



DAAD- East European Partnership Exchange Program

student:

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Hamburg 2011

Department of Computer Mathematics and Mathematical Modeling

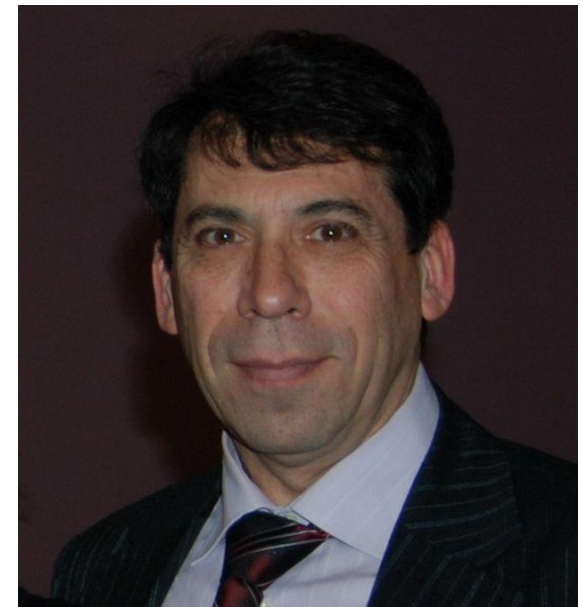
- ❑ **Prof. Leonid M. Lyubchyk is Present Head of the Department.** *Leonid M. Lyubchyk* was graduated from Kharkiv Polytechnic Institute in 1973. He earned Ph.D. degree from Institute of System Analysis, Moscow, Russia, in 1979 and Doctor Degree from the Kharkiv Polytechnic Institute in 1995.

- ❑ **Actively developing directions:**

- Supply chain based on the methods of the modern theory of robust;
- Control theory, Discrete optimization;
- IT technologies,

- ❑ **The basic disciplines:**

- Control theory, System and Methods of Decision-Making, Modeling of Economic and Social Processes;
- Programming, Databases, Neural Networks, Information Systems;
- Mathematical Economics, Financial Mathematics, Actuarial Mathematics.



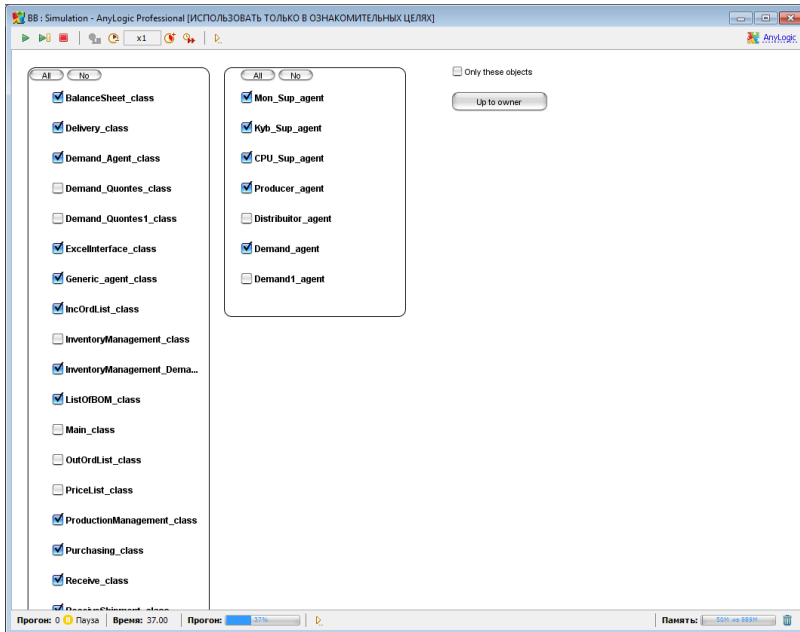
Prof. Leonid M. Lyubchyk

Developed Activities

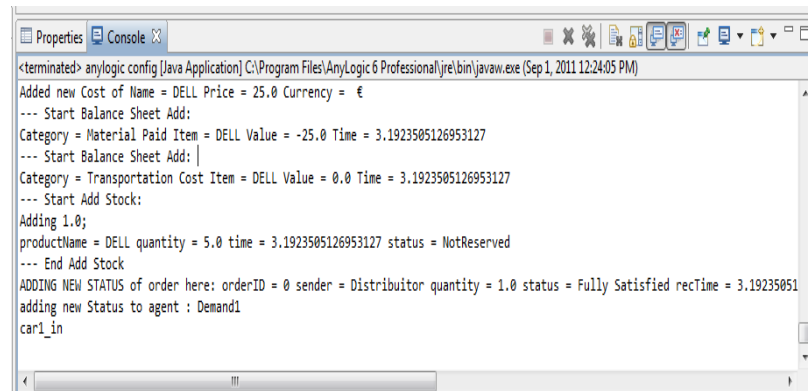
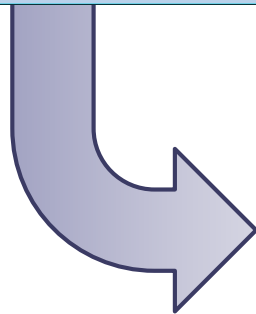
- ☐ Implement functionality to filter debug information;
- ☐ Develop a program to import and assemble open source data about real transport routes;
- ☐ Improve transport functionality using GIS data.



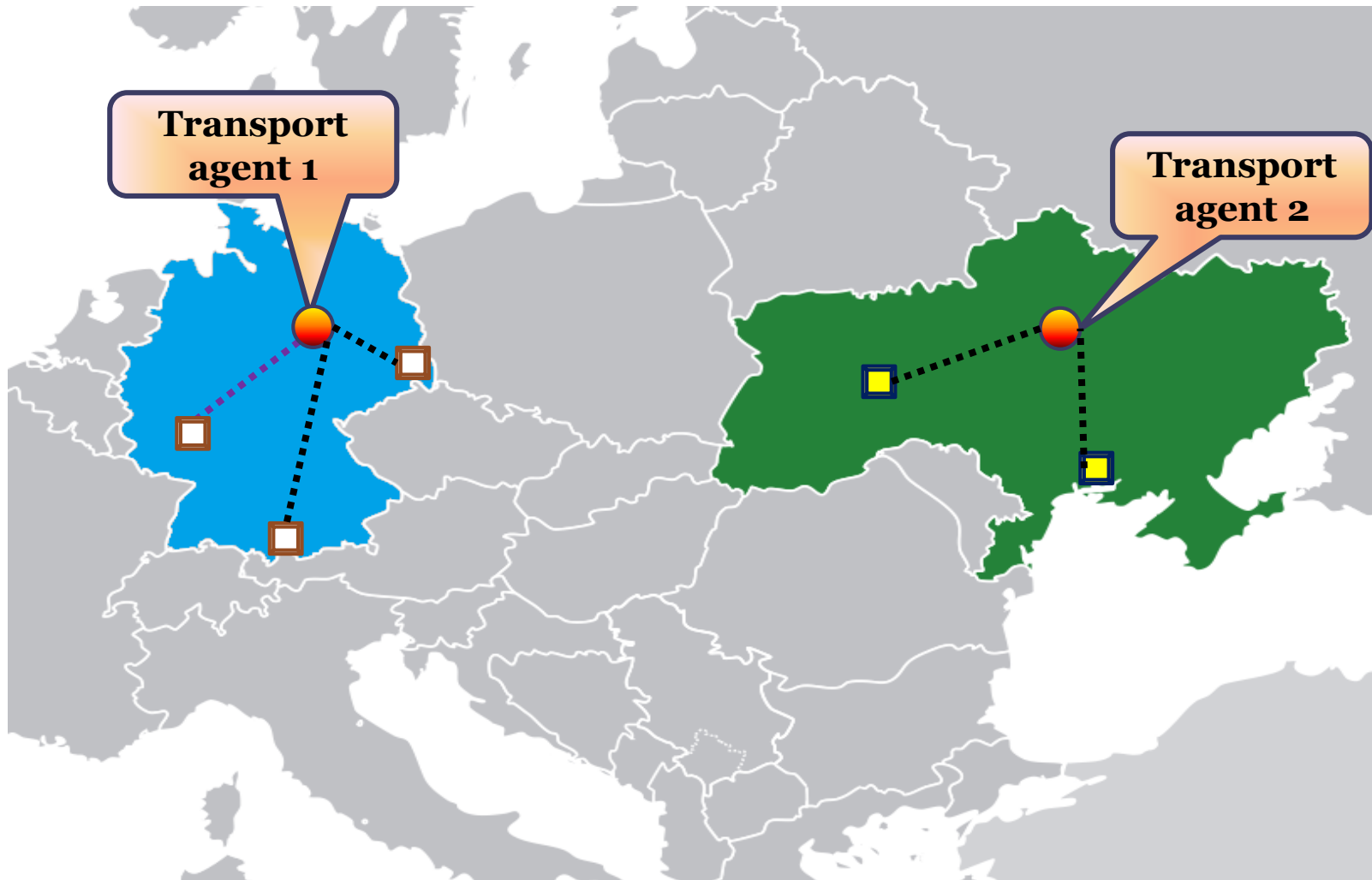
Developed Activities



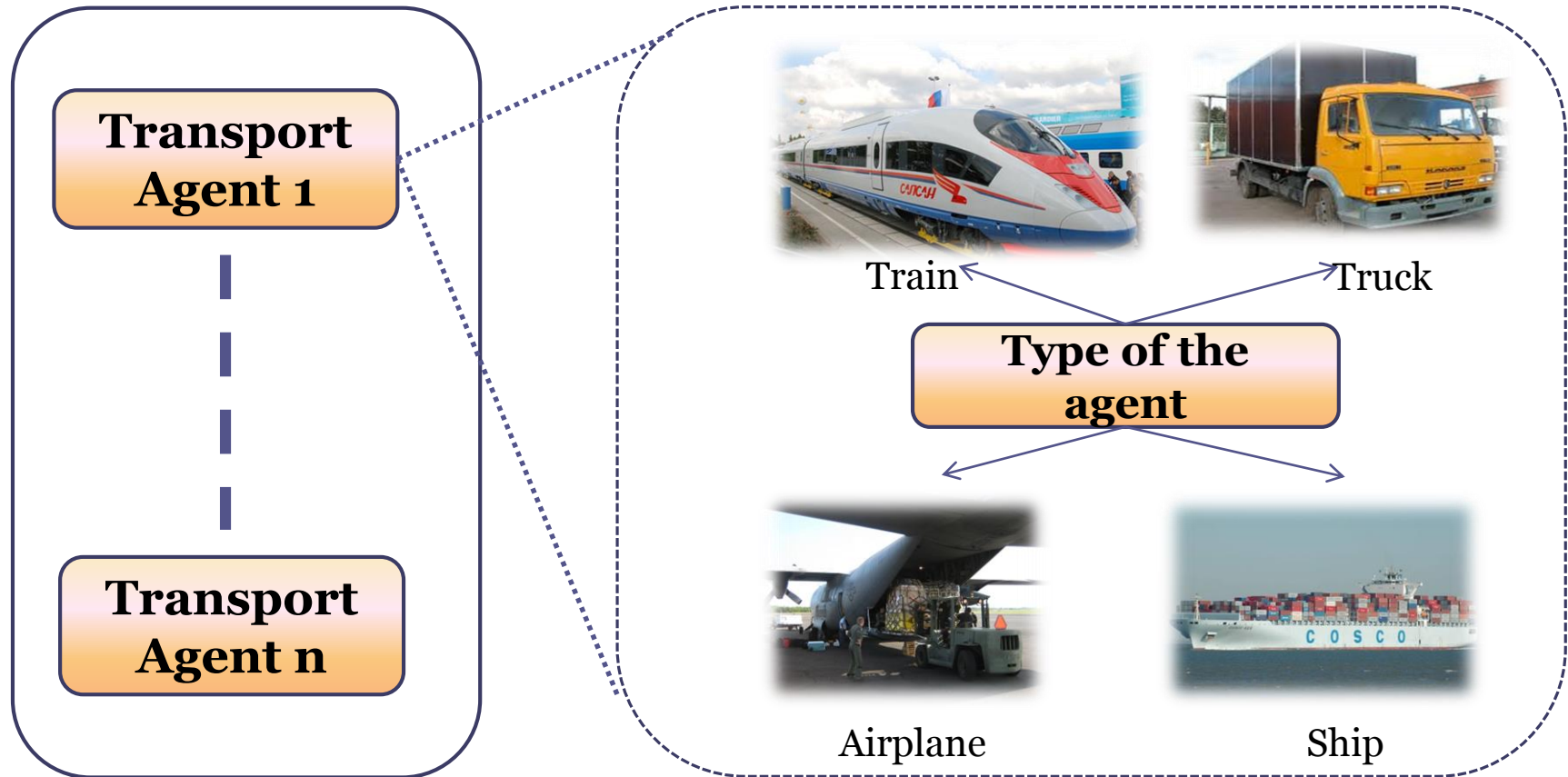
- ☐ Manage output information to the console window for simulation testing;
- ☐ Filter data by objects of classes;
- ☐ Filtering data on the agents.



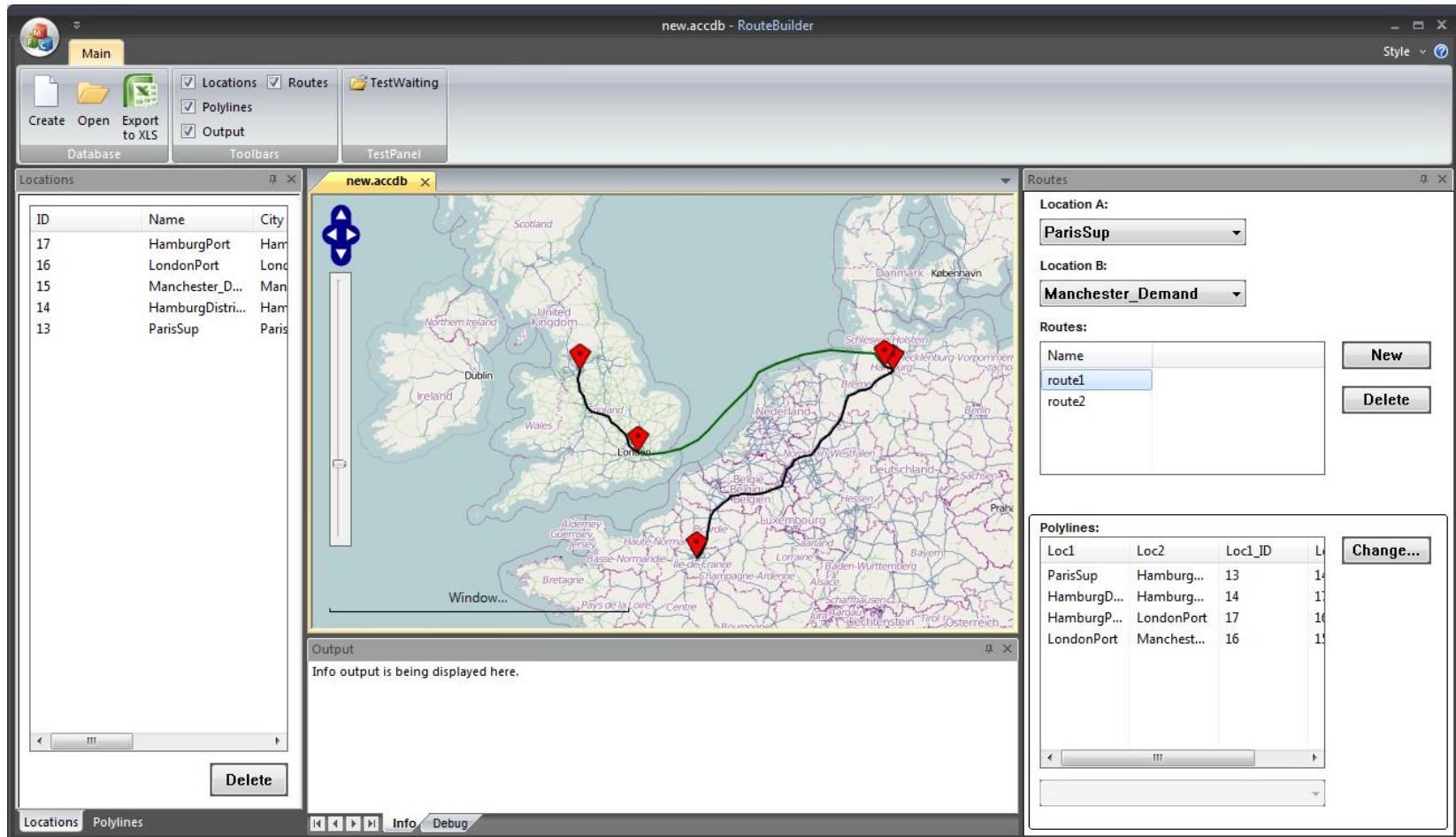
Transport logistics



Transport agents



Development of the program for import open source routes and manually define polylines.



The main window of our program

RouteBuilder program. Step 1: Add locations

The screenshot displays the RouteBuilder application window. The title bar reads "new.accdb - RouteBuilder". The interface includes a menu bar with "Main", a toolbar with "Create", "Open", and "Export to XLS", and a sidebar with "Locations", "Routes", "Polylines", and "Output". The "Locations" tab is active, showing a table of locations. The table has columns for ID, Name, City, Country, Lat, and Lon. The data includes HamburgPort, LondonPort, Manchester_D..., HamburgDistri..., and ParisSup. A "Delete" button is located at the bottom right of the table. To the right of the table is a map of Europe with red diamond markers indicating the locations of Hamburg, London, and Paris. The map is titled "new.accdb" and includes a compass rose and a scale bar. The "Routes" tab is visible on the right side of the window.

ID	Name	City	Country	Lat	Lon
17	HamburgPort	Hamburg	Germany	53.573339	9.701609
16	LondonPort	London	UK	51.510230	-0.007558
15	Manchester_D...	Manchester	UK	53.487017	-2.299581
14	HamburgDistri...	Hamburg	Germany	53.470671	10.035319
13	ParisSup	Paris	France	48.852735	2.300944

RouteBuilder program. Step 2: Add ways

new.accdb - RouteBuilder

Main

Create Open Export to XLS Database

Locations Routes TestWaiting

Polylines

Location A: ParisSup

Location B: HamburgDistributor

Polylines:

Name	Type	Distance(km)
RoadLine_Pari...	Road	883.075000
Train	Train	876.830129

Add Delete

Points:

Lat	Lon
49.611147	3.004413
50.317839	3.509784
50.958851	4.740252
51.289827	5.992694
51.563831	7.574725
51.754657	8.409686
52.362595	8.915057
52.843002	9.090838

Add polyline

Name: RoadLine_ParisSup_HamburgDistributor

Type: Road

☒ CloudMade ☐ Manual

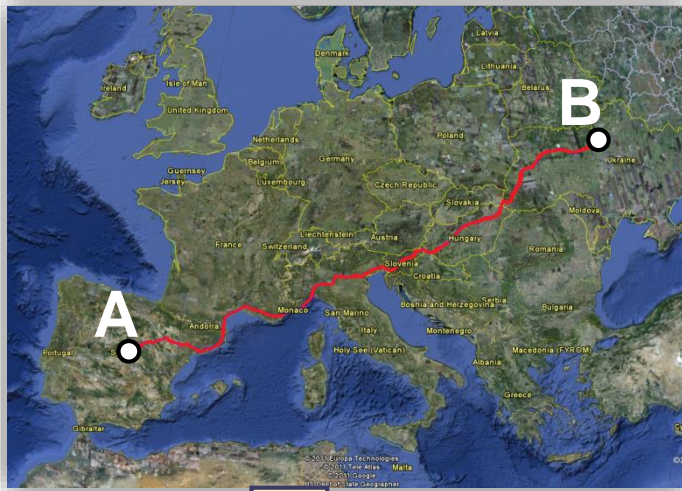
Time(days): 1

OK Cancel

Type of the way creation

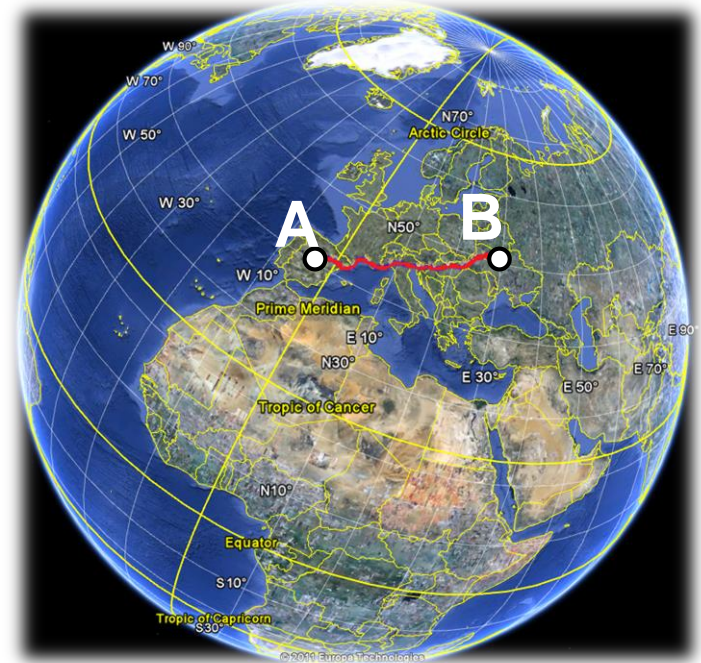
The calculating distance algorithm between two geo-locations

2D(Map)



Using of Vincenty's iterative method to calculate the distance between two points on the surface of a spheroid.

3D(Earth spheroid)



RouteBuilder program. Step 3: Assemble routes

1.acddb - RouteBuilder

Main

1.acddb

Polylines

Loc1

Loc2

Window...

Output

Routes

Location A:
KharkovSup

Location B:
MadridDemand

Routes:

Name
rotue1

New

Delete

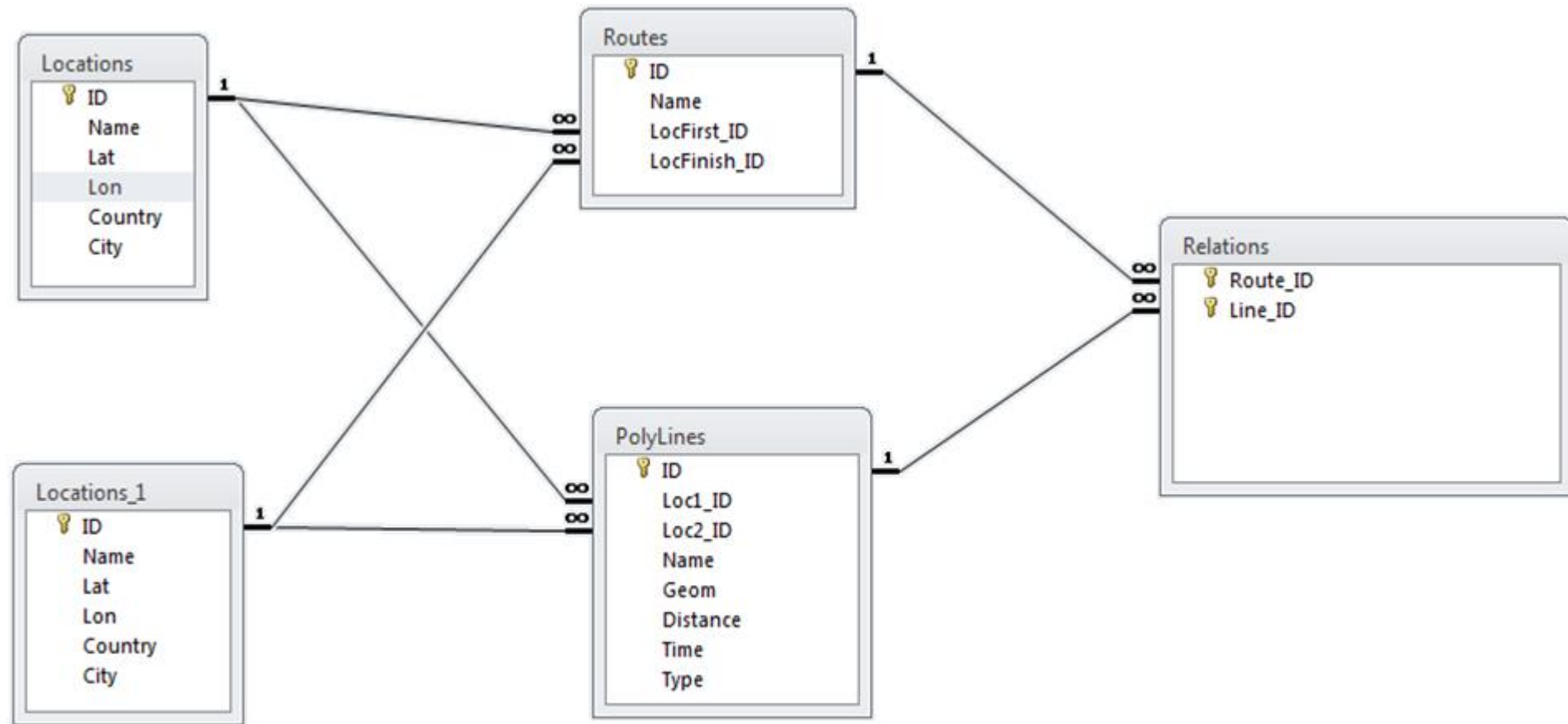
Polylines:

Loc1	Loc2	Loc1_ID
KharkovSup	OdessaPort	26
OdessaPort	Bareslona...	27
BareslonaP...	MadridDe...	30

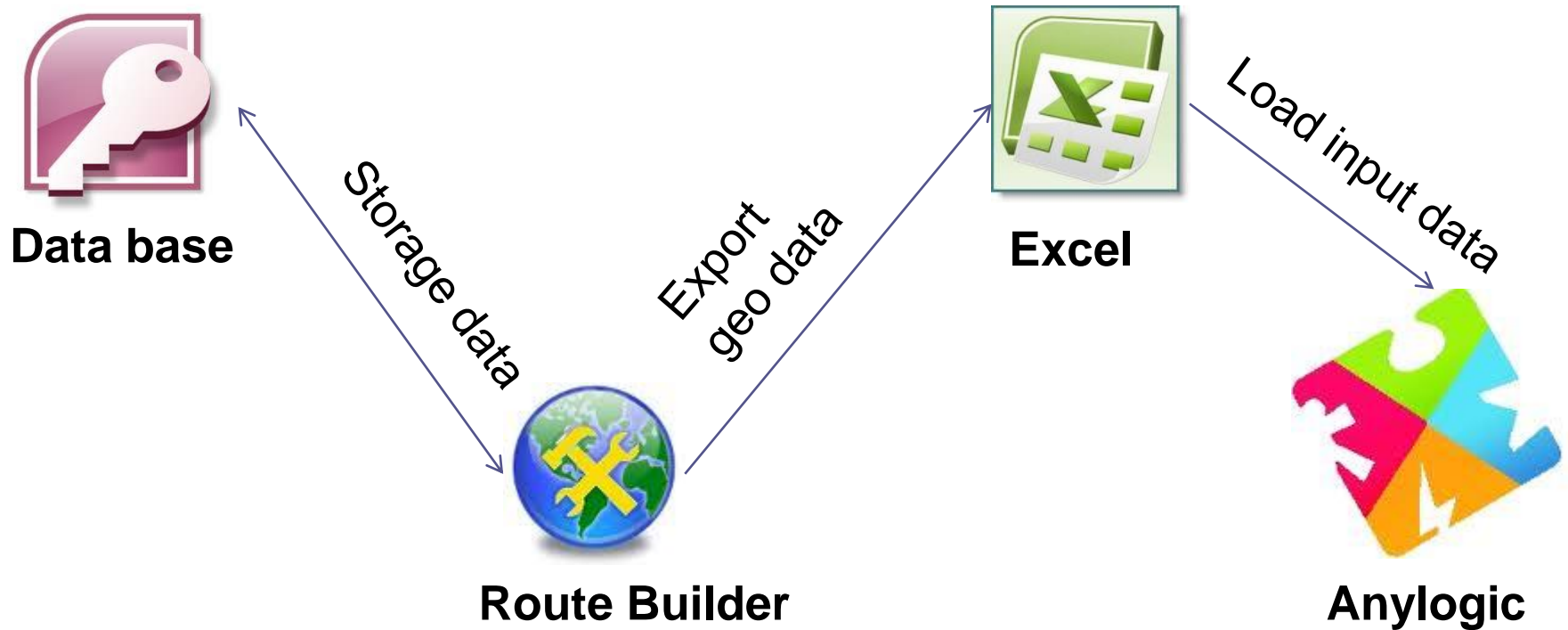
Change...

RoadLine_KharkovSup_Odes

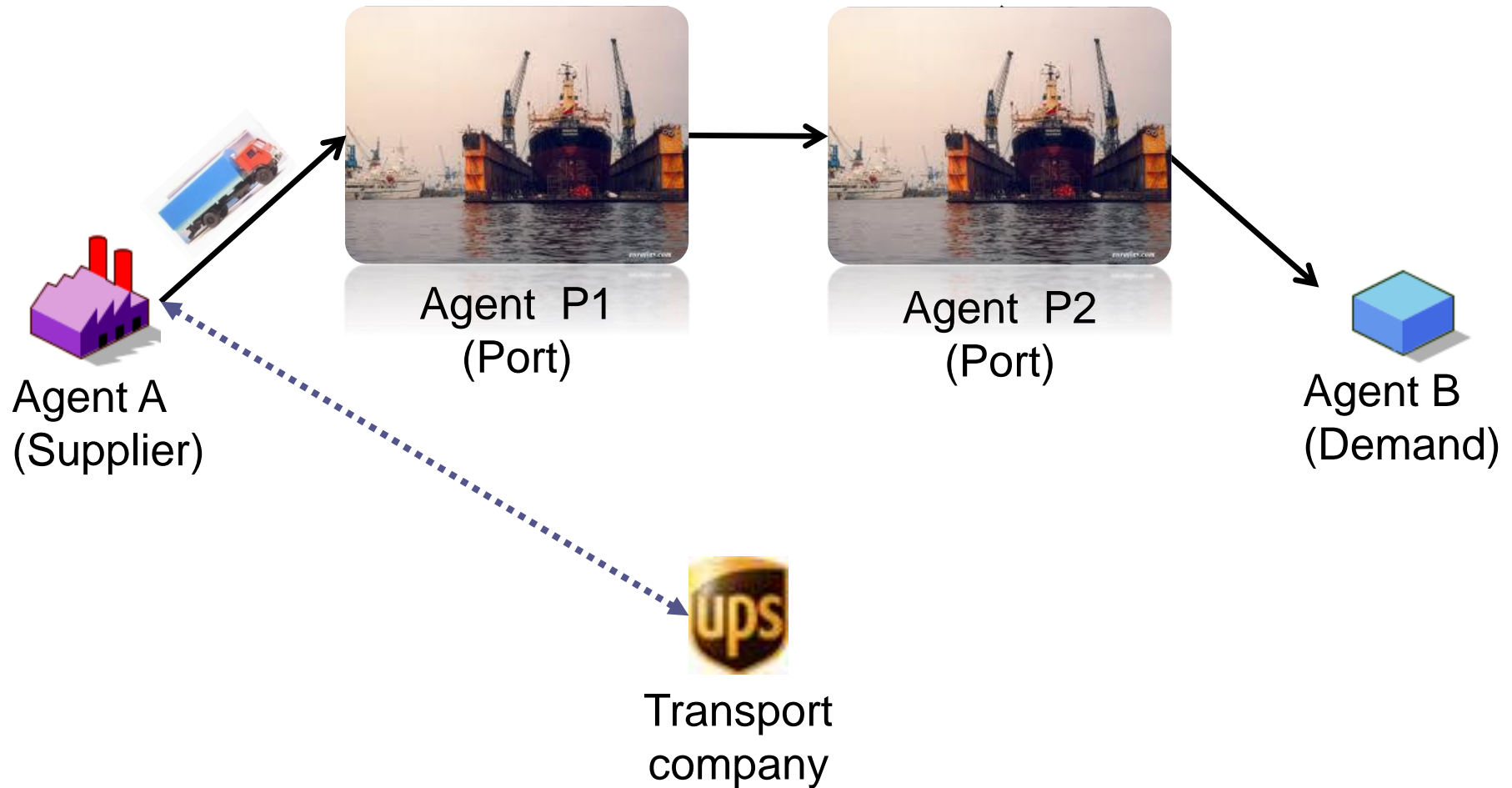
Database structure



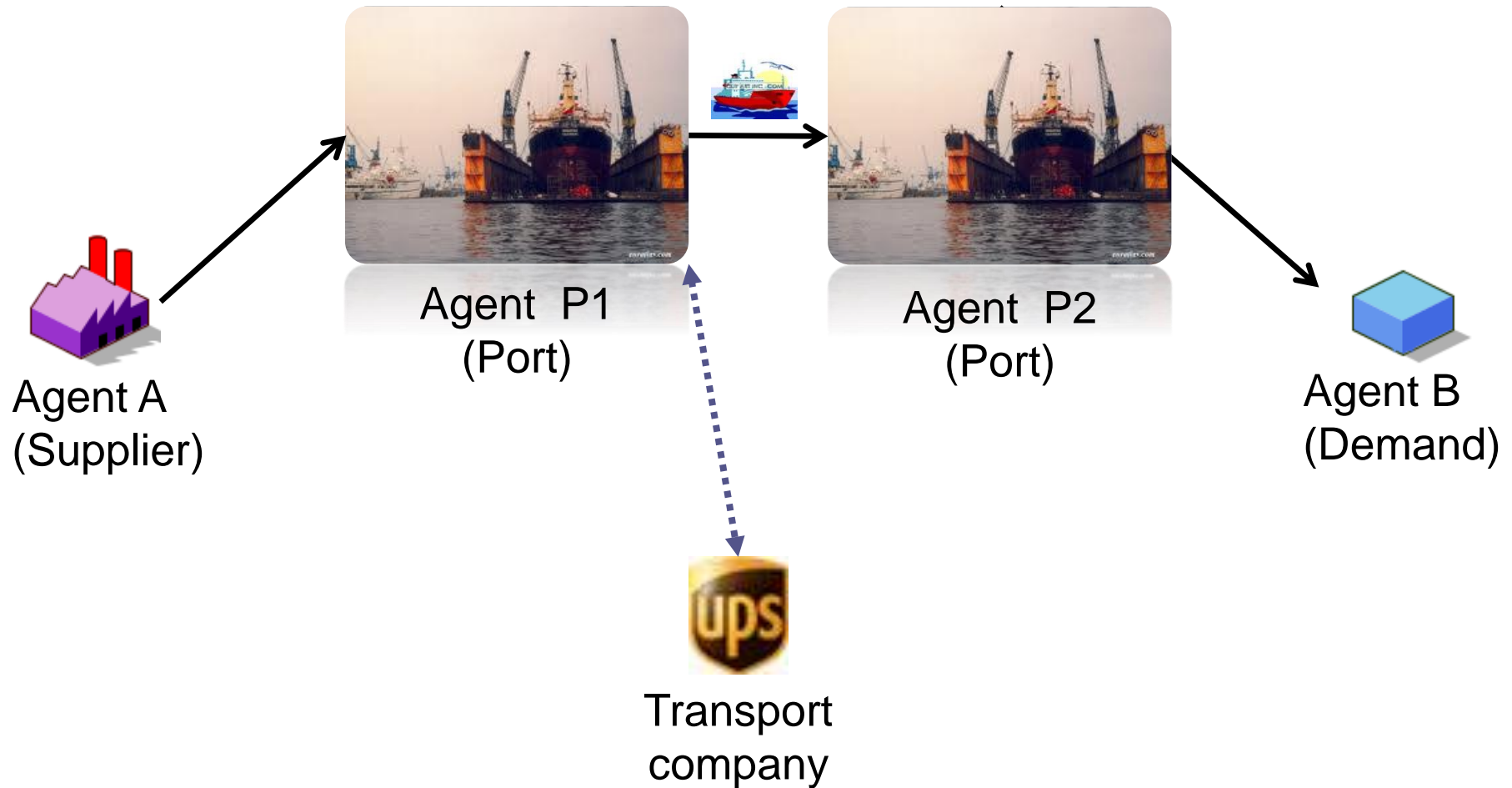
Input data for simulation



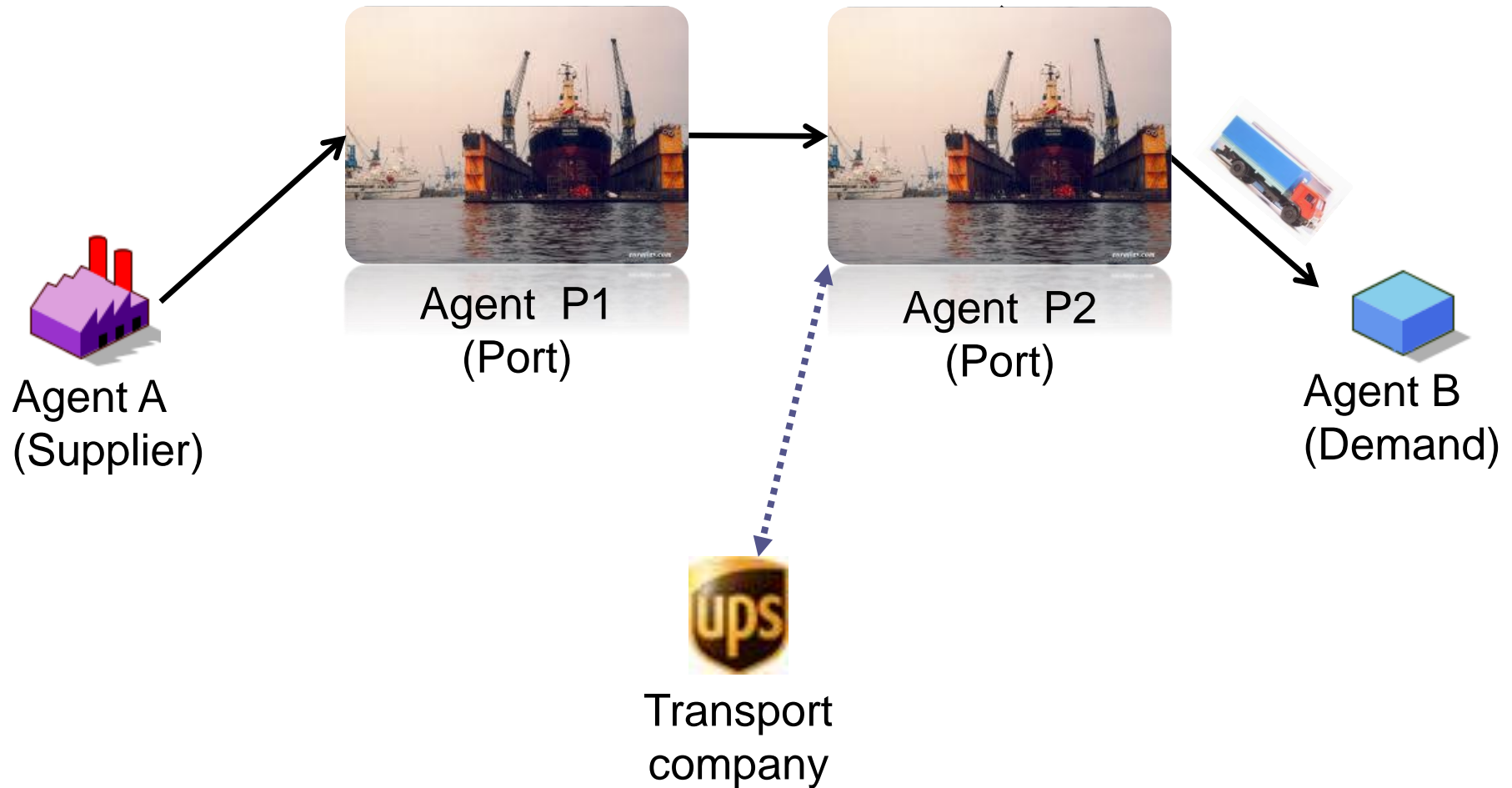
Messages between agents for transportation of products



Messages between agents for transportation of products



Messages between agents for transportation of products



GIS Map

Position of last click

Latitude: **K029°17'44,8"**

Longitude: **B15°05'36,7"**

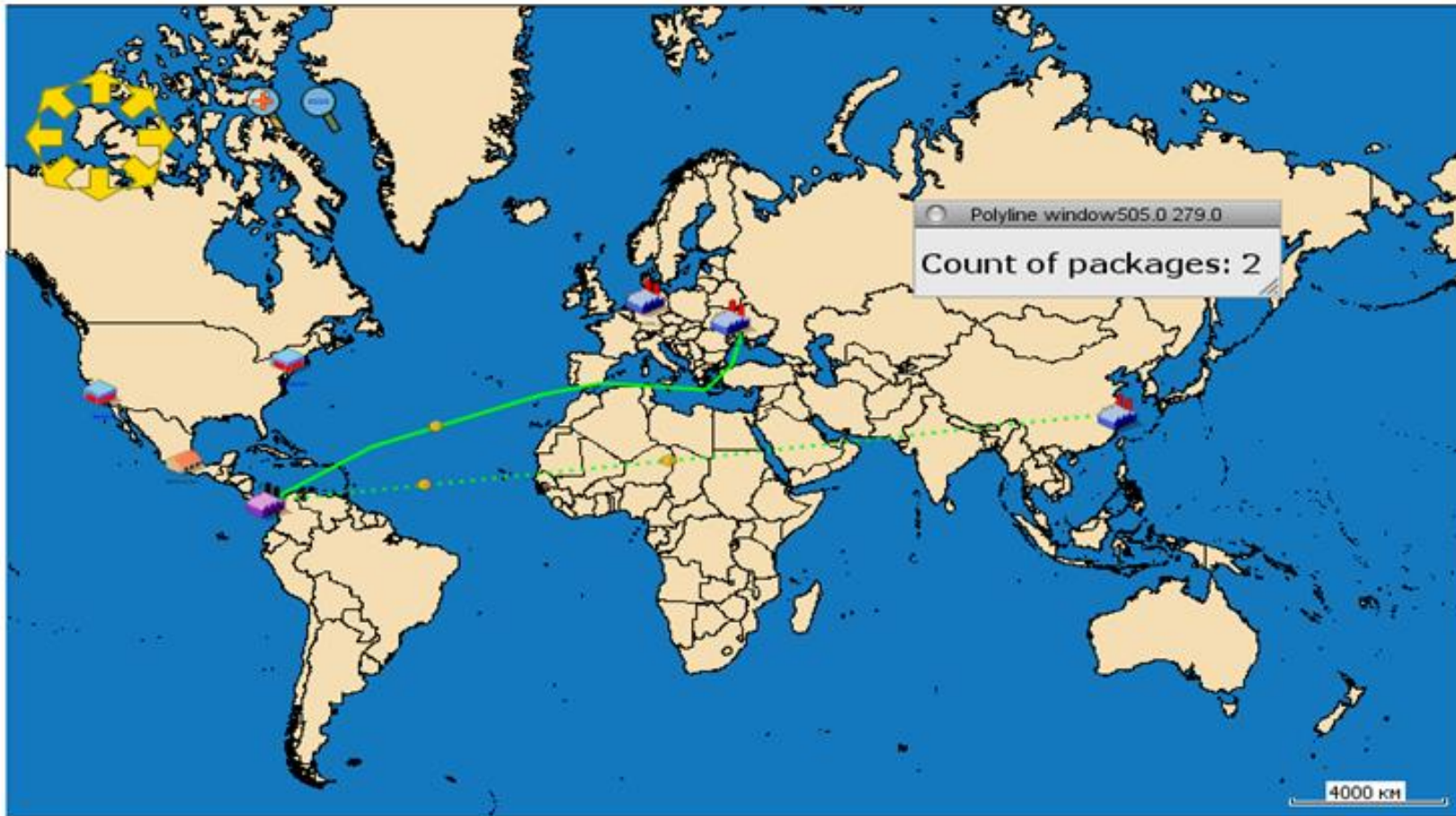
Map projection

Scale: **1:158100496**

Center Latitude: **C31°00'00"**

Center Longitude: **B28°00'00"**

Main



Lessons learnt

- Attended Hamburg International Conference of Logistics;
- Development agent-based platform;
- Anylogic;
- Complexity theory.

My plans for the future

- ☐ I plan to get a master's degree and attend graduate school;
- ☐ Improve and trying to practical use developed information system for dispatching management by motor transport.
- ☐ To develop the project in the sphere of forecasting of traffic`s highways for construction shortest routes taking into account traffic jams.





Thank you
for your attention!