



# LOGISTIC PROBLEM REPORT



**Mini project report by Group 5**

# MEMBERS



Tran Vuong Quoc Dat  
ID: 20200145  
Mail:  
dat.tvp200145@sis.hust.edu.vn



Nguyen Truong Truong An  
ID: 20204866  
Mail:  
an.ntt204866@sis.hust.edu.vn



Le Duc Anh Tuan  
ID: 20204929  
Mail:  
tuan.la204929@sis.hust.edu.vn



Nguyen Thanh Dat  
ID: 20204903  
Mail:  
dat.nt204903@sis.hust.edu.vn



Nguyen Nho Trung  
ID: 20204894  
Mail:  
trung.nn204894@sis.hust.edu.vn

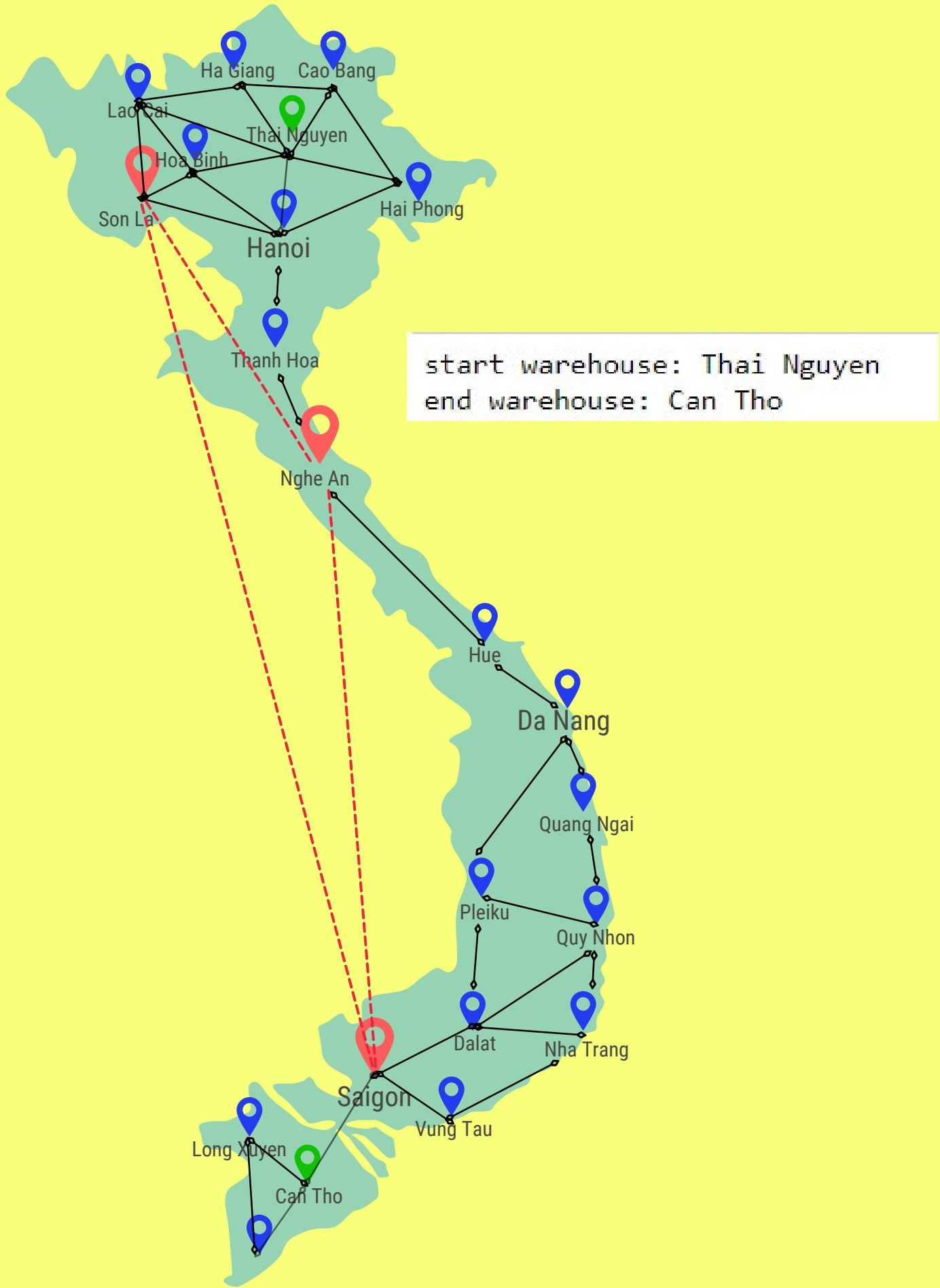


# Problem

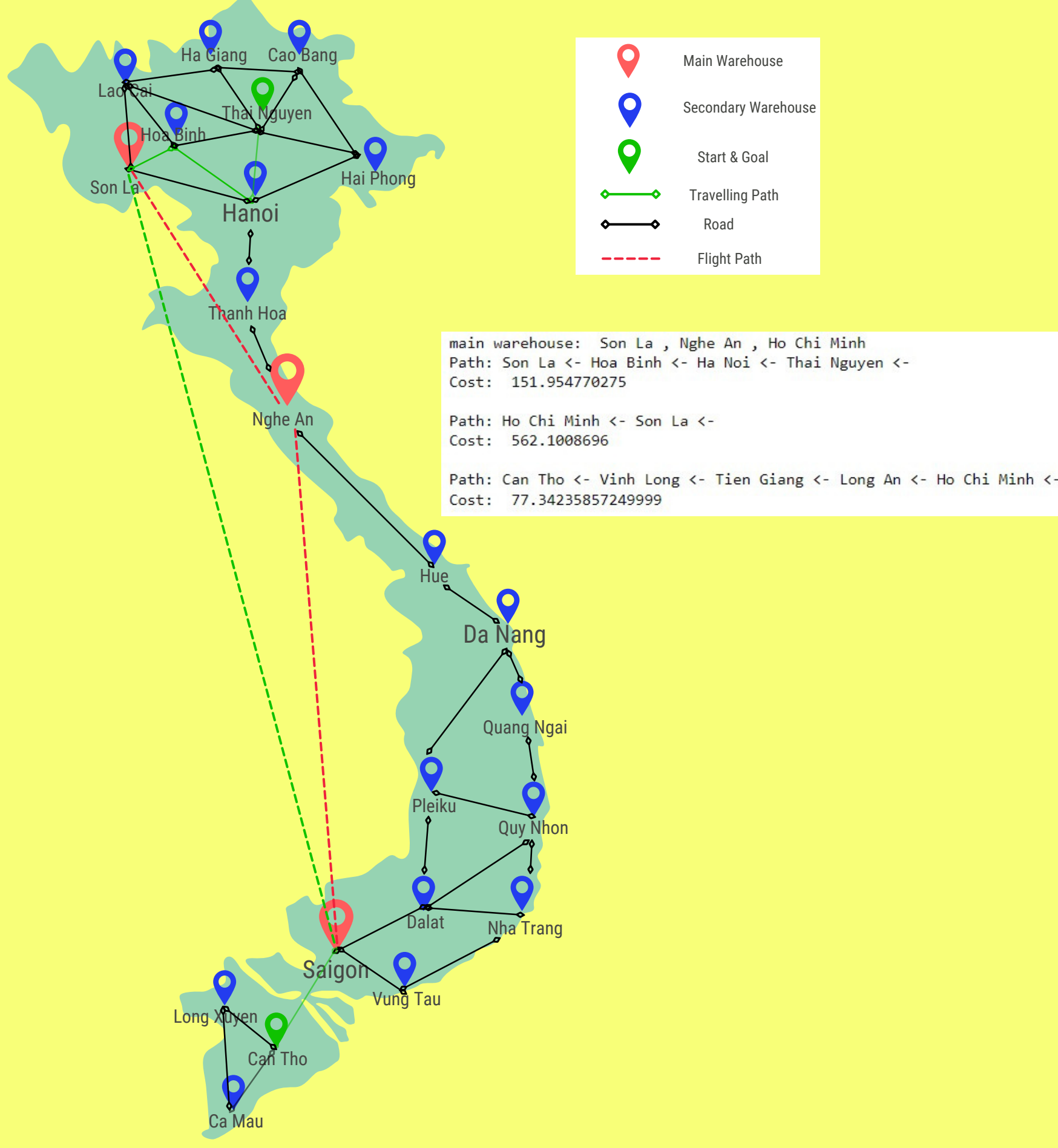
- This is a variant of the Romanian route planning problem.
- The main goal is to find the optimal path between 2 warehouses so that both time and cost are optimized
- There are 2 types of warehouses:
  - Main warehouses: Goods can be transported directly by plane between them, default speed:  $v_{\text{plane}}$  km/h
  - Secondary warehouses: From this, goods can only be transported by truck, default speed is  $v_{\text{truck}}$  km/h
- Goods passing a main warehouse must be stored for  $k$  hours.



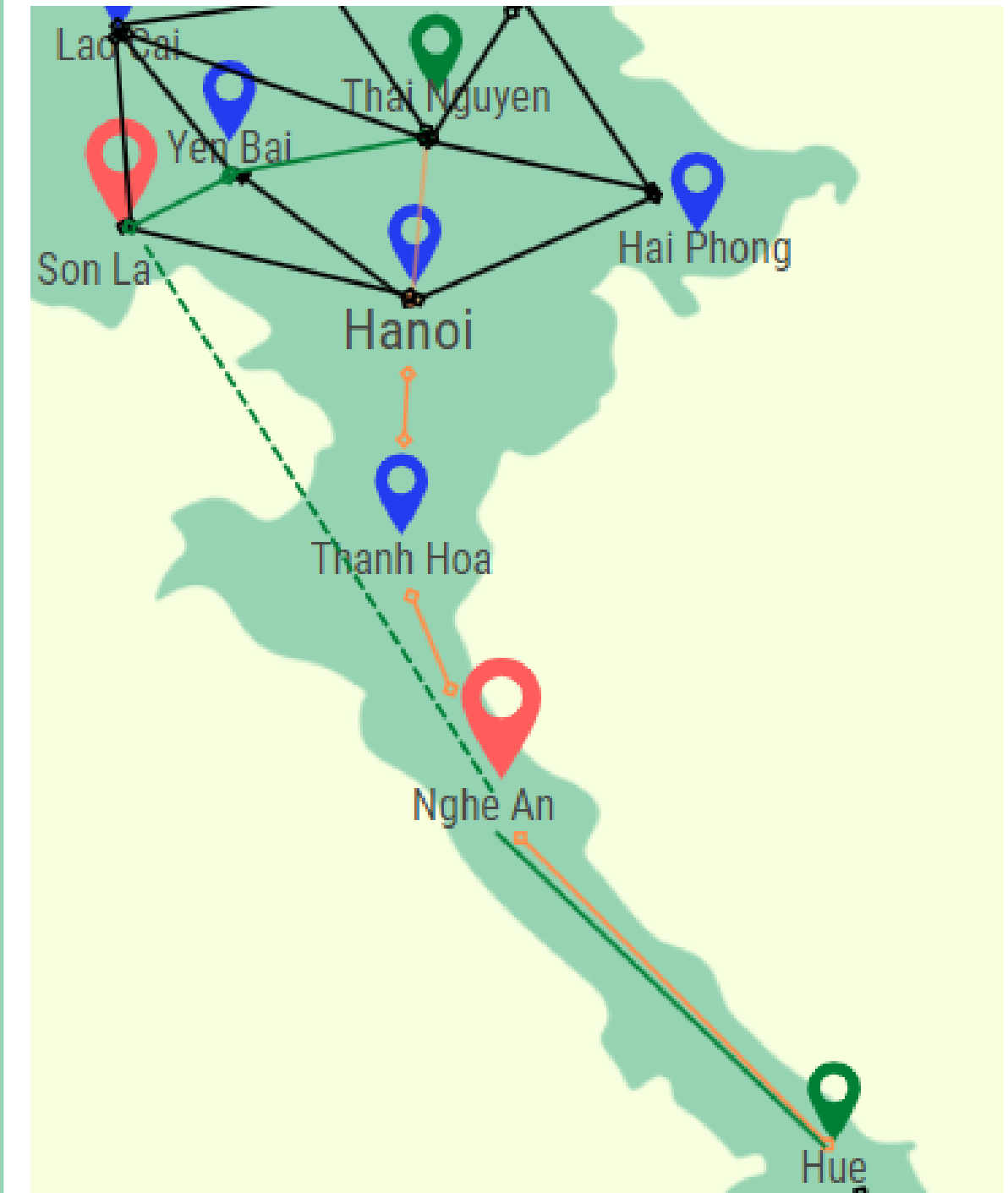
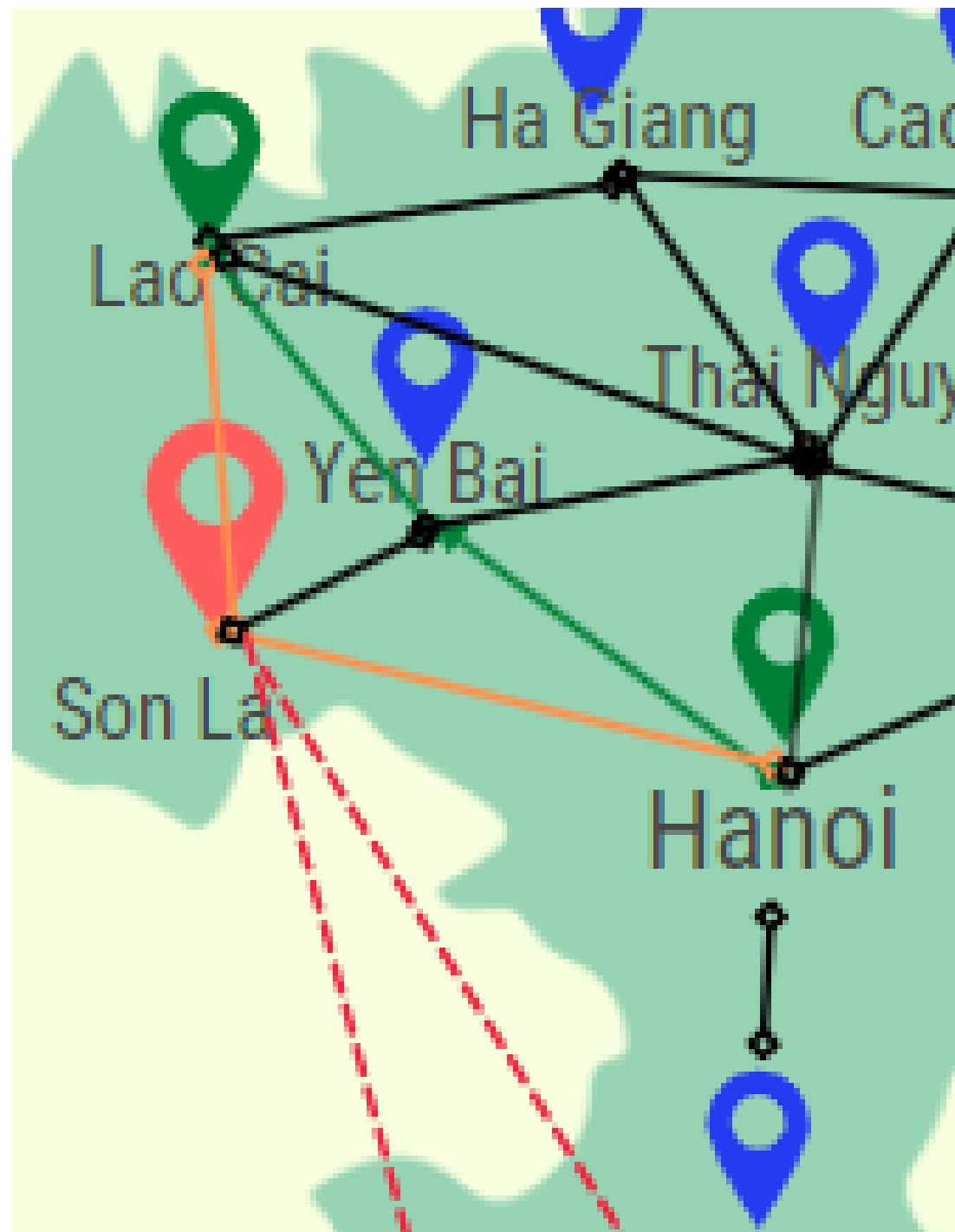
# Input:



# Output



# Constraints



Triangle Rule and Region Traverse Rule

# Convert data



**1160 km**

**Distance Ha Noi-HCM**

original data

Distance data is generated  
from coordinate data



**232**

**$g(x)$**

evaluation parameter

Evaluation function from  
current node to it's parent



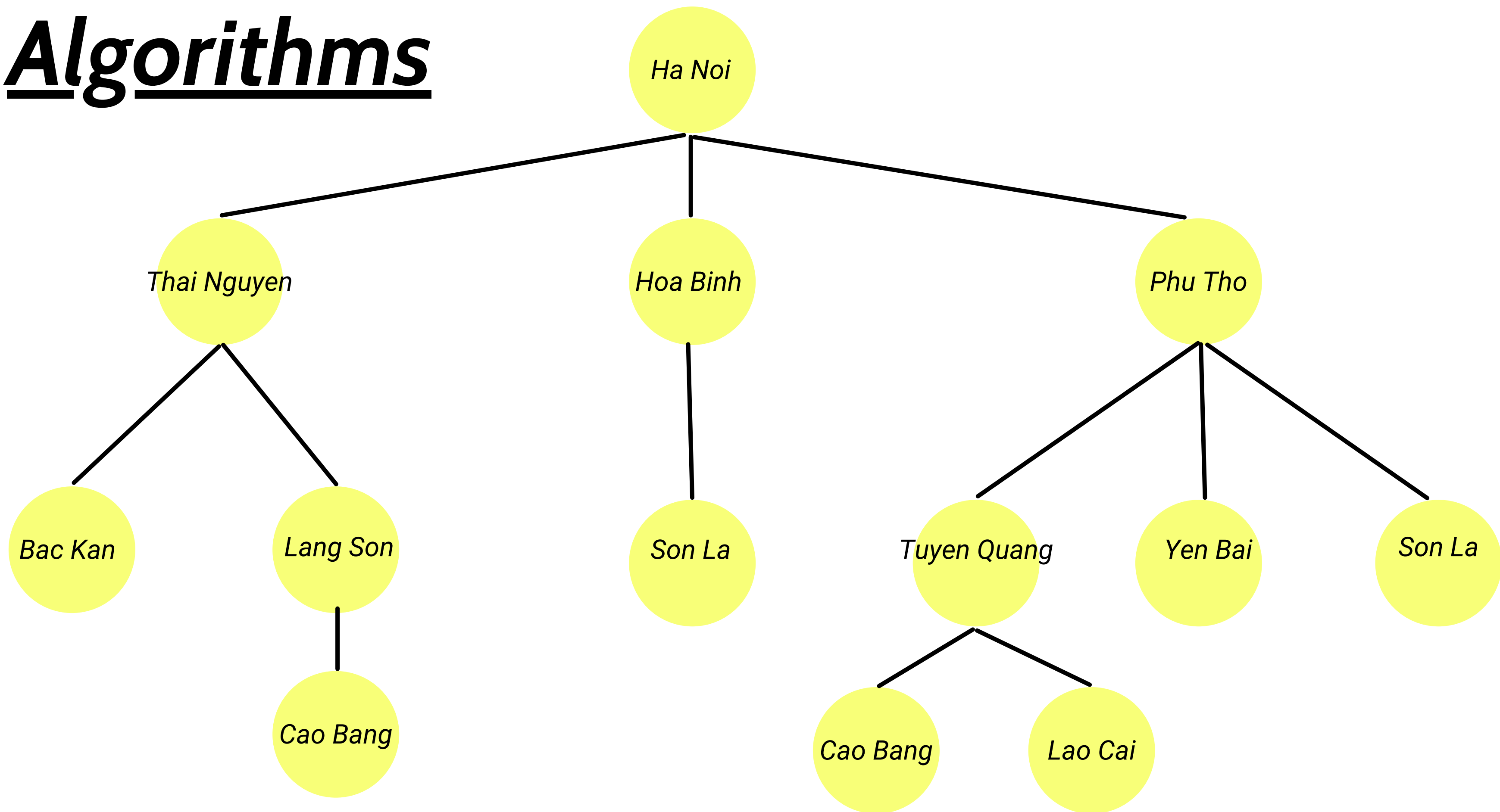
**230**

**$h(x)$**

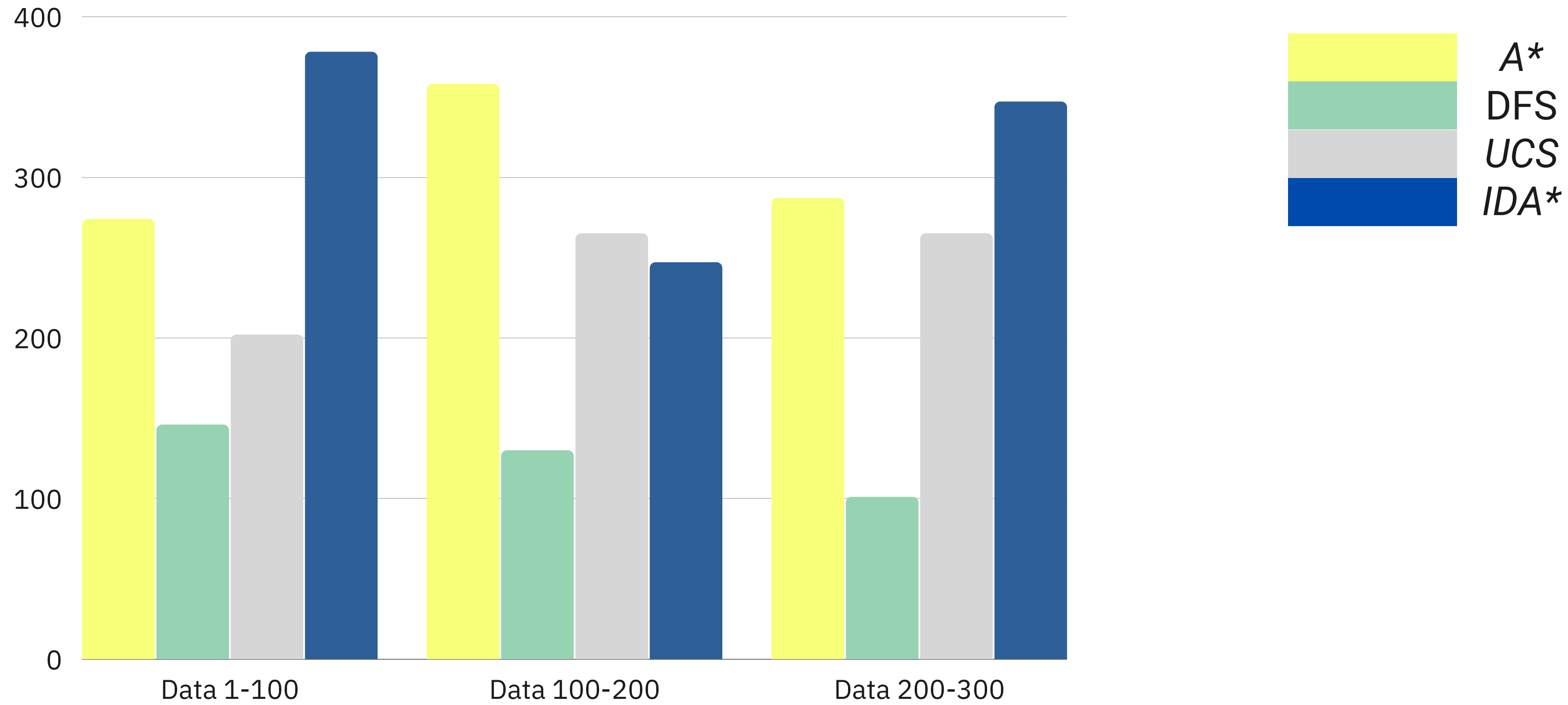
evaluation parameter

Heuristic function from  
current node to goal node

# Algorithms

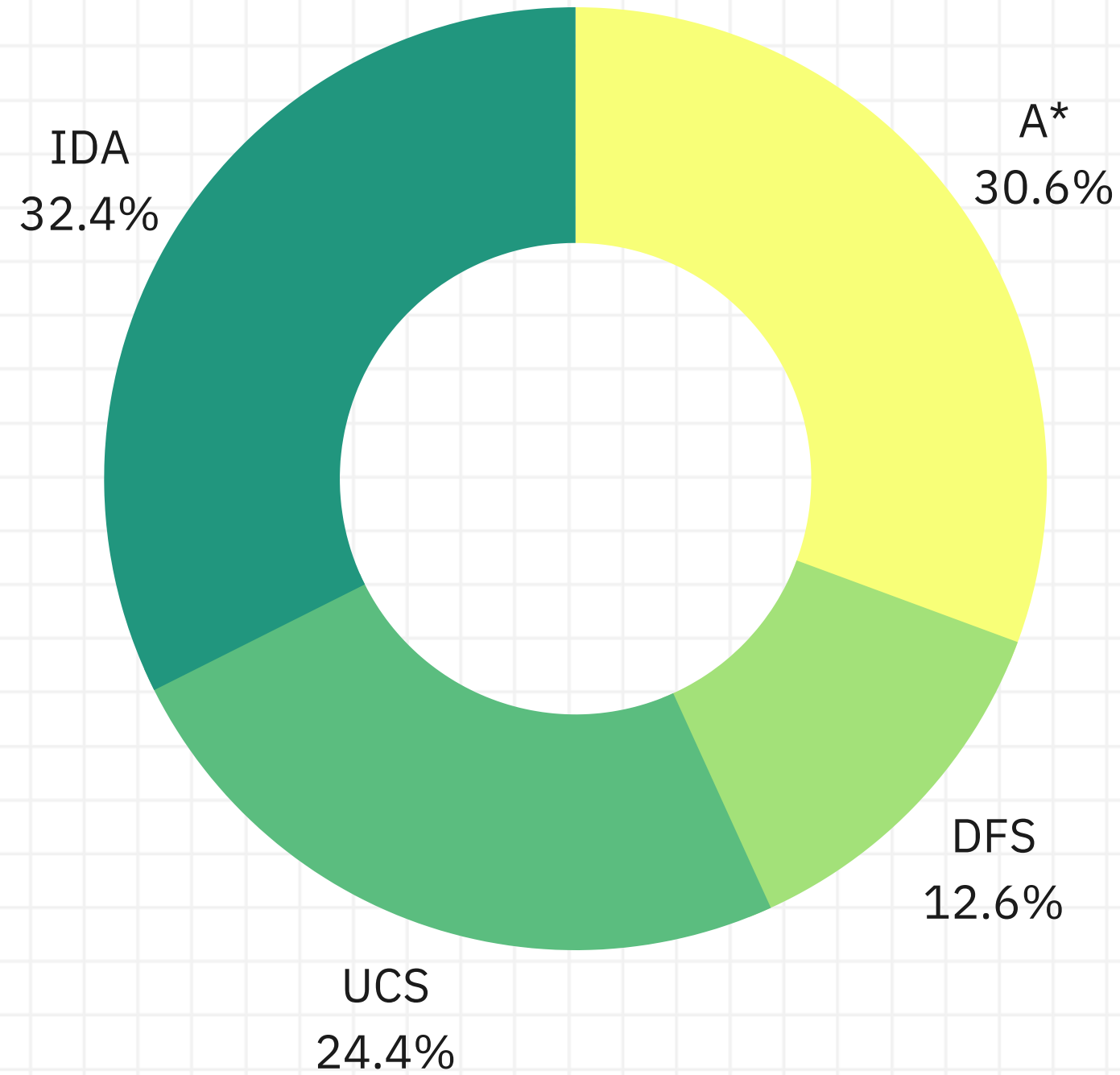


# Visualization



Comparison of optimization among algorithms  
with different datasets





**The chart summarizing the optimization of algorithms**

# Conclusion

A\* and IDA algorithms use both  $g(x)$  and  $h(x)$  to evaluate so that more effective

# Expansion problem

Find a way to transport  $n$  goods through the warehouses for the most optimal cost and time