## THE SYSTEM FOR TRIP PLANNING

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Planning a trip especially consisting of a few destinations when a person likes to explore different places rather than staying at one can be not quite a trivial task to manage.

There is no single ready to be used method that can help to provide suggestions on a trip destinations, route based on the preferences, but a combination of some methods can solve the problem. The methods are linear additive convolution with normalizing factors and weights and on some steps without weights [1], combinations and the travelling salesman problem [2]. At first the countries and the cities need to be rated and chosen based on the user's preferences using the linear convolution. Then the countries and then the chosen countries' cities are combined to some sets. Then the travelling salesman problem should be solved to access every combination and directions within it, find the best direction for each set considering price and distance between the cities. The last step would be the final assessment of the prepared combinations using the linear convolution in order to receive the final rate for each option.

The goal of this article is to design the system for trip planning, its components that need to be implemented. The general idea of the system is to get the user's preferences in a variety of trip's factors and based on them suggest a few trips with the set amount of destinations. Since the system should not only provide the suggestion, but also to support the users on their way within the suggested trips it is required to implement a mobile app so that the user can have some required information even when there is no Internet connection.

However, the trip suggestion and the data processing by the algorithm must happen while staying connected to the Internet in order for the required data processing by the algorithm could happen on the server which will need to have all the required data about the countries and cities. So the server side of the system should have implemented linear additive convolution with normalizing factors and weights and without weights too as well as combinatorics and the solution to a the travelling salesman problem.

The mentioned methods will be used by following the described earlier algorithm to find the best solutions to the problem. The methods should be implemented to be independent and modular so that it could be easier to maintain the system, to modify the parts of the algorithm when there is a chance to make the algorithm better and try out an improved solution.

### References

1. Emelichev V., Pashkevich, A. On the linear convolution of criteria in vector discrete optimization. *Diskretnyĭ Analiz i Issledovanie Operatsiĭ. Seriya 2.* 2000.

2. Applegate D., Bixby R., Chvátal V., Cook W. The Traveling Salesman Problem. 2006. ISBN 978-0-691-12993-8.