ABSTRACT

Topicality: today there is no service which allows quickly find out optimal weights for trading portfolio components, despite the fact that mathematically the problem has long been solved.

It is also very difficult for novice traders to choose the assets that are part of the portfolio. Today, none of the analytical services of the foreign exchange market provides the user with a simple and, most importantly, mathematically reliable way to compose trading portfolio.

The aim of the study: the main target is to research and develop software architecture for decreasing the time spent on the portfolio creation by combining in one application clustering and optimization algorithms.

To achieve this goal, the **following tasks** were formulated:

– debug the ETL process;
– implementation of algorithms;
– compare efficiency of implemented algorithms;
– build flexible infrastructure;
– create API interfaces to transfer results of work to internal sources.
– create interfaces for receiving results of work of algorithms.

Object of research: the process of developing software for composing the optimal portfolio in the foreign exchange market.

Subject of research: clustering algorithms and optimization methods, software libraries of optimization and clustering algorithms, ways to combine clustering and mathematical optimization within one software application.

The scientific novelty of the results of the master's dissertation is that for the first time proposed architecture decision for building software for composing a trading portfolio, which, unlike others, provides the user with the expected result

with minimal time and the number of necessary actions to get started. The result was achieved by developing an upgraded optimization algorithm.

The practical value of the obtained results is that the implemented methods are combined within one application and are as easy to use for the user. Also implemented API-interface, through which the results of the algorithms can easily receive and use third-party services.

Relationship with working with scientific programs, plans, topics: work was performed at the Department of Automated Information Processing and Management Systems of the National Technical University of Ukraine «Kyiv Polytechnic Institute. Igor Sikorsky».

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