



User Manual

Paradiso Application

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Revision Sheet

Release No.	Date	Revision Description
Rev. 0	04/11/2019	User Manual
Rev. 1	04/25/2019	User Manual – Alpha Release (Some application features is removed, getting started and installation sections are updated, back matter is added)
Rev. 2	05/09/2019	User Manual – Beta Release (Installation and application features has changed, getting started is updated based on new GUI, errors are added in back matter)
Rev. 3	05/24/2019	User Manual – Beta Release V2.0 (Main Menu, next order and order number are added to Getting Started, Error messages is updated based on new features.)
Rev. 4	06/06/2019	User Manual – Final Release (Fix Beta release issues (fix branch and bound algorithm, add previous step button, show direction in GUI, add secure sign in), change installation and getting started, update error messages)

Table of Contents

Table of Contents	4
Table of Figures	5
Table of Tables	6
1. Introduction	7
2. Installation	8
2.1. System Requirement	8
2.2. How to install	8
2.2.1. Install application	8
3. Application features	9
3.1. Best routing for a list of items	9
3.2. Consistency	9
3.3. Graphical map	9
3.4. Secure sign in	9
4. Getting started	10
4.1. Main Menu	10
4.2. Insert start point	14
4.3. Insert end point	17
4.4. Add item	18
4.4.1. Manually	19
4.4.2. Order Number	21
4.4.3. Next Order	24
4.5. Go to the item	25
4.6. Go Back	29
4.7. Reset	33
5. Back Matter	35
5.1. Copyright	35
5.2. Error Messages	35

Table of Figures

<i>Figure 1. Main Menu</i>	10
<i>Figure 2. Sign Up</i>	11
<i>Figure 3. Sign up message</i>	12
<i>Figure 4. Sign In</i>	12
<i>Figure 5. Sign in message</i>	13
<i>Figure 6. Help</i>	13
<i>Figure 7. Insert start point</i>	14
<i>Figure 8. Invalid location (location on shelves)</i>	15
<i>Figure 9. Invalid location (location out of range)</i>	16
<i>Figure 10. Invalid location (negative number, letter, symbol)</i>	17
<i>Figure 11. Insert end point</i>	18
<i>Figure 12. Please select a method.</i>	19
<i>Figure 13. Add an unavailable product</i>	20
<i>Figure 14. Add an available product</i>	21
<i>Figure 15. Order is already picked.</i>	22
<i>Figure 16. Order number out of range.</i>	23
<i>Figure 17. Finding specific order number</i>	24
<i>Figure 18. Next order</i>	25
<i>Figure 19. The route from start point to first item after clicking "Go to first item"</i>	26
<i>Figure 20. Next part of the route</i>	27
<i>Figure 21. Next part of the route</i>	28
<i>Figure 22. The best route to end point</i>	29
<i>Figure 23. Disabled "Go Back" button</i>	30
<i>Figure 24. Go to first item</i>	31
<i>Figure 25. Go to next item</i>	32
<i>Figure 26. Go to previous item</i>	33
<i>Figure 27. Reset Button</i>	34

Table of Tables

Table 1 Error Messages

35

1. Introduction

Nowadays cities are getting bigger and bigger and you can obviously see the influence of routing applications on human's lives. People may use these applications for different purposes, they want to know if there exists any traffic, they don't know the route or simply they want to recognize when they are going to reach to their destination. But one purpose is the same, they all want to find the fastest route. But what if you are in the big warehouse of a company? How you will find your routes? That's the place you are going to use our product. Paradiso helps you to find the fastest route without wasting your time. You can have it on your laptops or personal computers.

As an owner of a company having a warehouse either big or small, you should be aware of problems existing in that. One of the most common hardships of working in a warehouse is memorizing the location of each object to reach them in a small amount of time. Due to the huge number of products and maybe changing the locations of them, it is actually impossible for workers to memorize them. Paradiso will help the workers to find the locations of product and fastest way to achieve it.

2. Installation

2.1. System Requirement

The application needs windows 7 and higher or Linux 13 and later or Mac OS version Yosemite and higher. Any Intel or AMD x86-64 processor is good. Also, at least 2GB of RAM is required but we recommend 4GB of RAM. The application needs about 1 GB free space of any hard drive of the computer but SSD will increase its performance. No specific graphics card required.

The application also needs Internet Access to Sign In/Sign Up.

2.2. How to install

2.2.1. Install application

After you saved the setup files of your application on your computer, you must go the directory in which you installed the files and unzip the zip file. In the folder there a file named main.exe and you can open the application by running the file. Just make sure that two text files 'qvBox-warehouse-data-s19-v01.txt' and 'DistMat.npy' are in the same directory as the main.exe file. You can find these instructions in 'README.txt', too.

3. Application features

3.1. Best routing for a list of items

The application provides the best route to the desired item in the warehouse. It not only considers the entrance and exit location of the warehouse but also it suggests the best route including all items in the order list.

3.2. Consistency

The suggested route to a single item is the same unless there is any hazard or collision in the route. In this case, the application reroutes to find the alternative best route.

3.3. Graphical map

User-friendly interface is another merit of this application. A graphical user interface is provided to the user which includes a map of the warehouse, the selected items locations, and the best route to the items.

3.4. Secure sign in

At first, a user-friendly interface will help you to register for the application. Then by signing in, you can easily start the application and use its features.

4. Getting started

4.1. Main Menu

When you start the program, main menu will be shown as below:

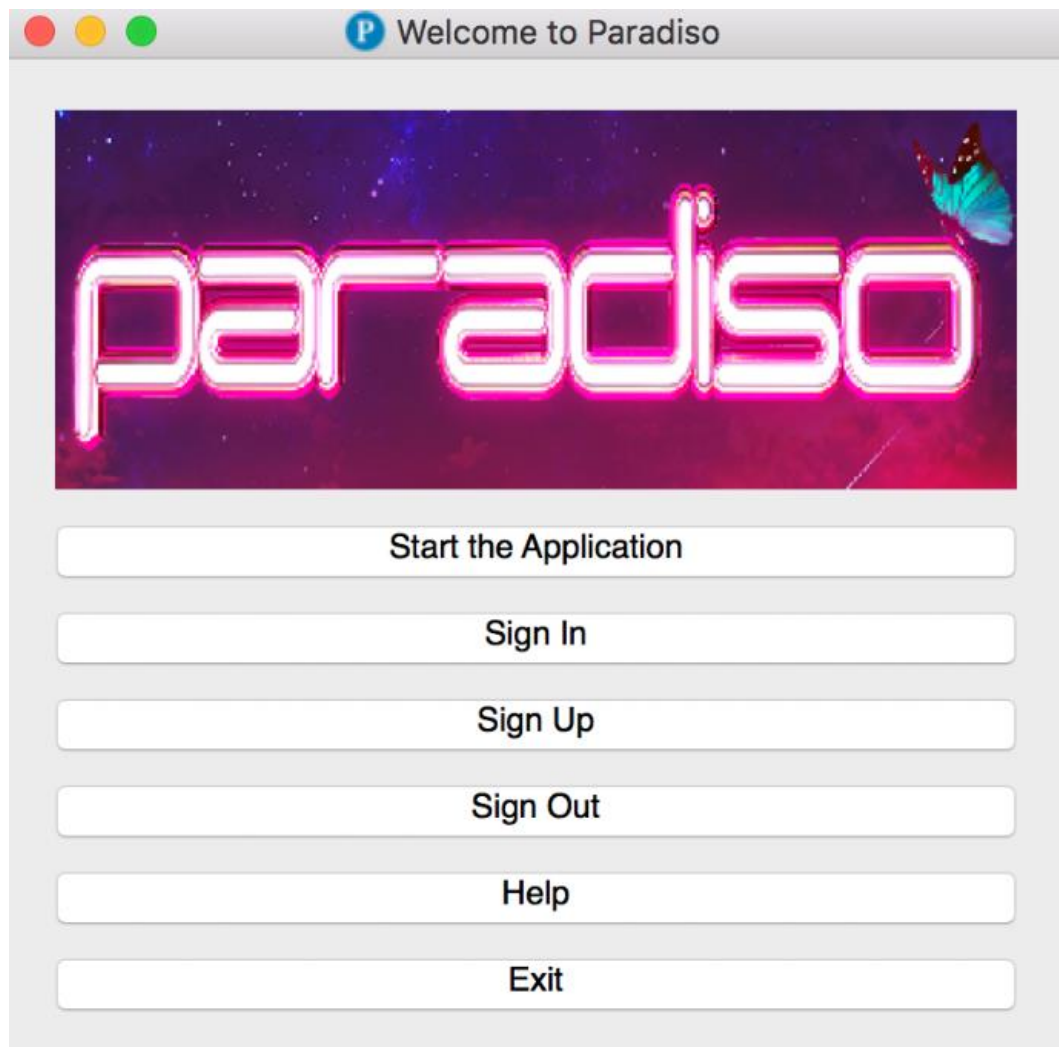


Figure 1. Main Menu

First you have to Sign Up to use the application. By clicking to the Sign Up button, the next window will pop up:



Name

Family Name

Email

USERNAME

PASSWORD

Repeat PASSWORD

Sign Up

Figure 2. Sign Up

In this window you have to enter your information and USERNAME and PASSWORD for sign in to the application. After you successfully Signed up to the application, the next figure will be pop up:

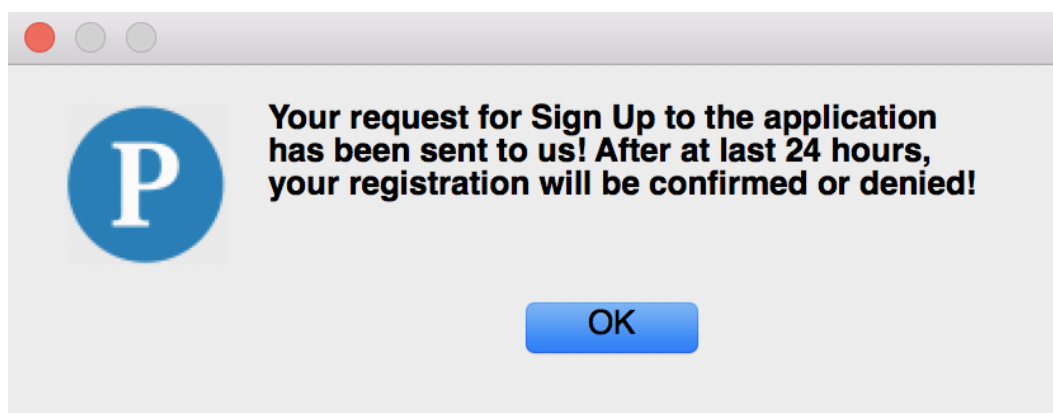


Figure 3. Sign up message

The email will be sent to us containing your information. If you are eligible to Sign Up to the application, we enter your information in the server within 24 hours and email you that your registration is approved. As a result, you can Sign in to the application after your registration is approved. By clicking to the Sign in button, the next window will pop up:

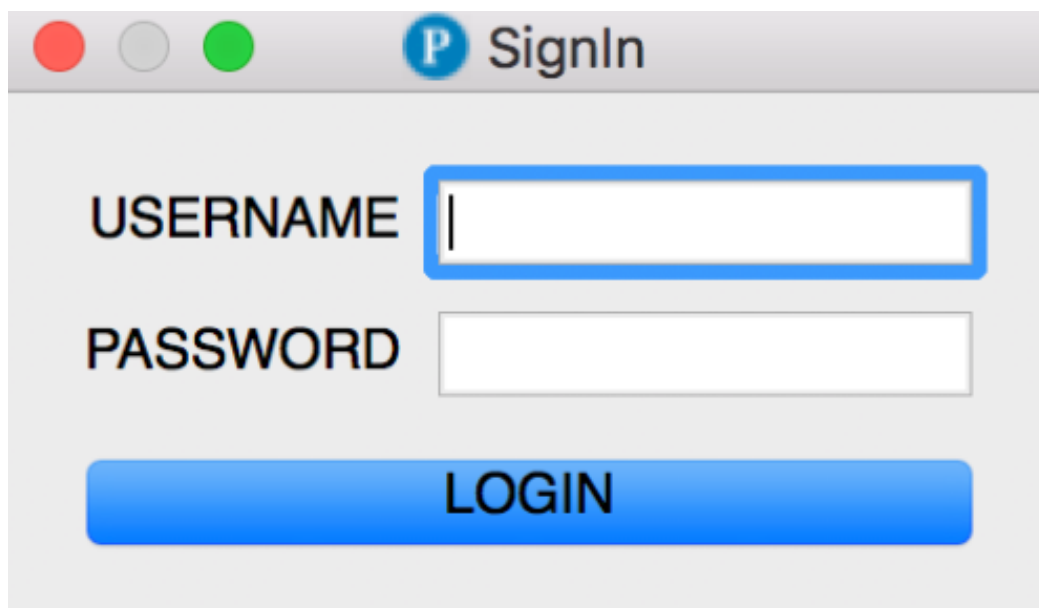


Figure 4. Sign In

After you are successfully signed in to the application, the next figure will be pop up:

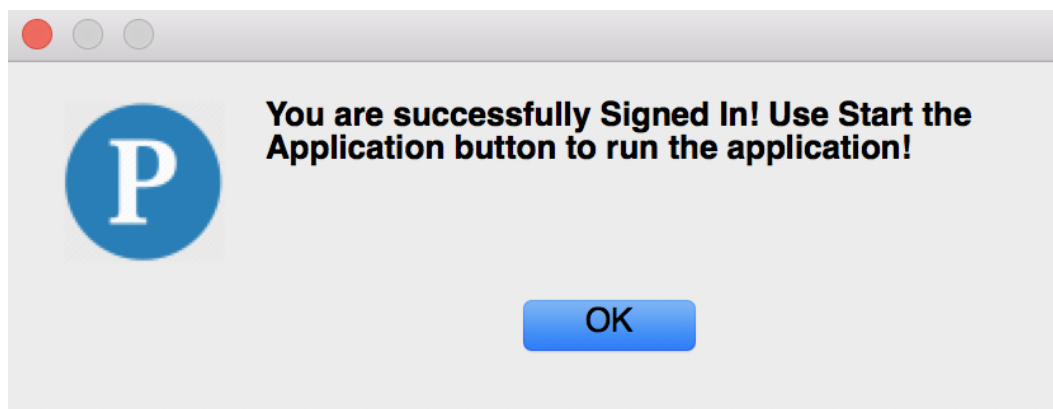


Figure 5. Sign in message

You can use Start the application button to run the application.

By clicking to the Sign Out button, you can successfully sign out from the application.

By clicking to the Help button, you can have some information about how to run the application as below:



Figure 6. Help

4.2. Insert start point

You should specify the start point by writing the row and column of it in the corresponding boxes. In the next step, if you click the *Set* button, the start point will be shown on the map with blue color and letter 'S' and accordingly the start point coordinates will be written in dialog box.

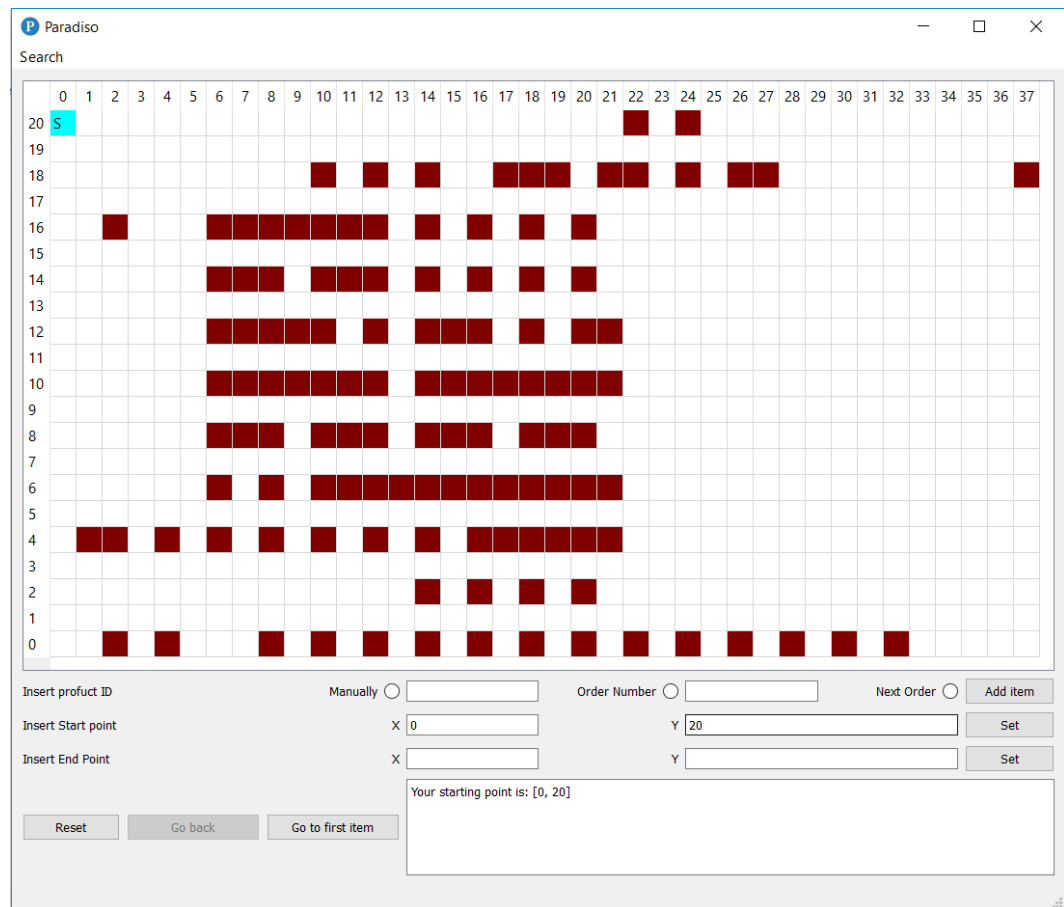


Figure 7. Insert start point

For inserting the start point, you may enter coordinates of a shelf. Paradiso will show an error message in the dialog box to notify you that the point you entered is not valid.

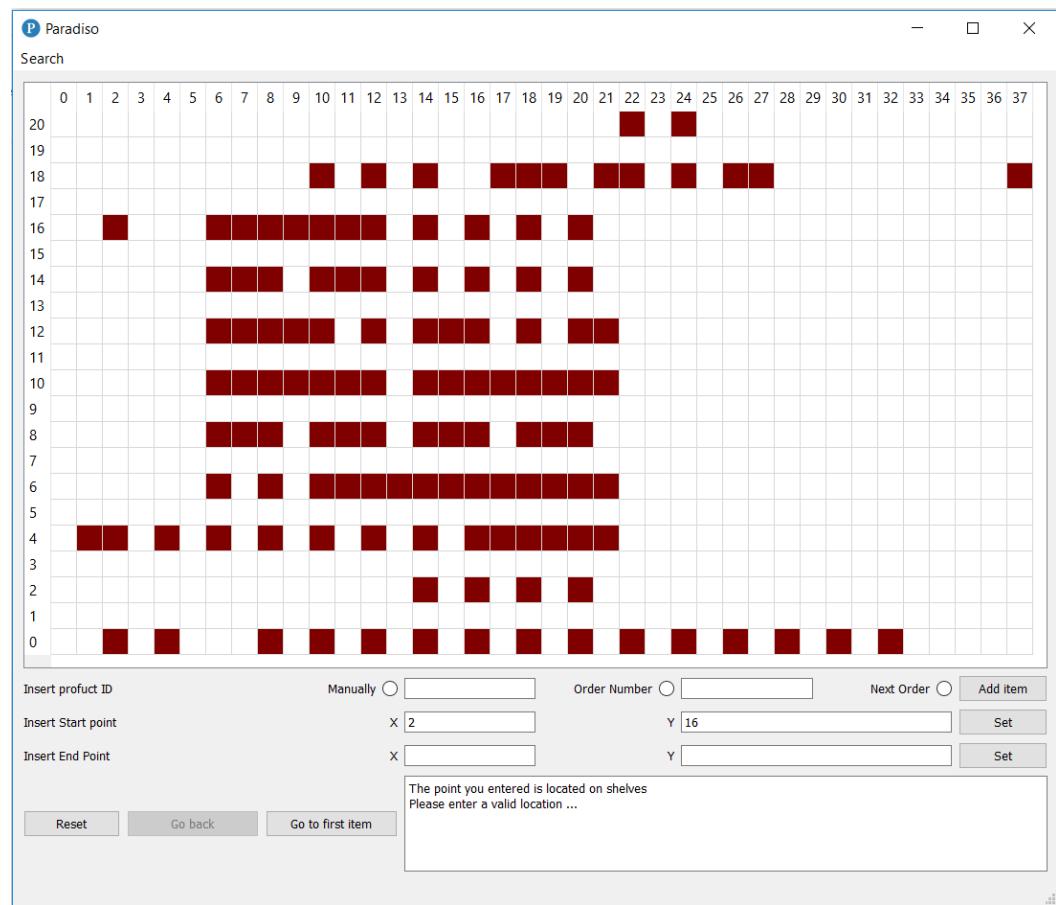


Figure 8. Invalid location (location on shelves)

There exists another error that you may enter a point out of range. If you enter a point with this feature the error will be shown in the dialog box.

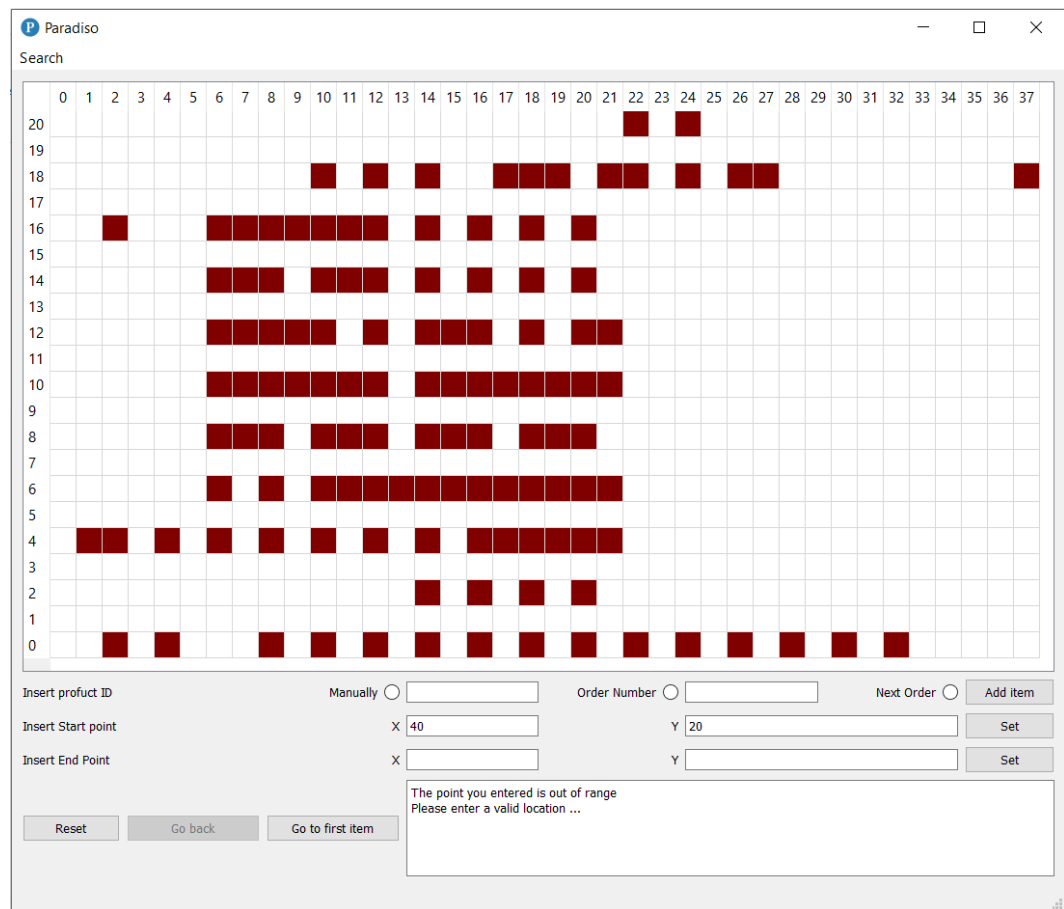


Figure 9. Invalid location (location out of range)

You may also enter a negative number, letters or symbols. When you are going to set these start points you can see error in the dialog box.

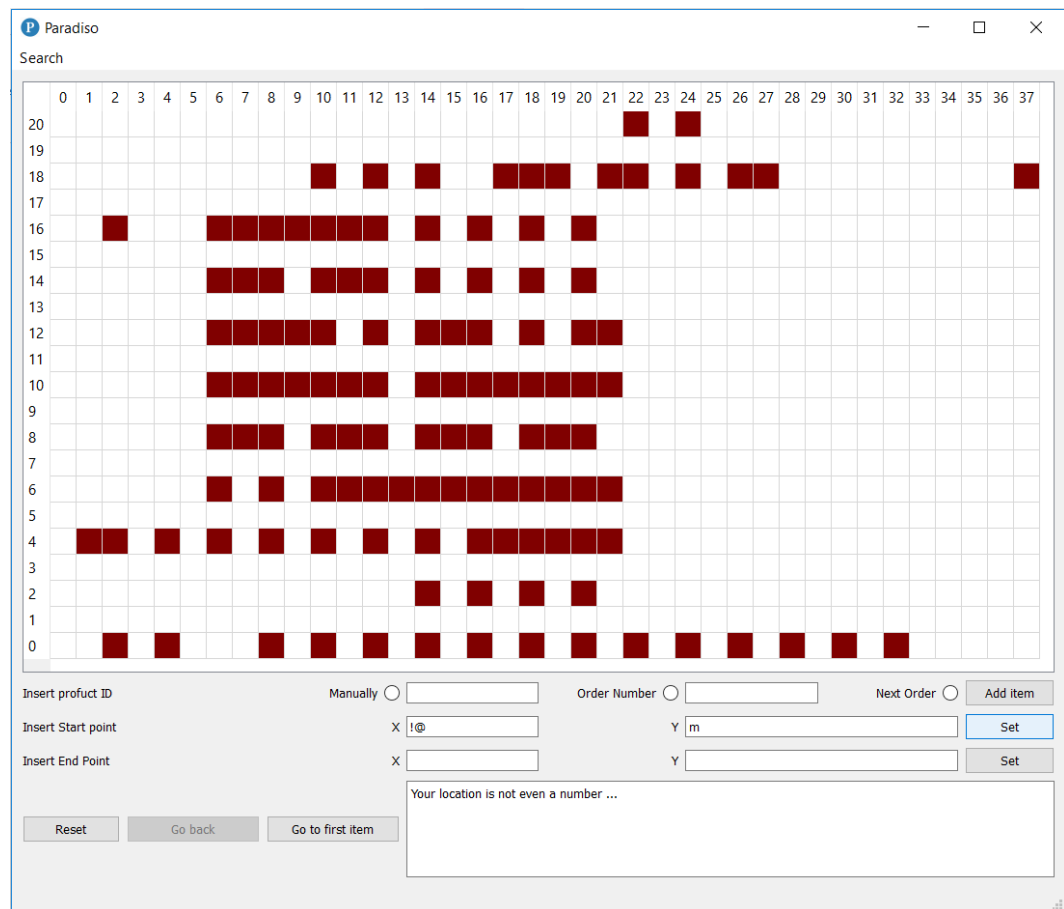


Figure 10. Invalid location (negative number, letter, symbol)

4.3. Insert end point

You should specify the end point by writing the row and column of it in the corresponding boxes. In the next step, if you click the Set button, the end point will be shown on the map with blue color and letter 'E' and accordingly the end point will be written in dialog box.

Two errors (location on the shelf and location out of range) mentioned above in section 4.1 “Insert start point”, are handled for end point, too.

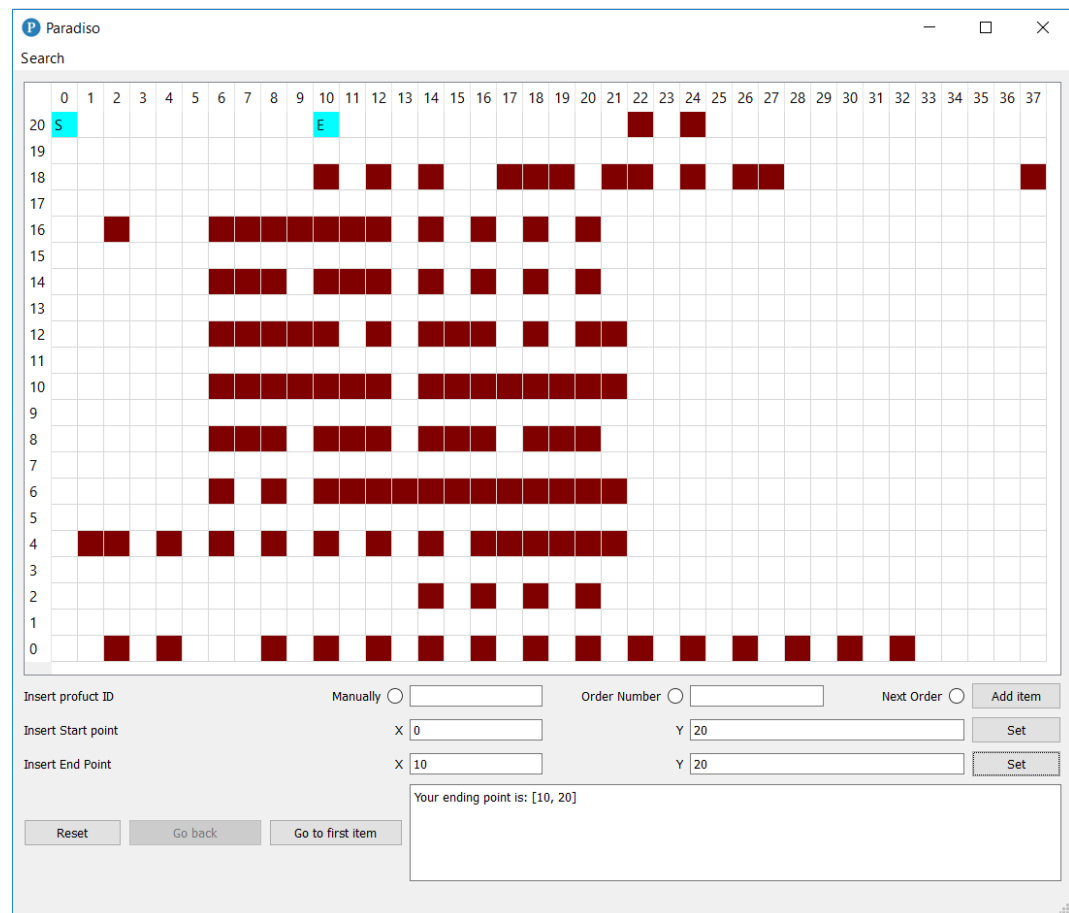


Figure 11. Insert end point

4.4. Add item

You can see three button “Manually, Order Number and Next Order” in the application. In each search you can just pick one of them. The remaining part of this section explains what the activities of each of these buttons are. If you don’t select any of them and you click on Add item the error below will occur. When you start writing on one of the text boxes, the button assigned for them will automatically be selected.

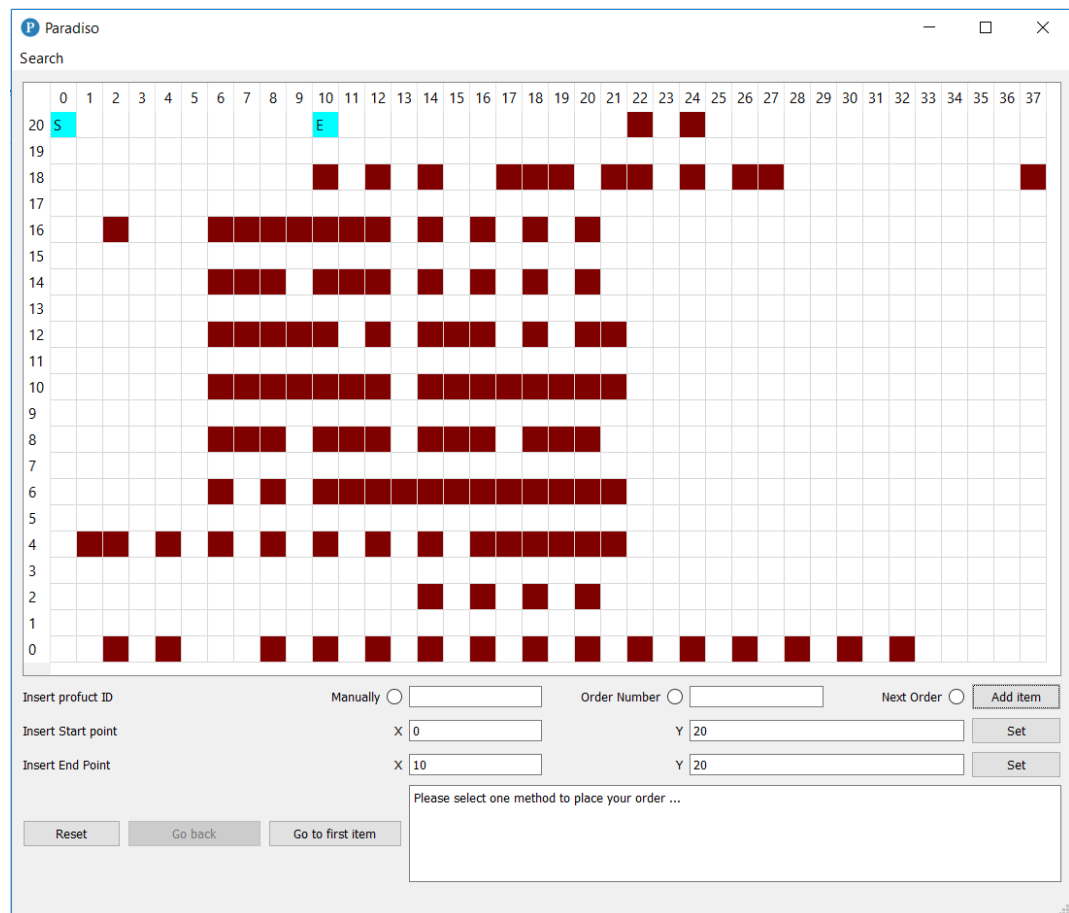


Figure 12. Please select a method.

4.4.1. Manually

Each product has a unique ID which can be called with and you can search in the warehouse database to check if an item is available and where it is located in the warehouse. For this purpose, you should enter the product ID in the corresponding box and click “Add item” button. If the product is not available, you can the following message in the dialog box:

“The product you enter is not valid. Please enter a valid product Id ... “

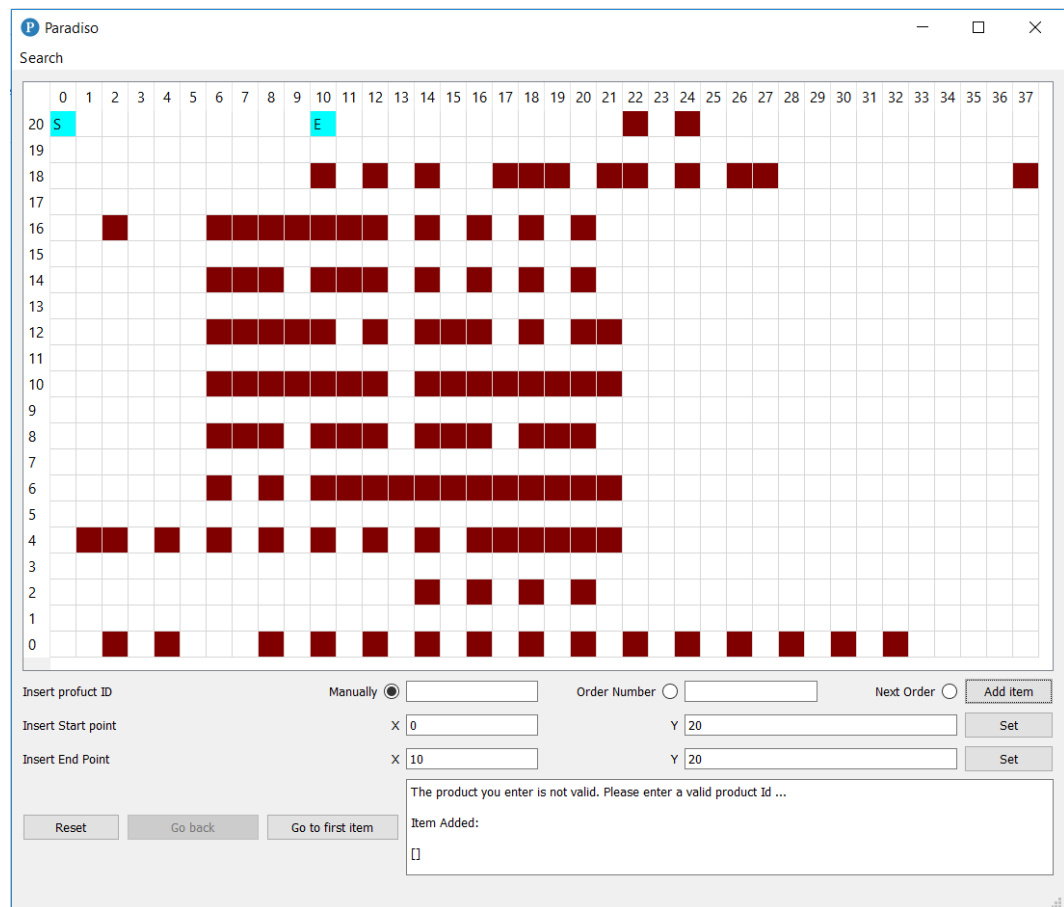


Figure 13. Add an unavailable product

Otherwise, its location will be shown with yellow color and letter 'P' on the map and also, product's coordinates will be in the dialog box.

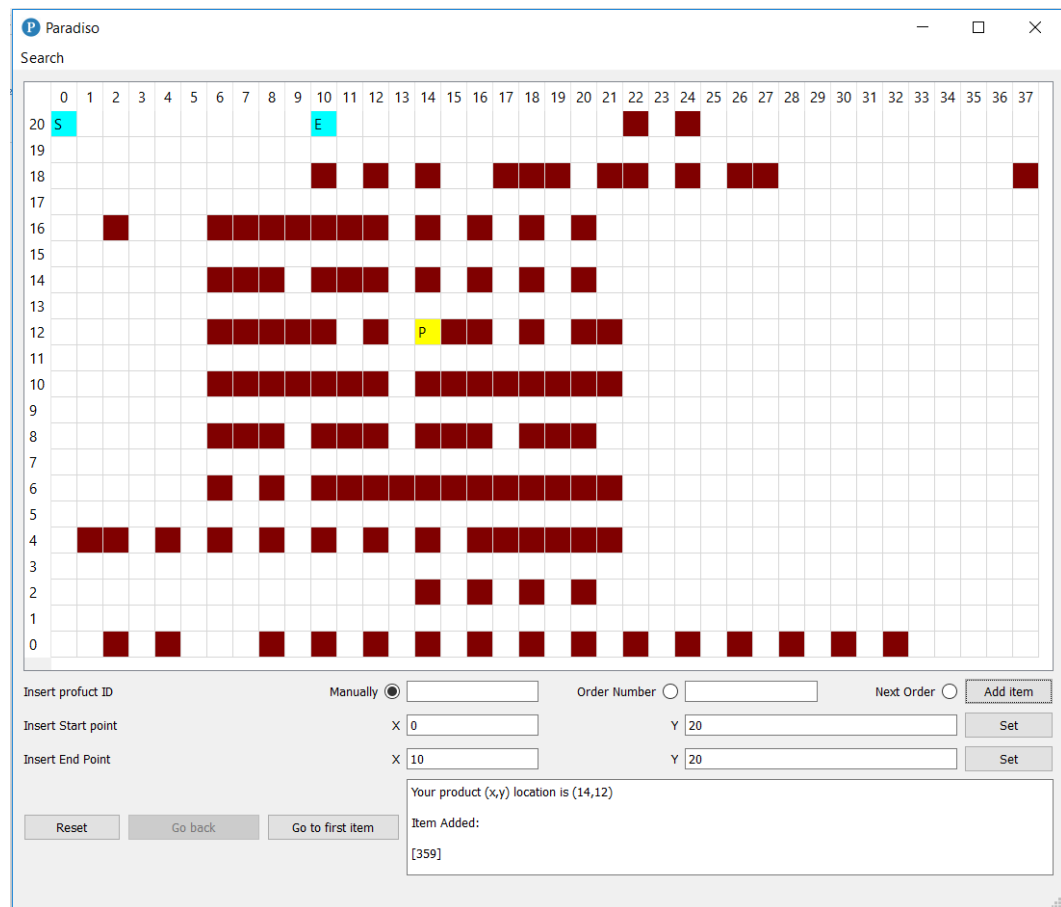


Figure 14. Add an available product

You can add as many products as you want (up to 15) one by one. You will see all the products you entered in the map. Also, the dialog box will show you the list of IDs you add until now.

4.4.2. Order Number

In the file uploaded for as input, there are several orders. One way to reach these items, is by entering the order number. If order number is already picked, you will see the figure below.

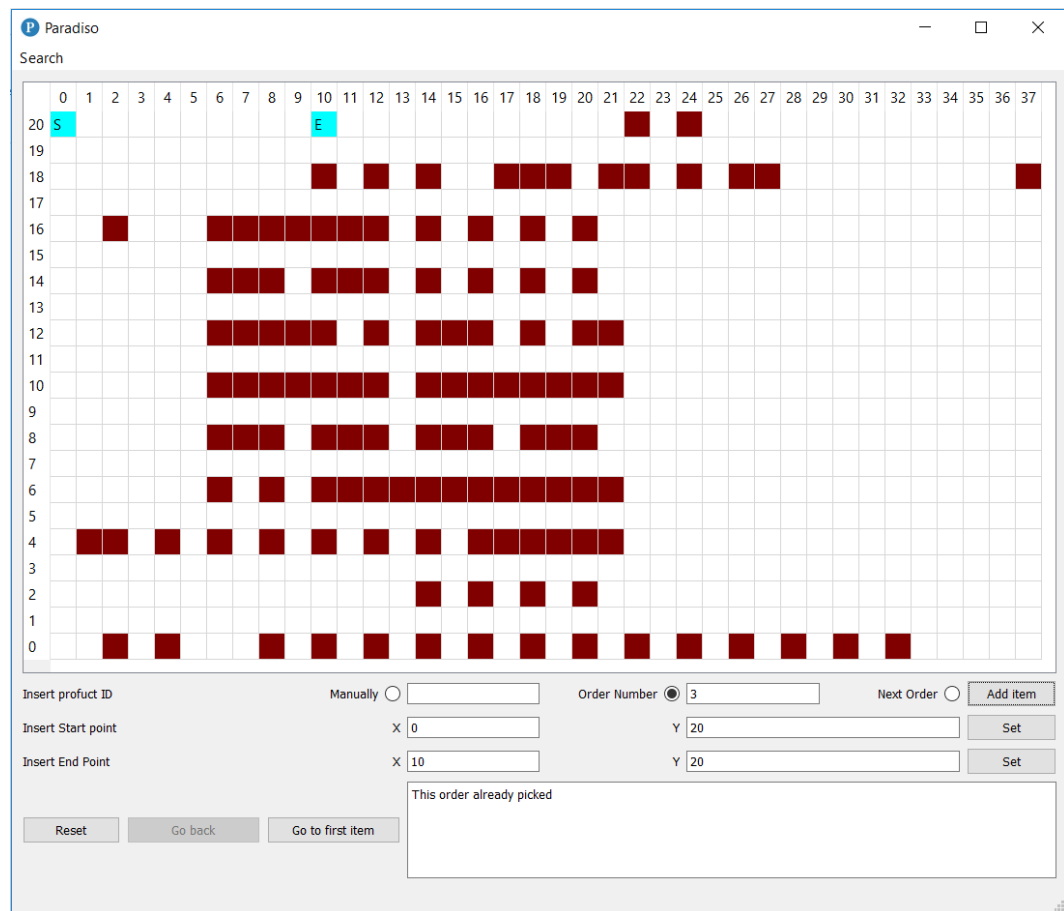


Figure 15. Order is already picked.

Also, if you enter an order number which is not in the range of existing orders, you will encounter the figure below.

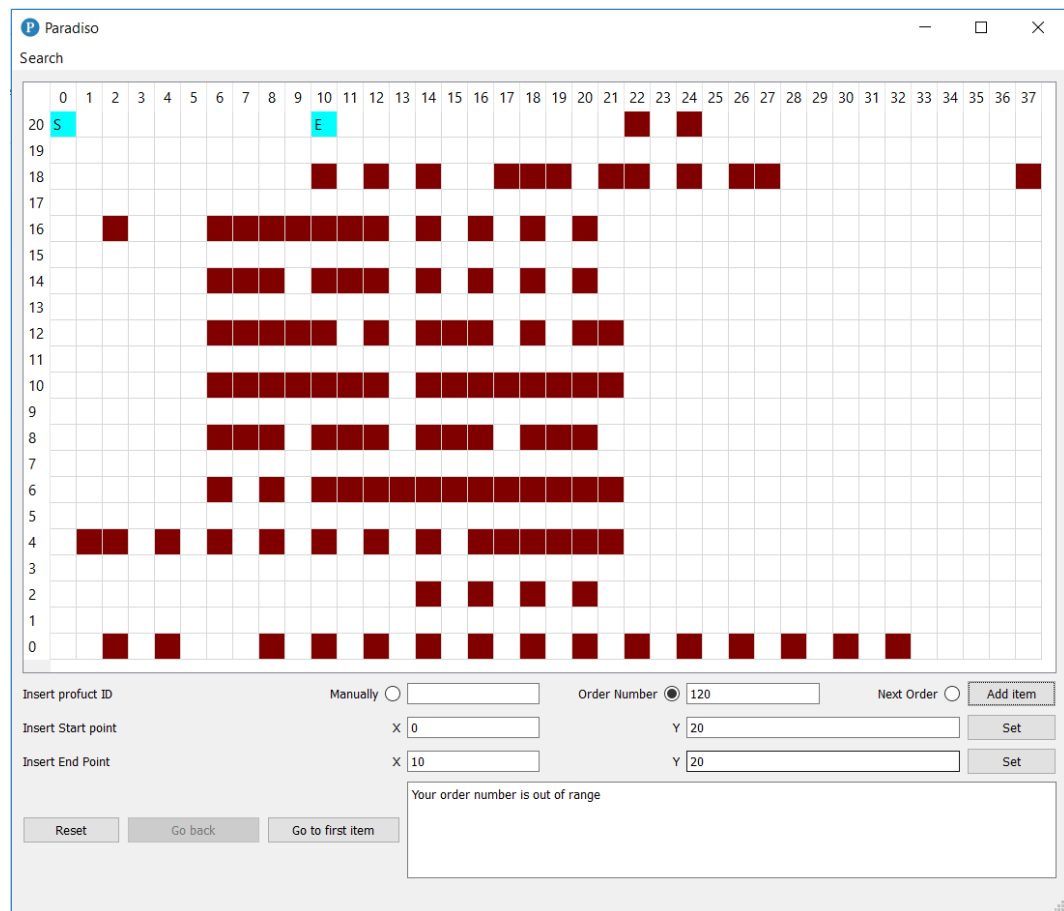


Figure 16. Order number out of range.

If you enter this number carefully, by clicking the “Add item” button, there will be no error. Also, you can see the products of your order on the map.

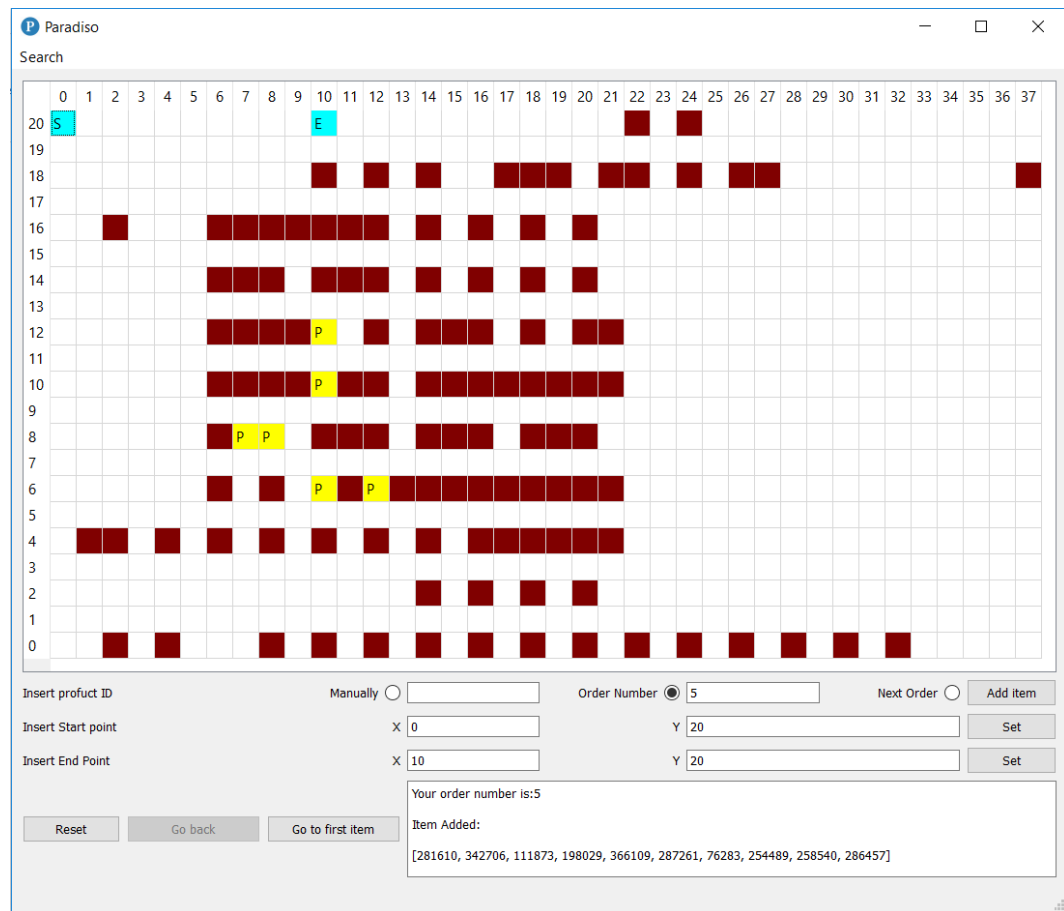


Figure 17. Finding specific order number

4.4.3. Next Order

In the file uploaded for as input, there is a sequence of visited orders. By selecting this button and clicking on “Add item”, you can see the next non-visited order.

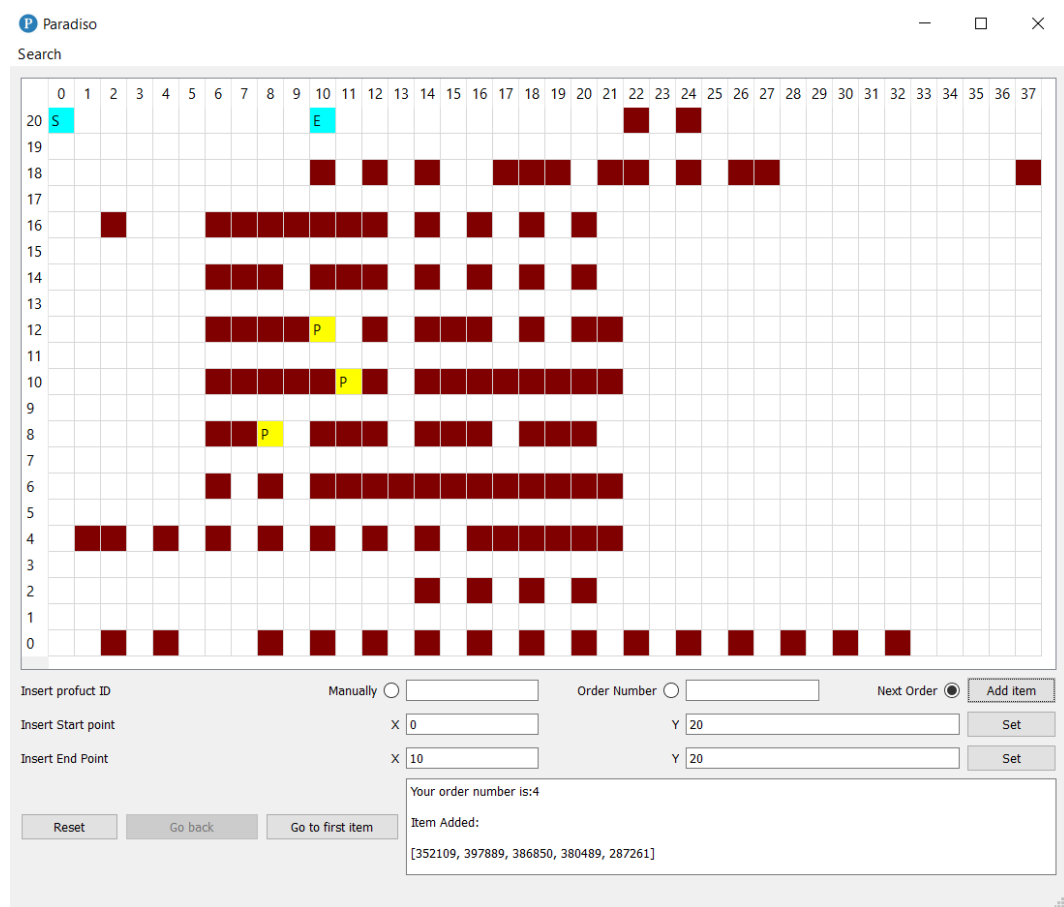


Figure 18. Next order

4.5. Go to the item

The application provides the best route to the desired list of products. After specifying the method of choosing product and its required data, start point, and end point, if you click on the “Go to first Item” button and the best route from start point to the first product in the fastest route will be shown on map with light green color. Step by step you will go to all products. Then, the path will lead you to the end point. After finding the best route of each order, it is necessary to click on reset button which is explained in section 4.7.

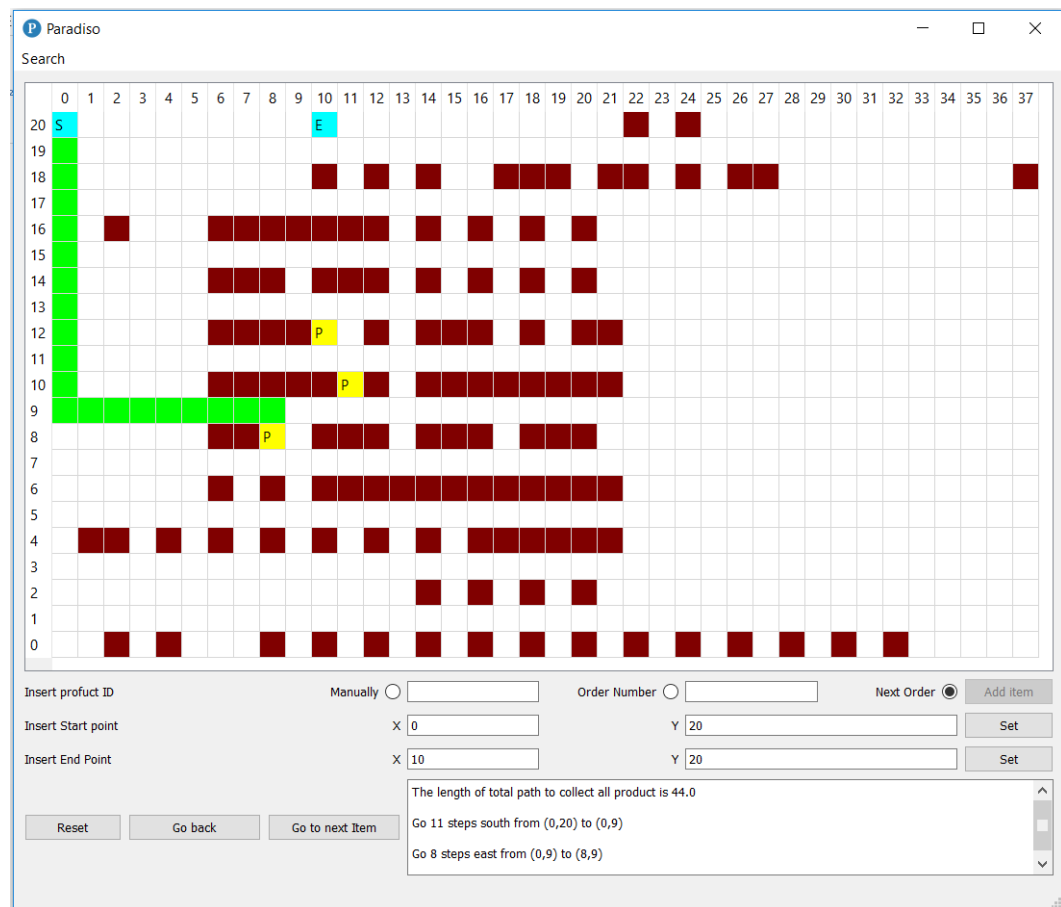


Figure 19. The route from start point to first item after clicking “Go to first item”

In figure 19, you can see the route from start point to the first product in the fastest route. As you can see, the route is also shown in the text box.

Then you will click on the “Go to next Item”. The route to the next item will be shown in the light green line will appear on the map and you can see it in the text box. You can see this in figure 20.

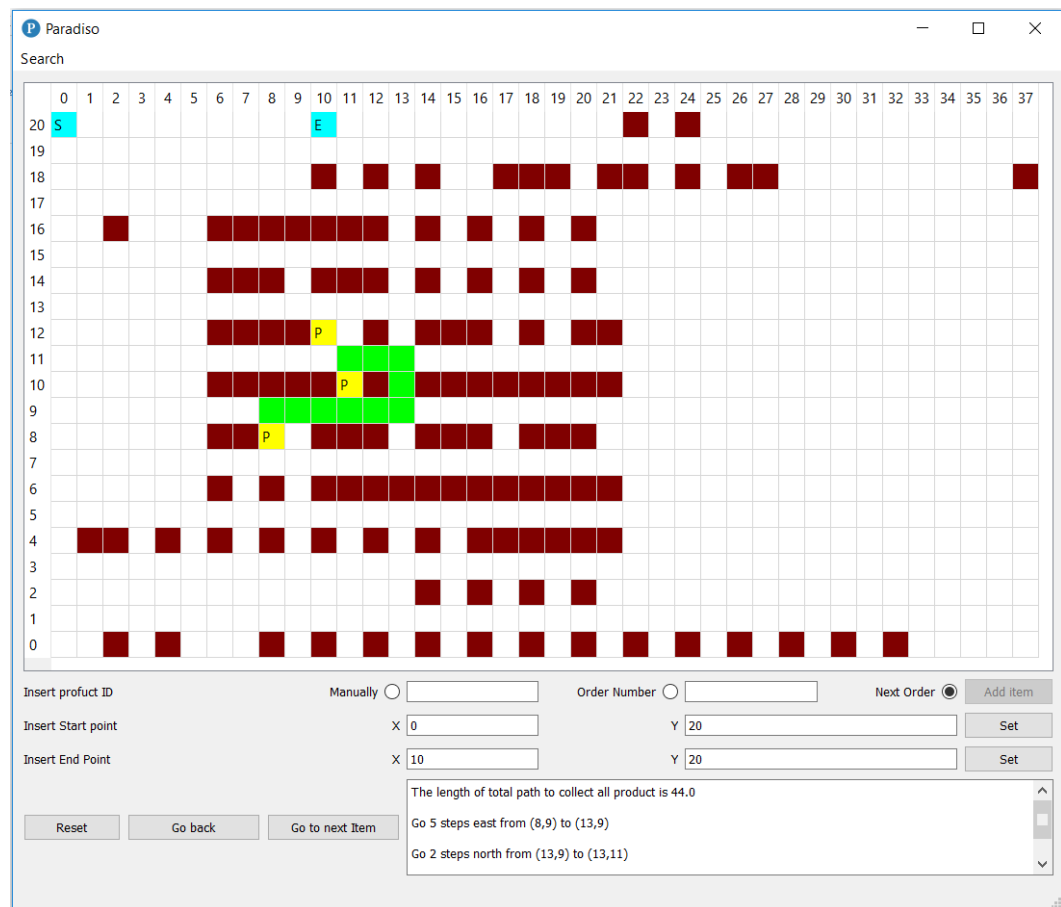


Figure 20. Next part of the route

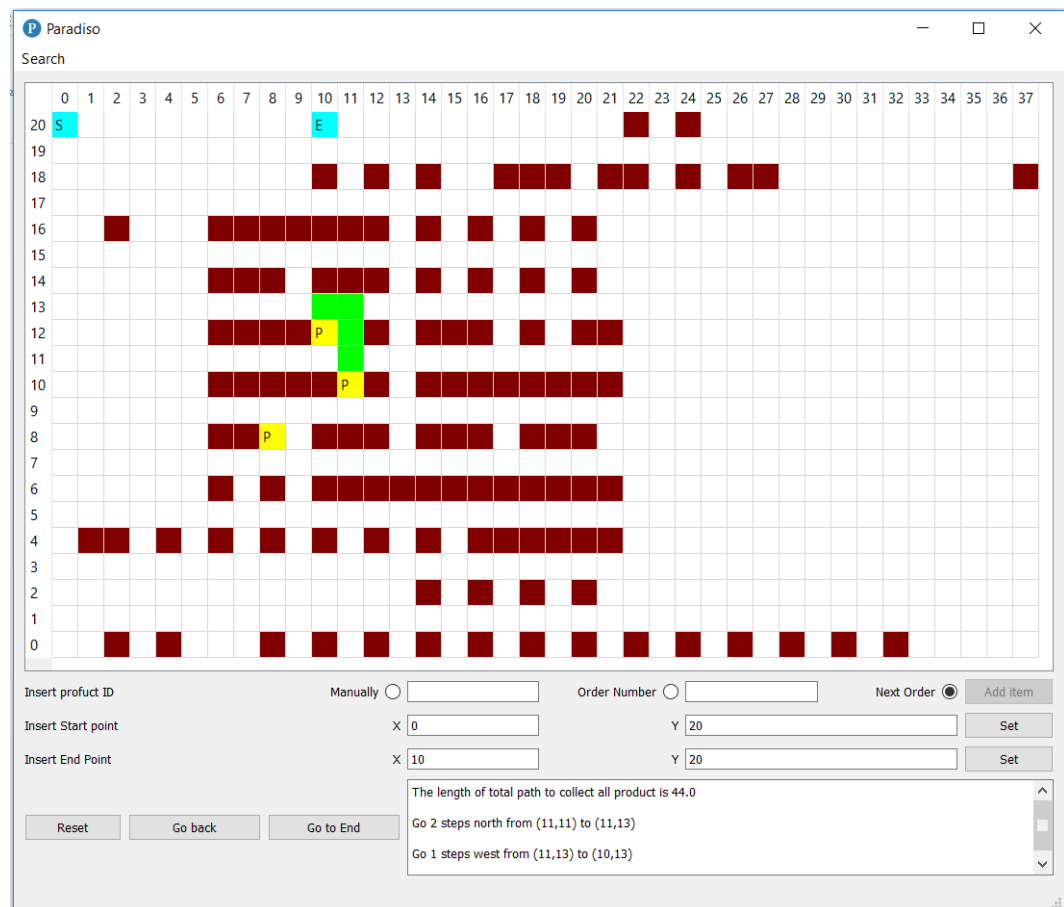


Figure 21. Next part of the route

Now, you have taken all the products and you can go to the end point. By clicking “Go to End” button the best route will appear on the map and text box. Then, you can see in the figure 22, the “Go to End” button will be disabled. That means you reach the end of the route. Now, there are two options that you can do. First, clicking on “Go Back” button to go to your previous step of the route. Second, clicking on “Reset” button. You can find further information in sections 4.6 and 4.7 respectively.



4.6. Go Back

There is a “Go Back” button which you can use to go to the previous step of application. At first, since you don’t have any previous step, this button is disabled. You can see figure 23.

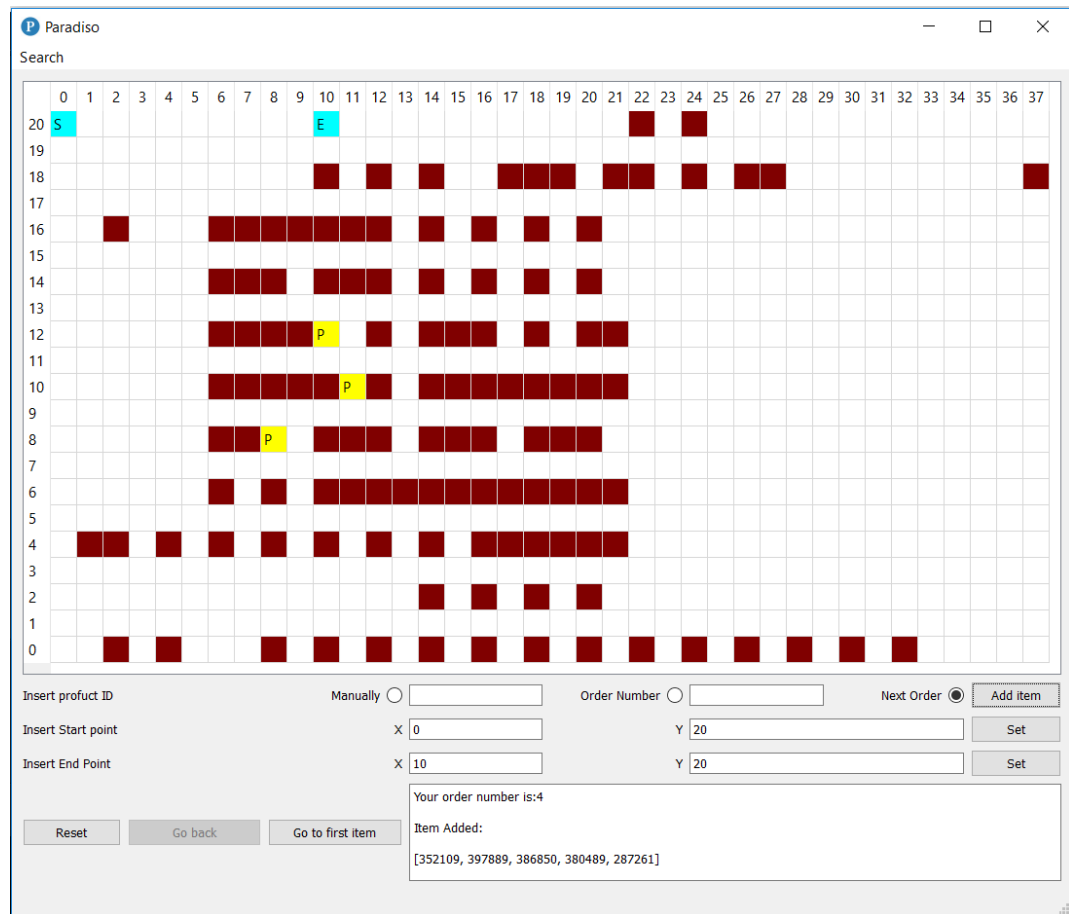


Figure 23. Disabled "Go Back" button

Then, by clicking “Go to first item”, “Go Back” button will be enabled and you can use it to go to previous step. See figures 24 through 26 to understand the function of this button.

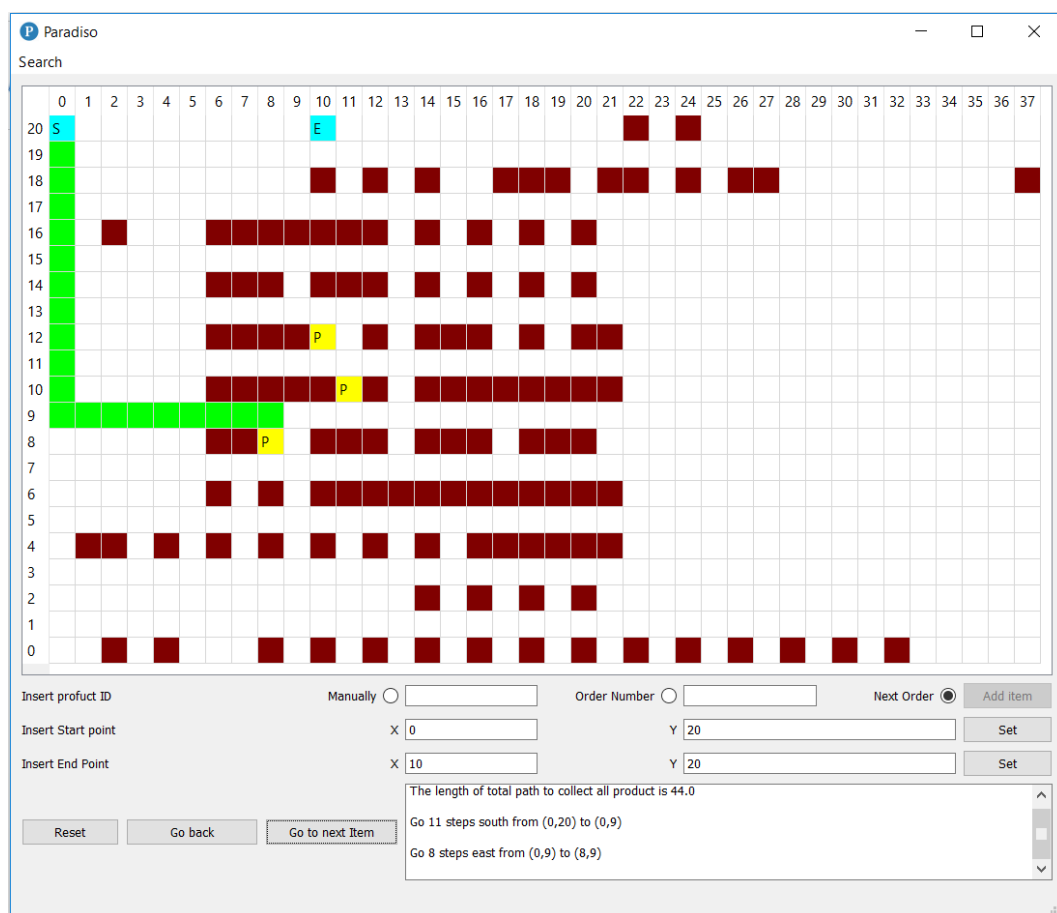


Figure 24. Go to first item

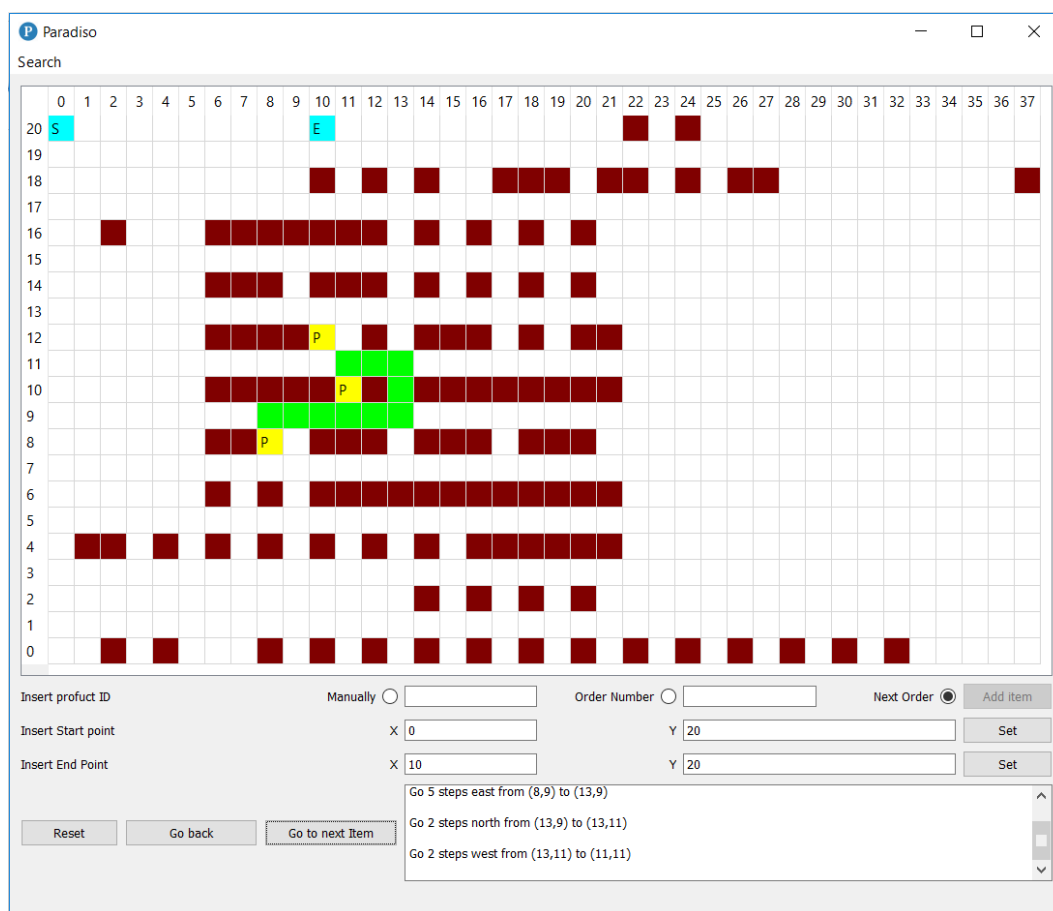


Figure 25. Go to next item

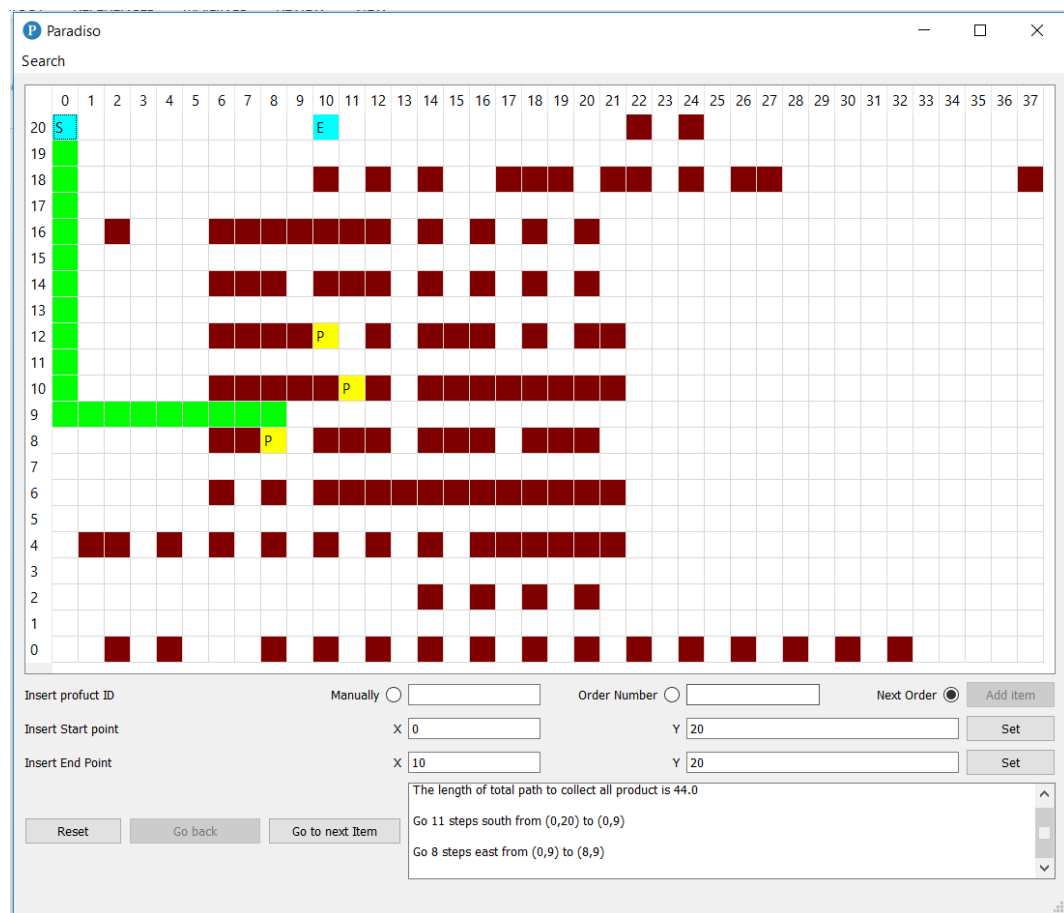


Figure 26. Go to previous item

4.7. Reset

There is a reset button which reset all the settings and clears the map and you can add new products.

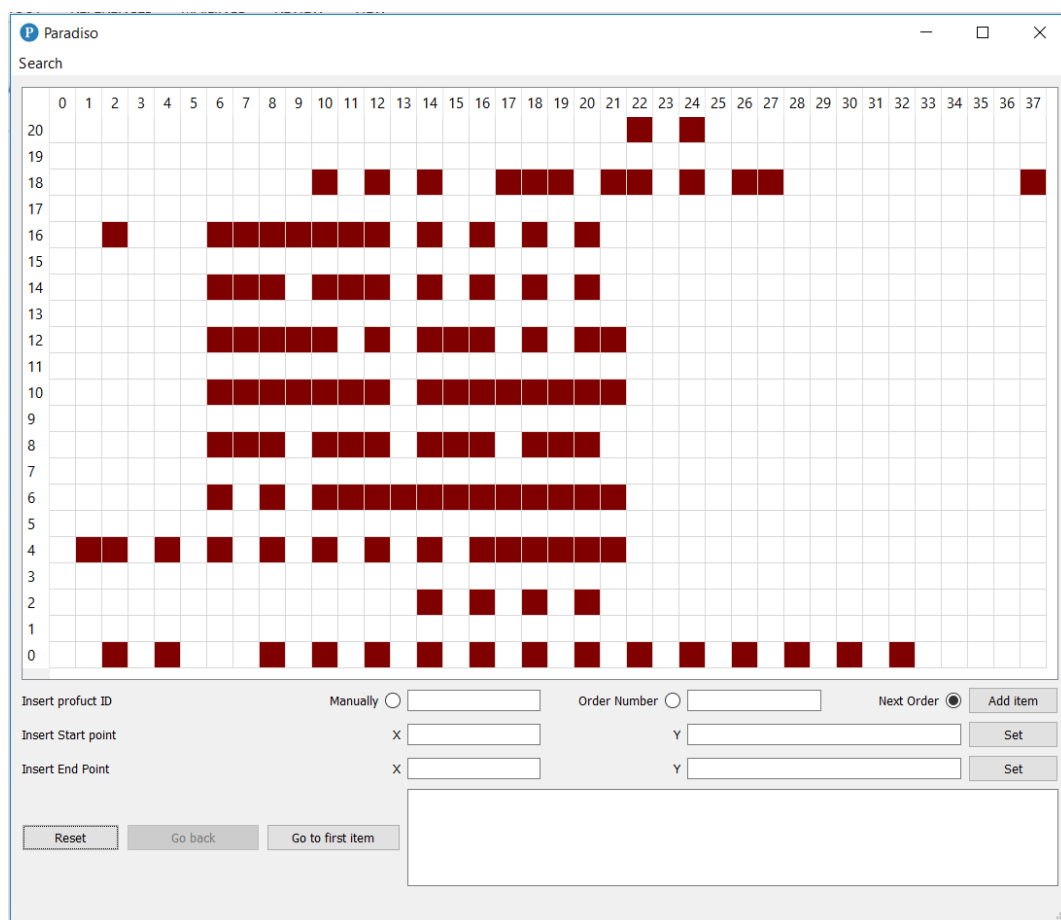


Figure 27. Reset Button

5. Back Matter

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5.2. Error Messages

Table 1 Error Messages

No.	Error Message	Description
1	Wrong username or password!	You have entered the wrong username or password to Sign In.
2	Username already exists!	You have entered the username to sign up which is already in data base.
3	Password fields are not match!	Password fields for sign up form are not match!
4	Please complete all the fields!	You have not entered all the information to sign up!
5	You are not Signed In!	You clicked on sign out while you are not even signed in.
6	You are not Signed In! Use Sign In option to Sign In first.	You clicked on run the application before signing in.
7	You are already Signed In, use start the application button to run the application.	You clicked on sign in option after signing in to the application.
8	The product you enter is not valid. Please enter a valid product Id ...	The requested item does not exist in the warehouse database.
9	Product ID is not even a number ...	The entered product ID is not a number
10	Sorry, the product is not accessible now	There is not any valid route to the requested item.

11	The point you entered is out of range Please enter a valid location ...	The entered value for point coordinates is outside of map.
12	Please fill all the locations or product ID	Some input information is missing which can be start point coordinates, end point coordinates, or product ID.
13	The point you entered is located on shelves Please enter a valid location ...	The entered start/end point is located on shelves.
14	Your location is not even a number ...	The entered start/end point may be negative number or may contain letters or symbols.
15	Please select one method to place your order ...	Before clicking on Add item, you should choose one of the three methods.
16	Your order number is out of range	The number of order entered is not a valid order number.
17	This order already picked	The order number user entered has been picked already.