determining that attributes associated with the first item violate the one or more constraints, assigning (S108I) the first item to a container other than the first container.

5 12. An electronic device comprising a memory circuitry, a processor circuitry, and an interface, wherein the electronic device is configured to perform any of the methods according to any of claims 1-11.

10 13. A computer readable storage medium storing one or more programs, the one or more programs comprising instructions, which when executed by an electronic device with a display and a touch-sensitive surface cause the electronic device to perform any of the methods of any of claims 1-11.