documentation

April 22, 2025

[1]:
```
# Interact with ERPNEXT database
site_dir = "/home/cole/madrid/sites"
db_name = "cole"
db = "test"
import os

current_dir = os.getcwd()
os.chdir(site_dir)

import frappe

frappe.connect(db, db_name=db_name)
import sys

sys.path.append("/home/cole/madrid/apps/inventory_tools/inventory_tools")
```

1 Documentation

[2]:
```
def optimize_route_picklist_debug(item_whs: list, root_warehouse: str) -> list:
        """Optimize the pick-up route for a list of items.

        This function takes a list of dictionaries, each representing an item␣
 ↪along with its warehouse
        location, and returns the list reordered based on an optimized pick-up␣
 ↪sequence.

        Expected format of `item_whs`:
                [
                        {
                                'item_code': <str>,   # The code identifying␣
 ↪the item.
                                'warehouse': <str>    # The warehouse where the␣
 ↪item is located.
                        },
                        ...
                ]
```

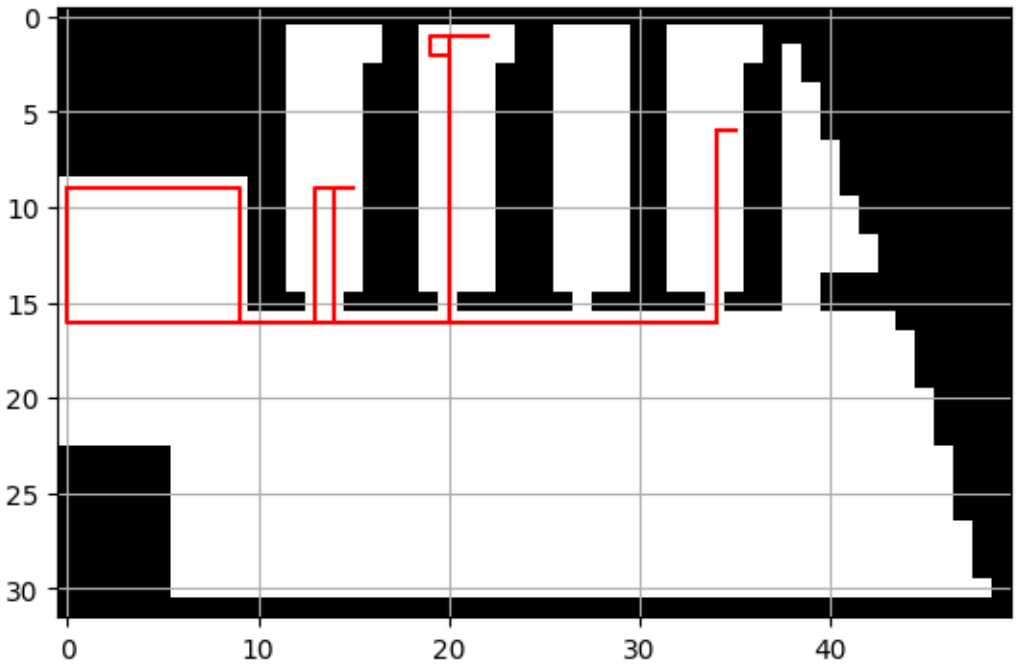
```
        Returns:
                list: A reordered list of dictionaries, optimized for the␣
↪pick-up route.
        """

        # Grid
        grid = np.array(
                safe_json_loads(frappe.get_doc("Warehouse Plan",␣
↪root_warehouse).as_dict()["matrix"])
        )

        # Scale
        imaginary_x = grid.shape[1]
        real_x = frappe.get_doc("Warehouse Plan", root_warehouse).
↪as_dict()["horizontal"]
        scale = real_x / imaginary_x

        # Create the TSP solver instance.
        g = Grid_TSP(grid, scale=scale)

        root_wh = frappe.get_doc("Warehouse Plan", "All Warehouses - CFC").
↪as_dict()
        dropoff = [g.pos2node((root_wh["pickup_point_x"],␣
↪root_wh["pickup_point_y"]))]

        # Waypoints
        unique_whs = list({item_wh["warehouse"] for item_wh in item_whs})

        # Build a mapping from warehouse to its coordinate and node.
        warehouse_to_node = {}
        for wh in unique_whs:
                accessible_path = frappe.get_doc("Warehouse", wh).
↪as_dict()["accessible_path"].split(",")
                coordinate = (int(accessible_path[0]), int(accessible_path[1]))
                warehouse_to_node[wh] = g.pos2node(coordinate)
        node_to_warehouse = {node: wh for wh, node in warehouse_to_node.items()}

        # For the TSP solver, create a list of nodes corresponding to each␣
↪unique warehouse.
        pickup_list = list(warehouse_to_node.values())

        # Solve
        pickup_order, *rest = g.tsp(dropoff, pickup_list, True)

        # Map warehouse name to its order
```

```
        warehouse_order_map = {}
        for order_index, node in enumerate(pickup_order):
                wh = node_to_warehouse[node]
                warehouse_order_map[wh] = order_index

        # Sort original item_whs
        sorted_item_whs = sorted(
                item_whs,
                key=lambda item: (warehouse_order_map[item["warehouse"]],␣
 ↪item["item_code"], item["qty"]),
        )
        return rest
```

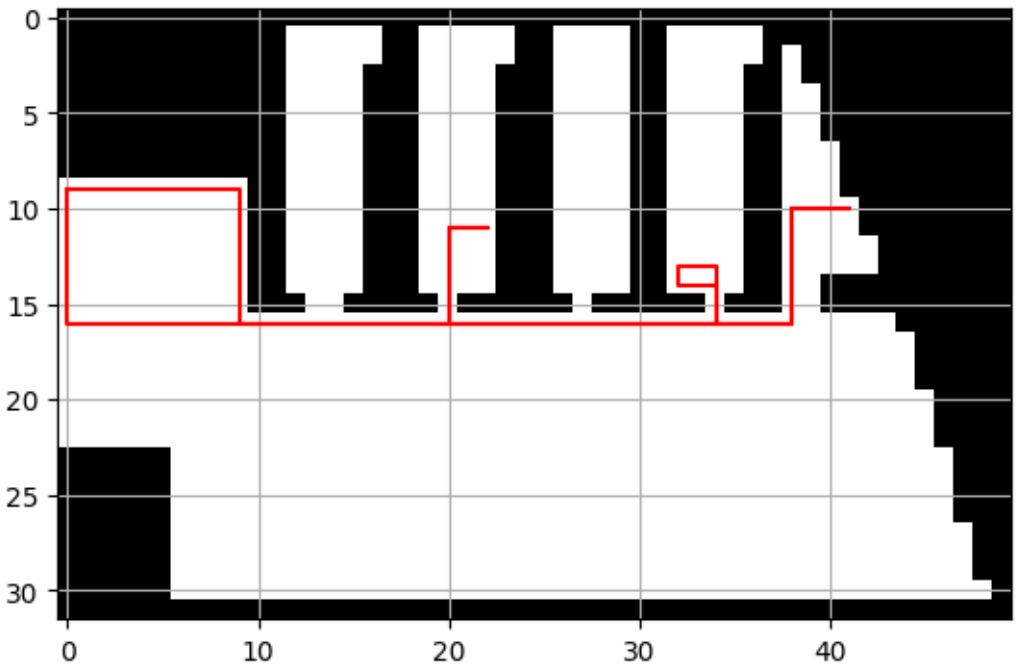
[3]:
```
from inventory_tools.inventory_tools.overrides.pick_list import (
    optimize_path,
    optimize_route_picklist,
)
import frappe
from frappe.utils import safe_json_loads
from frappe.utils.data import nowdate
import numpy as np
from inventory_tools.inventory_tools.doctype.warehouse_plan.warehouse_plan␣
 ↪import Grid_TSP
from pprint import pprint

methods = [
    "FIFO",
    "LIFO",
    "Deplete maximum number of Bins",
    "Deplete minimum number of Bins",
]
root_warehouse = 'All Warehouses - CFC'
grid = np.array(
    safe_json_loads(frappe.get_doc("Warehouse Plan", root_warehouse).
 ↪as_dict()["matrix"])
)
for m in methods:
    print(f"Method: {m}")
    optimized = optimize_path("STO-PICK-2025-00001", m)
    pprint(optimized)
    out = optimize_route_picklist_debug(optimized, root_warehouse)
    print(f"Distance: {out[1]}")
    Grid_TSP(grid)._plot(out[0])
```

```
Method: FIFO
[{'item_code': 'Bayberry', 'qty': 17.0, 'warehouse': 'Fruit Storage 11 - CFC'},
 {'item_code': 'Lychee', 'qty': 3.0, 'warehouse': 'Fruit Storage 49 - CFC'},
```

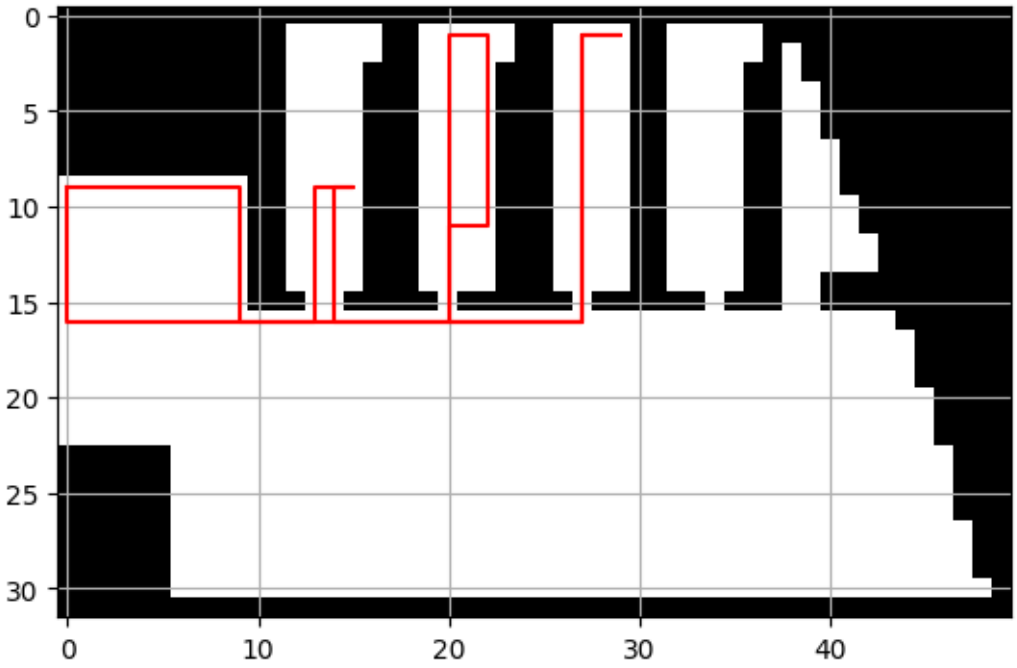
```
 {'item_code': 'Kepel', 'qty': 12.0, 'warehouse': 'Fruit Storage 21 - CFC'},
 {'item_code': 'Bayberry', 'qty': 3.0, 'warehouse': 'Fruit Storage 14 - CFC'}]
Distance: 156.0
```




```
Method: LIFO
[{'item_code': 'Bayberry', 'qty': 20.0, 'warehouse': 'Fruit Storage 57 - CFC'},
 {'item_code': 'Kepel', 'qty': 12.0, 'warehouse': 'Fruit Storage 45 - CFC'},
 {'item_code': 'Lychee', 'qty': 3.0, 'warehouse': 'Fruit Storage 25 - CFC'}]
Distance: 132.0
```




```
Method: Deplete maximum number of Bins
[{'item_code': 'Bayberry', 'qty': 10.0, 'warehouse': 'Fruit Storage 34 - CFC'},
 {'item_code': 'Lychee', 'qty': 3.0, 'warehouse': 'Fruit Storage 25 - CFC'},
 {'item_code': 'Kepel', 'qty': 12.0, 'warehouse': 'Fruit Storage 21 - CFC'},
 {'item_code': 'Bayberry', 'qty': 10.0, 'warehouse': 'Fruit Storage 11 - CFC'}]
Distance: 152.0
```




```
Method: Deplete minimum number of Bins
[{'item_code': 'Bayberry', 'qty': 20.0, 'warehouse': 'Fruit Storage 57 - CFC'},
 {'item_code': 'Kepel', 'qty': 12.0, 'warehouse': 'Fruit Storage 45 - CFC'},
 {'item_code': 'Lychee', 'qty': 3.0, 'warehouse': 'Fruit Storage 49 - CFC'}]
Distance: 134.0
```