**Use case 1:**

A customer visits the company office in Sydney on Oct 8th.

They bring a package that needs to be delivered to Melbourne.

An employee of the company records the customer’s contact info, weighs the package at 45kg and then checks for a suitable delivery route.

The system reports that there are two routes:

-   Brisbane (Oct 10th 06:00h) → Sydney (Oct 10th 20:00h) → Melbourne (Oct 11th 18:00h)

-   Sydney (Oct 12th 06:00h) → Melbourne (Oct 12th 20:00h) → Adelaide (Oct 13th 15:00h)

Both routes' trucks have free capacity, and the employee suggests the first one, as the package will arrive one day earlier.

The customer agrees and the employee uses the system to add the delivery package to the first route and to update the package’s expected arrival time to Oct 11th 18:00h.

1. **There is a route with start and end locations (provided by the customer) with an available truck assigned to it.**

**Input:** RegisterCustomer steven1 [steven\_jones1@gmail.com](mailto:steven_jones1@gmail.com) steven jones

**Output:** Customer with username: steven1 has been registered!

**Input:** CreatePackage Alice Springs Melbourne weight

**Output:** Package with ID: 21 has been created!

**Input:** ViewPackage IdPackage

**Output:**

PackageID: 21

Package weight: 45 kg

Package start location: Alice Springs

Package end location: Melbourne

Package entry date: 09/02 Friday @ 11:30

Package final ETA: **Package is still unassigned.** **- >** **default message – changes when packages is assigned to route, gets the date from the route location ETA**

Package status: **unassigned (unassigned => assigned => in progress) - >** **default message – changes when packages is assigned to route, and depends on the current date**

RouteID: **Package is still unassigned.** **- >** **default message – changes when packages is assigned to route, gets the route’s ID**

**Input:** ShowRoute

**Output:**

RouteID: 1

Route status: scheduled **(open => scheduled => on route => arrived)**

Route locations: Perth (15/02 Thursday @ 06:00) → Melbourne 16/02 Friday @ 22:00

Route distance: 3509 km

Route capacity: 13 555 kg

Route start date: 15/02 Thursday @ 06:00

Route final ETA: 16/02 Friday @ 22:00

PackageID: 1, 5, 7, 8, 17, 15, 21

TruckID: 1011

===============

RouteID: 2

Route status: scheduled

Route locations: Alice Springs (16/02 Friday @ 06:00) → Melbourne 17/02 Saturday @ 07:00

Route distance: 2255 km

Route capacity: 10 139 kg

Route start date: 16/02 Friday @ 06:00

Route final ETA: 17/02 Saturday @ 07:00

PackageID: 2, 6, 10, 11, 12

TruckID: 1026

===============

RouteID: 3

Route status: scheduled

Route locations: Bristbane (17/02 Saturday @ 06:00) → Adelaide 18/02 Sunday @ 04:00

Route distance: 1927 km

Route capacity: 28 744 kg

Route start date: 17/02 Saturday @ 06:00

Route final ETA: 18/02 Sunday @ 04:00

PackageID: 2, 6, 10, 11, 12

TruckID: 1026

===============

**Input:** ViewRoute RouteId

**Output:**

RouteID: 2

Route status: scheduled

Route locations: Alice Springs (16/02 Friday @ 06:00) → Melbourne 17/02 Saturday @ 07:00

Route distance: 2255 km

Route capacity: 10 139 kg

Route start date: 16/02 Friday @ 06:00

Route final ETA: 17/02 Saturday @ 07:00

PackageID: 2, 6, 10, 11, 12

TruckID: 1026

**Input:** ViewTruck TruckID

**Output:**

TruckID: 1026

Truck max capacity: 27 000 kg

Truck max range: 8 000 km

Truck status: available **(available => unavailable) - >** **default message – changes when packages is assigned to route, and depends on the current date, the route capacity, the truck max capacity**

Truck complete availability after: 16/02 Friday @ 06:00 - 17/02 Saturday @ 07:00

**Input:** AddPackageToRoute RouteId PackageId weight **(validation if route capacity < truck max capacity)**

**Output:** Package with ID: 21 has been added to route with ID: 2!

**Input:** ViewRoute RouteId

**Output:**

RouteID: 2

Route status: scheduled

Route locations: Alice Springs (16/02 Friday @ 06:00) → Melbourne 17/02 Saturday @ 07:00

Route distance: 2255 km

Route capacity: **10 184 kg**  **- >** **adds the new package’s weight to the current one**

Route start date: 16/02 Friday @ 06:00

Route final ETA: 17/02 Saturday @ 07:00

PackageID: **2, 6, 10, 11, 12, 21** **- >** **adds the new package’s id to the list of current ones**

TruckID: 1026

**Input:** UpdatePackage RouteId Eta

**Output:** Package with ID: 21 has been updated!

**Input:** ViewPackage PackageId

**Output:**

PackageID: 21

Package weight: 45 kg

Package start location: Alice Springs

Package end location: Melbourne

Package entry date: 09/02 Friday @ 11:30

Package final ETA: **17/02 Saturday @ 07:00**

Package status: **assigned**

RouteID: **2**

**Use case #2**

Many packages with total weight of 23000kg have gathered in the hub in Alice Springs and an employee of the company uses the system to create a route that leaves on Sep 12th 06:00h with the following stops:

Alice Springs → Adelaide → Melbourne → Sydney → Brisbane

The system determines the route distance to 4041km and calculates estimated arrival times for each of the locations based on a predefined average speed of 87km/h. The employee then finds a free truck that meets the required range and capacity and proceeds to bulk assign the packages to the newly created route by using the route id and the packages’ ids.

1. **There is NO route with those start and end points with an available truck assigned to it.**

**Input:** CreateCustomer paul2 paul\_jones@gmail.com Paul Jones

**Output:** Customer with username: paul2 has been created!

**Input:** CreatePackage Sydney Melbourne weight

**Output:** Package with ID: 22 has been created!

**Input:** ViewPackage IdPackage

**Output:**

PackageID: 22

Package weight: 45 kg

Package start location: Sydney

Package end location: Melbourne

Package entry date: 09/02 Friday @ 11:30

Package final ETA: **Package is still unassigned.**

Package status: **unassigned**

RouteID: **Package is still unassigned.**

**Input:** ShowRoute

**Output:**

RouteID: 1

Route status: scheduled **(open => scheduled => on route => arrived)**

Route locations: Perth (15/02 Thursday @ 06:00) → Melbourne 16/02 Friday @ 22:00

Route distance: 3509 km

Route capacity: 13 555 kg

Route start date: 15/02 Thursday @ 06:00

Route final ETA: 16/02 Friday @ 22:00

PackageID: 1, 5, 7, 8, 17, 15, 21

TruckID: 1011

===============

RouteID: 2

Route status: scheduled

Route locations: Alice Springs (16/02 Friday @ 06:00) → Melbourne 17/02 Saturday @ 07:00

Route distance: 2255 km

Route capacity: 10 139 kg

Route start date: 16/02 Friday @ 06:00

Route final ETA: 17/02 Saturday @ 07:00

PackageID: 2, 6, 10, 11, 12

TruckID: 1026

===============

RouteID: 3

Route status: scheduled

Route locations: Bristbane (17/02 Saturday @ 06:00) → Adelaide 18/02 Sunday @ 04:00

Route distance: 1927 km

Route capacity: 28 744 kg

Route start date: 17/02 Saturday @ 06:00

Route final ETA: 18/02 Sunday @ 04:00

PackageID: 2, 6, 10, 11, 12

TruckID: 1026

===============

**Input:** ShowHubs

**Output:**

Adelaide weight: 15 650 kg

Adelaide PackageID: 78, 98, 74, 26, 75, 59, 4

===============

Melbourne weight: 21 788 kg

Melbourne PackageID: 78, 98, 74, 26, 75, 59, 4, 94, 26, 85, 49, 7

===============

Sydney weight: 10 101 kg

Sydney PackageID: 26, 75, 59, 4, 94, 26, 85, 49, 7

===============

Bristbane weight: 7 850 kg

Bristbane PackageID: 98, 74, 26, 75,

===============

Alice Springs weight: 30 945 kg

Alice Springs PackageID: 26, 85, 49, 7, 26, 75, 59, 4, 94, 26, 85, 49, 7

===============

Darwin weight: 39 466 kg

Darwin PackageID: 26, 85, 49, 7, 26, 75, 59, 4, 94, 26, 85, 49, 7

===============

Perth weight: 17 523 kg

Perth PackageID: 26, 75, 59, 4, 94, 26, 85, 49, 7

**Input:** CreateRoute Alice Springs Adelaide Sydney Melbourne Brisbane

**Output:**

RouteID: 25

Route status: **open - >** **default message – changes when packages assigned to route, and depends on the current date**

Route locations: Alice Spring (10/02 Saturday @ 06:00) → Adelaide (10/02 Saturday @ 20:00) → Sydney (11/02 Sunday @ 18:00) -> Melbourne (12/02 Monday @ 14:00) -> Brisbane (13/02 Tuesday @ 14:00)

Route distance: 4041 km

Route capacity: **Capacity is still uncalculated. - >** **default message – changes when packages assigned to route from hub**

Route start date: 10/02 Saturday @ 06:00

Route final ETA: 13/02 Tuesday @ 14:00

PackageID: **Package is still unassigned. - >** **default message – changes when packages assigned to route from hub**

TruckID: **Truck is still unassigned. - >** **default message – changes validation passes route capacity < truck capacity; route distance < truck max range, truck availability between route start date and route final ETA**

**Input:** ShowTrucks

**Output:**

TruckID: 1007

Truck max capacity: 42 000 kg

Truck max range: 8 000 km

Truck status: available

Truck complete availability after: 16/02 Friday @ 06:00 - 17/02 Saturday @ 07:00

===============

TruckID: 1012

Truck capacity: 37 000 kg

Truck max range: 10 000 km

Truck status: available

Truck complete availability after: 16/02 Friday @ 06:00 - 17/02 Saturday @ 07:00

===============

TruckID: 1028

Truck capacity: 26 000 kg

Truck max range: 13 000 km

Truck status: available

Truck complete availability after: 16/02 Friday @ 06:00 - 17/02 Saturday @ 07:00

===============

**Input:** AddTruckToRoute RouteId TruckId weight

**Output:** Truck with ID: 1007 has been added to route with ID: 25!

**Input:** ViewRoute RouteId

**Output:**

RouteID: 25

Route status: **scheduled**

Route locations: Alice Spring (10/02 Saturday @ 06:00) → Adelaide (10/02 Saturday @ 20:00) → Sydney (11/02 Sunday @ 18:00) -> Melbourne (12/02 Monday @ 14:00) -> Brisbane (13/02 Tuesday @ 14:00)

Route distance: 4041 km

Route capacity: 30 945 kg

Route start date: 10/02 Saturday @ 06:00

Route final ETA: 13/02 Tuesday @ 14:00

PackageID: **26, 85, 49, 7, 26, 75, 59, 4, 94, 26, 85, 49, 7**

TruckID: **1007**

**Input:** AddPackageToRoute RouteId PackageId weight

**Output:** Package with ID: 21 has been added to route with ID: 25!

**Input:** ViewRoute RouteId

**Output:**

RouteID: 25

Route status: scheduled

Route locations: Alice Spring (10/02 Saturday @ 06:00) → Adelaide (10/02 Saturday @ 20:00) → Sydney (11/02 Sunday @ 18:00) -> Melbourne (12/02 Monday @ 14:00) -> Brisbane (13/02 Tuesday @ 14:00)

Route distance: 4041 km

Route capacity: **30 990 kg**

Route start date: 10/02 Saturday @ 06:00

Route final ETA: 13/02 Tuesday @ 14:00

PackageID: **26, 85, 49, 7, 26, 75, 59, 4, 94, 26, 85, 49, 7, 21**

TruckID: 1007

**Input:** UpdatePackage RouteId TruckId Eta

**Output:** Package with ID: 21 has been updated!

**Input:** ViewPackage PackageId

**Output:**

PackageID: 22

Package weight: 45 kg

Package start location: Sydney

Package end location: Melbourne

Package entry date: 09/02 Friday @ 11:30

Package final ETA: **13/02 Tuesday @ 14:00**

Package status: **assigned**

RouteID: **25**

**Use case #3:**

A manager at the company uses the system to find information about all delivery routes in progress. The system responds with information that contains each route’s stops, delivery weight, and the expected current stop based on the time of the day.

**Input:** ViewRoutes OnRoute

**Output:**

RouteID: 1

Route status: on route **(open => scheduled => on route => arrived)**

Route locations: Perth (15/02 Thursday @ 06:00) → Melbourne 16/02 Friday @ 22:00

Route distance: 3509 km

Route capacity: 13 555 kg

Route start date: 15/02 Thursday @ 06:00

Route final ETA: 16/02 Friday @ 22:00

Route current ETA: 16/02 Friday @ 22:00

===============

RouteID: 2

Route status: on route

Route locations: Alice Springs (16/02 Friday @ 06:00) → Melbourne 17/02 Saturday @ 07:00

Route distance: 2255 km

Route capacity: 10 139 kg

Route start date: 16/02 Friday @ 06:00

Route final ETA: 17/02 Saturday @ 07:00

Route current ETA: 17/02 Saturday @ 07:00

===============

RouteID: 3

Route status: scheduled

Route locations: Bristbane (17/02 Saturday @ 06:00) → Adelaide 18/02 Sunday @ 04:00

Route distance: 1927 km

Route capacity: 28 744 kg

Route start date: 17/02 Saturday @ 06:00

Route final ETA: 18/02 Sunday @ 04:00

Route current ETA: 18/02 Sunday @ 04:00

===============

**Use case #4:**

A supervising employee uses the system to view information about each package that is not yet assigned to a delivery route. The system responds with a list of packages containing their IDs and locations

**Input:** ViewPackage Unassigned

**Output:**

PackageID: 22

Package start location: Sydney

===============

PackageID: 15

Package start location: Melbourne

===============

PackageID: 2

Package start location: Alice Springs

===============

## **Use case #5:**

A customer contacts the office to request information about their package. The customer provides the id that they received when the package was created, and an employee enters the package id in the system. It responds with detailed information which is then emailed to the customer.

**Input:** ViewPackage PackageId

**Output:**

PackageID: 21

Package user: steven1

Package start location: Alice Springs

Package end location: Melbourne

Package entry date: 09/02 Friday @ 11:30

Package final ETA: 17/02 Saturday @ 07:00

Package status: assigned

RouteID: 2

**Input:** EmailPackage PackageId PackaageStartLocation TruckId RouteId PackageEndLocation PackageFinalETA

**Output:**

Dear Customer,

Please, find below information containing a requested update regarding package with ID: 21.

The package has been assigned from Alice Springs to truck with ID: 1026.

The truck will leave on route with ID: 2, from Alice Springs, 16/02 Friday @ 06:00.

The package’s final time of arrival is in Melbourne, 17/02 Saturday @ 07:00.

If there are any further queries, we remain available.

Best regards,

Customer Support

***Input:***

CreateCustomer paul2 paul\_jones@gmail.com Paul Jones

CreateCustomer paul2 paul\_jones@gmail.com Paul Jones

***Output:***

Customer with username: paul2 has been created!

Customer with paul2 already exists!