

# Exploiting Item Dependencies to Improve Tourist Trip Recommendations

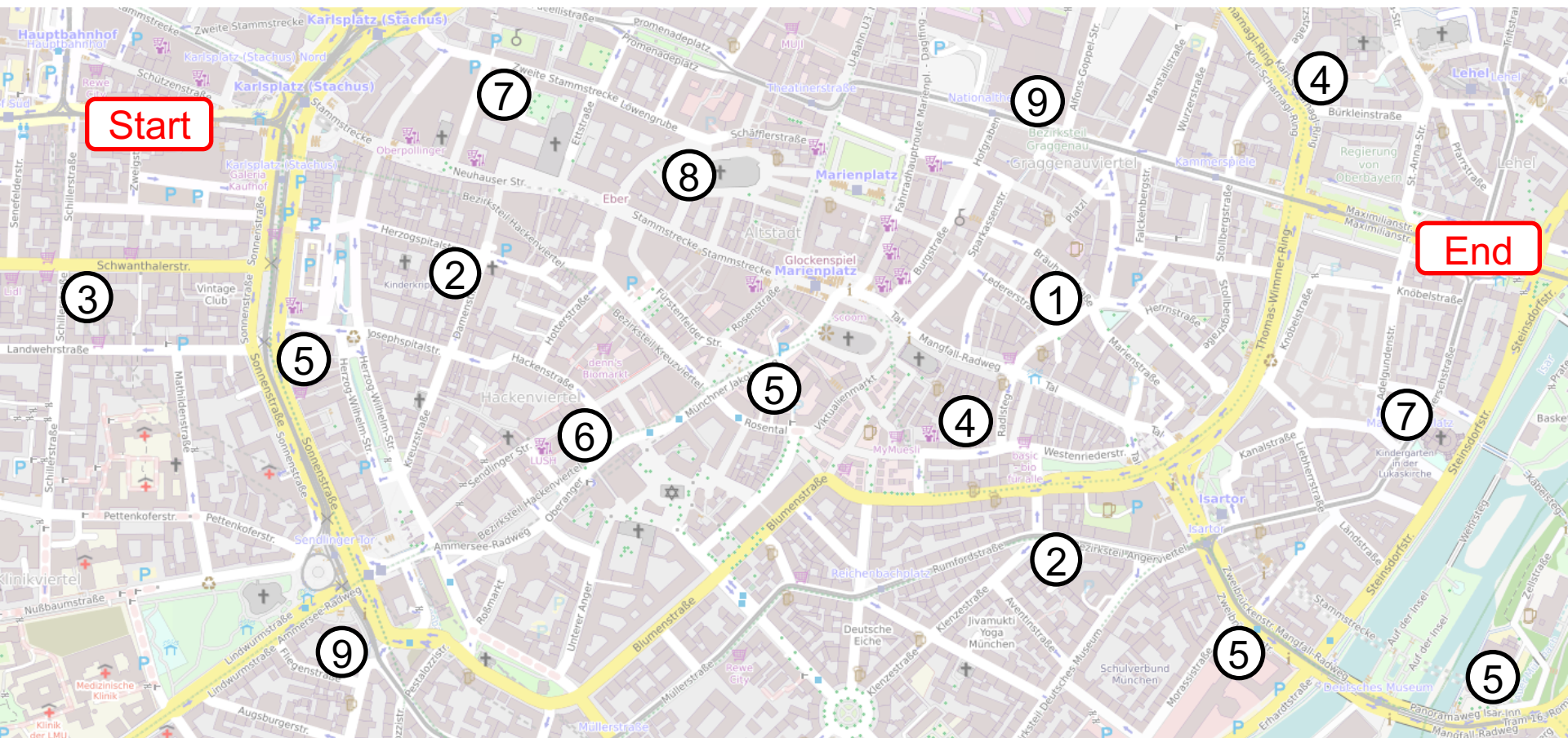
Daniel Herzog and Wolfgang Wörndl

RecTour 2016

September 15<sup>th</sup>, 2016



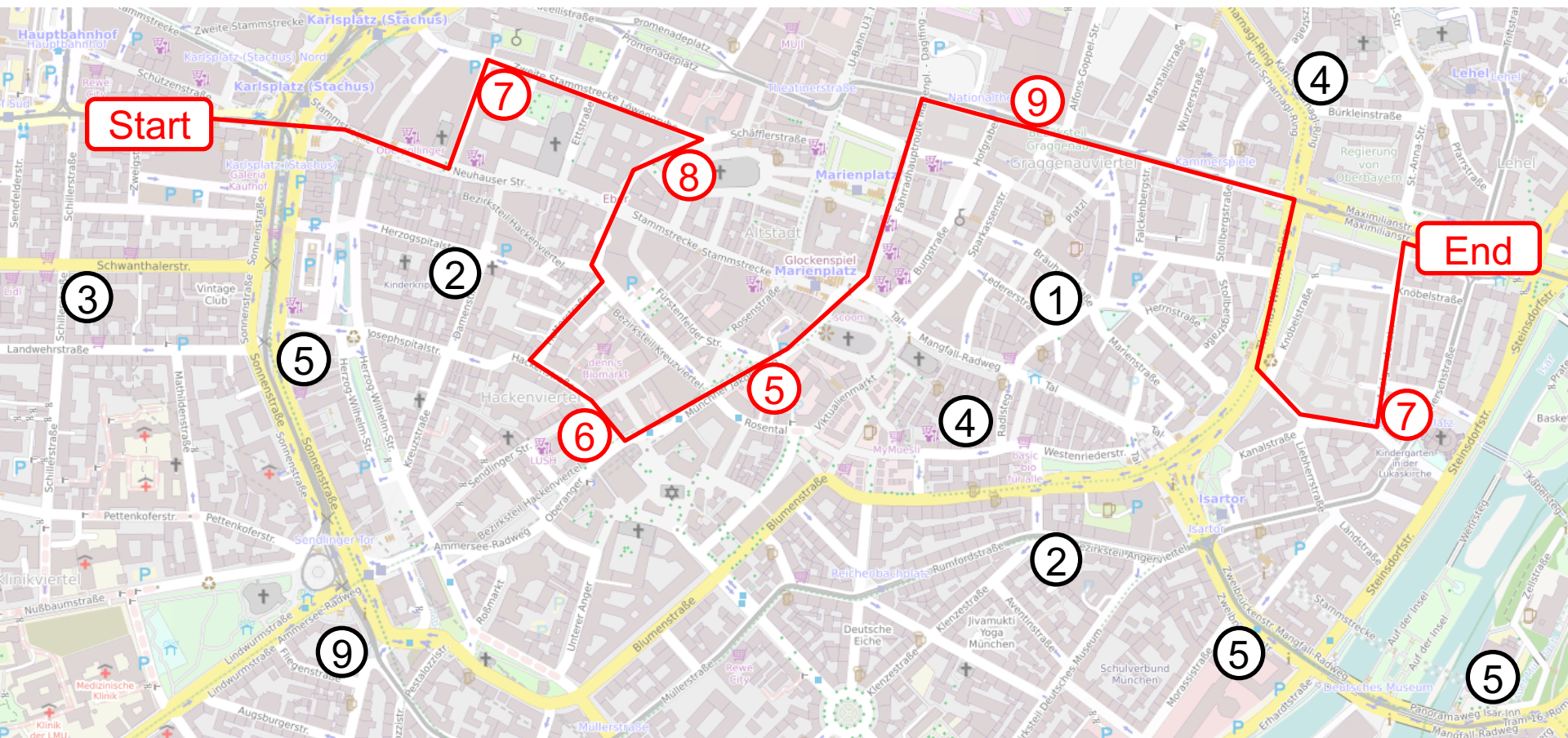
# How to Combine the Most Interesting Locations to a Tourist Trip?



© OpenStreetMap contributors



# How to Combine the Most Interesting Locations to a Tourist Trip?

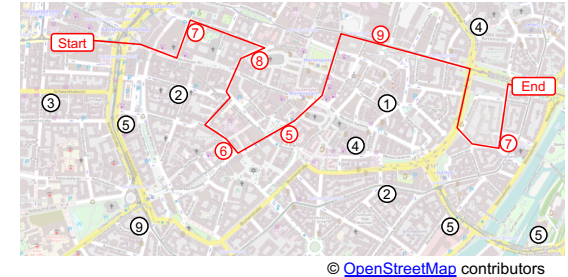


© OpenStreetMap contributors

# The Tourist Trip Design Problem

In the simplest specification, the TTDP is equal to the **Orienteering Problem (OP)**:

- A set of nodes with a value
- Each node can be visited once or not at all
- Time needed to travel between two nodes
- Find an itinerary that maximizes the overall value while not violating the limitations

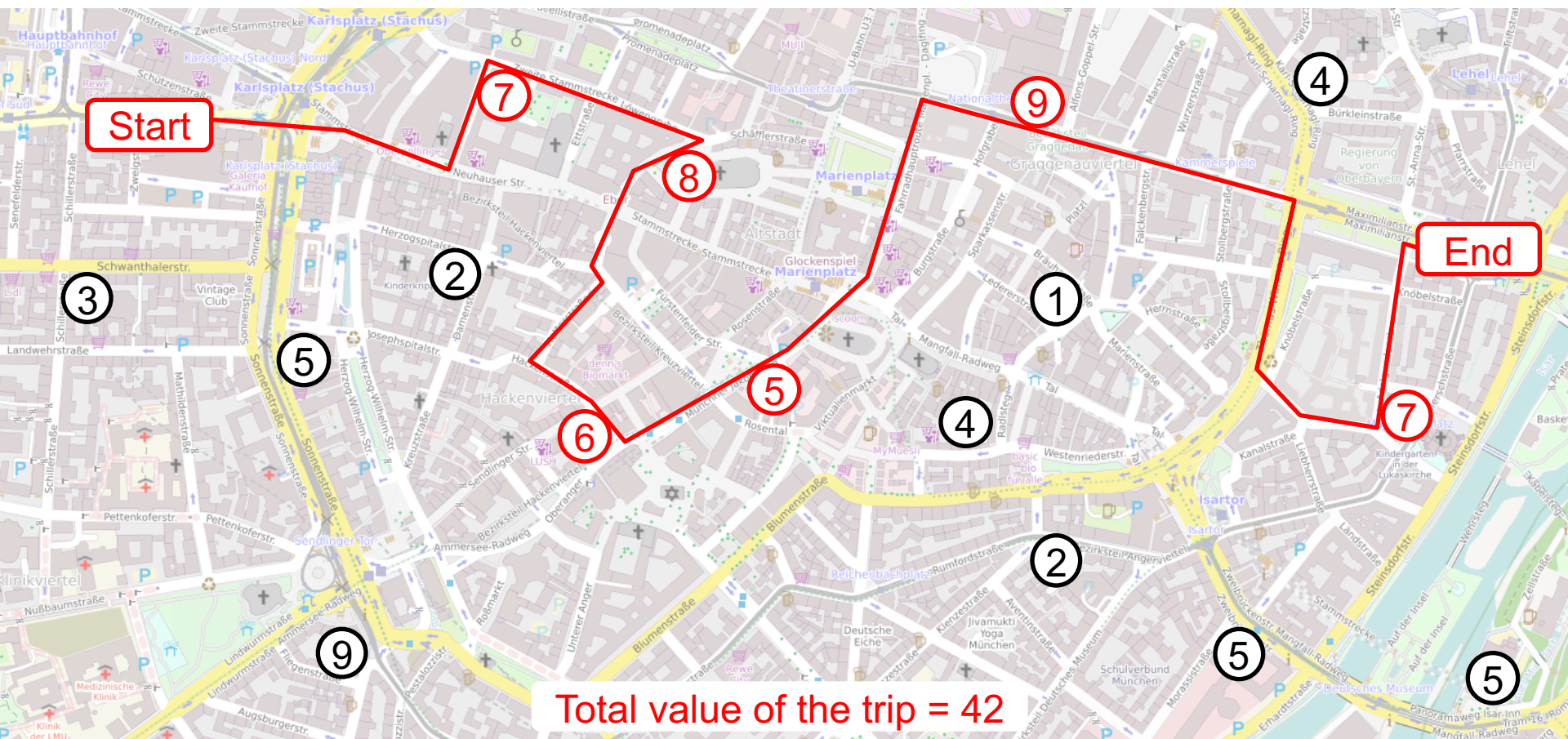


More complex variants exists:

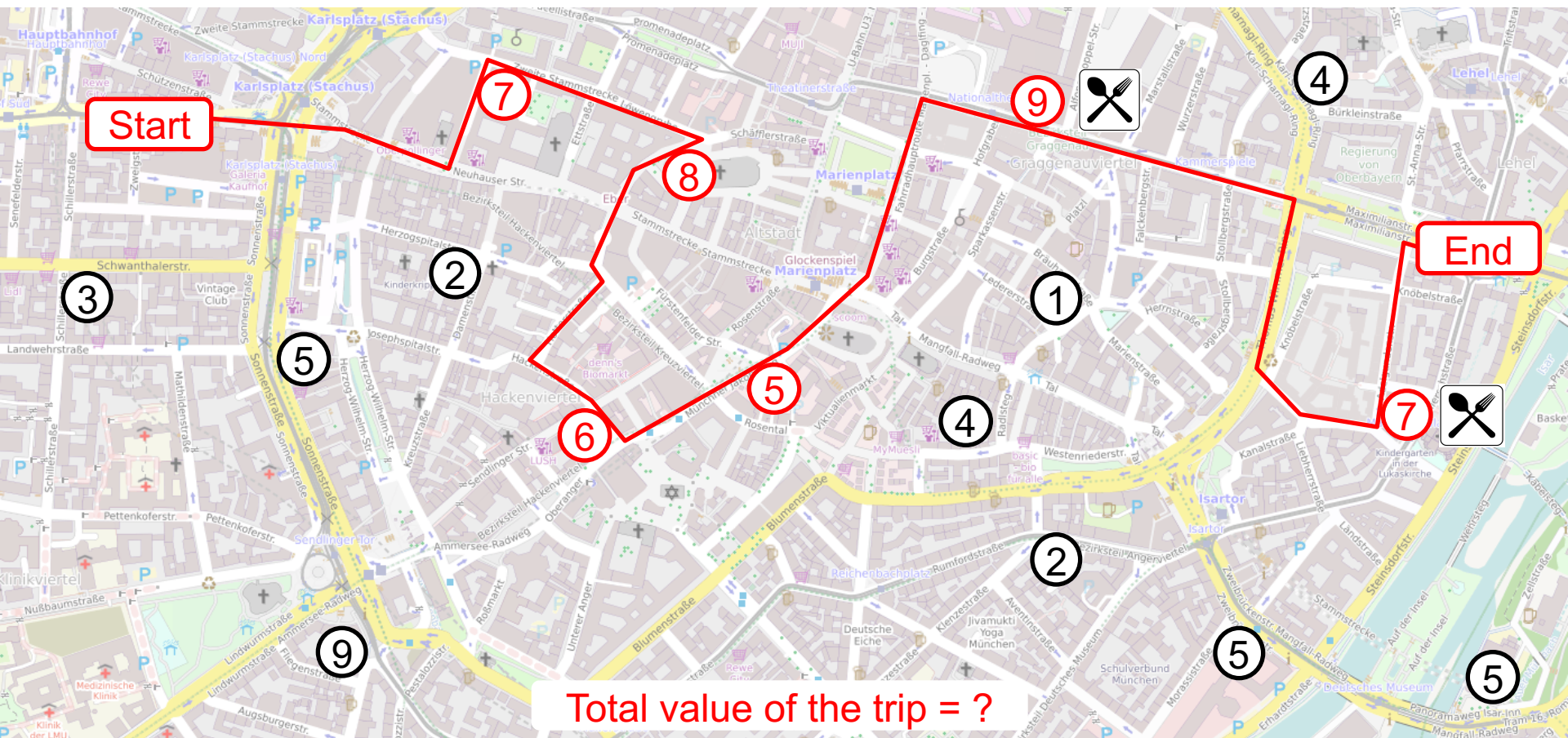
- Multiple tours
- Multiple constraints (time, budget, etc.)
- Opening times of POIs
- ...



# Is the Value of a Tourist Trip the Sum of the Single POIs' Values?



# Is the Value of a Tourist Trip the Sum of the Single POIs' Values?



# Recommending Tourist Trips

Tourist Trips are a special case in the field of **sequential recommendations**:

- The order of items is critical
- Some items cannot be afforded
- Items are POIs with certain characteristics (e.g., the POI type) and not only nodes with a fixed value
- The presence or absence of POIs in a sequences influence the value of other POIs in the same trip
- The user satisfaction is not the sum of the values of every POI

The user wants an enjoyable, consistent trip composed of an interesting and reasonable combination of POIs!



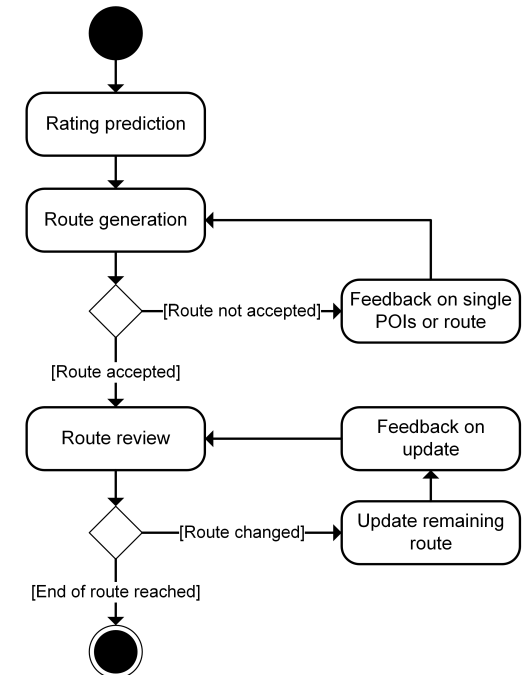
# Interesting Research Directions

## TTDP heuristics and item dependencies:

- Extend existing TTDP heuristics
- Implement the heuristics in tourist trip RSs
- Compare different approaches in user studies

## Providing feedback on sequential recommendations:

- Development of improved user interfaces for mobile devices
  - Feedback on single items
  - Feedback on the overall sequence and the ordering of items
  - Feedback on appreciated / unwanted combinations of items
- Iteratively improve recommendations (e.g., by using conversational RS)
- Examine the role of implicit feedback when recommending / updating trips
- Update the user's profile by learning personal item dependencies





Thank you very much for your attention!

Do you have any questions?

Daniel Herzog and Wolfgang Wörndl

RecTour 2016

September 15<sup>th</sup>, 2016

