National Research University Higher School of Economics (Higher School of Economics/HSE)

Faculty of Computer Science

Bachelor's Programme Data Science and Business Analytics

01.03.02 Applied Mathematics and Computer Science

**Internship report**

Fulfilled by

Krsmanovich Marko

*(Surname, Given Name, Middle Name if any)*

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*(signature)*

**Checked by**

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| (job or academic title) | (*surname, initials)* | (signature) |

**Moscow, 2019**

**Outline for Internship Report**

1. Cover page, table of contents and number of the pages
2. Introduction including internship goals, tasks and contents:

**Internship goals** *(not to be changed)***:** consolidation, expansion and deepening of the theoretical knowledge and acquirement of initial practical skills in solving specific problems

**Tasks** (*not to be changed*)**:**

* 1. consolidation and deepening of the theoretical knowledge on the disciplines passed at the university;
  2. acquirement of information competence for the purpose of successful work in professional activities;
  3. obtaining skills of both independent and team work.

**Contents**

No name

CONTENT: Given the scheme of placement of goods in the store size N × M. It is divided into cells. Some products are damaged and need to be replaced. Cells are 2 × 1 in size, A price, and 1 × 1 in price B. Cells can be rotated, but not cut. What is the minimum amount to spend to replace the damaged goods on the scheme? (lay cells). New cells should not overlap any other cells. Initial requirments Basic knowledge of the subjects "Discrete mathematics" and "Algorithms and Data Structures" are required. Used technologies Python, C++ Evaluation criteria 4-5: built the correct graph model 6-7: implement the Ford-Fulkerson algorithm 8-10: detailed report with description of solution

1. Educational Internship Schedule (Plan)

|  |  |  |  |
| --- | --- | --- | --- |
| № | **Calendar period** | **Work Plan** | Internship Supervisor’s signature/ |
| 1 | 01.07.2019 | 1. Organizational (induction) meeting |  |
| 2 | 01.07.2019 | 2. Instructing on the requirements of labor protection, safety, fire safety and internal labor regulations |  |
| 3 | 01.07.2019 -13.07.2019 | 3. Fulfillment of Individual Assignment |  |
| 4 | 01.07.2019 -13.07.2019 | 4. Consultation |  |
| 5 | 14.07.2019 | 5. Preparation and submission of the Report |  |

1. Description of the learned materials

Getting into terminology and base theoretical material of flow networks

Deep knowledge and understanding of the Ford-Fulkerson algorithm was gained

Work with such method of discrete math as coloring

Known how to use the Ford-Fulkerson and others algorithm for finding maximal matching

Some new knowledge of object oriented programming in c++ and c++ containers

Practice in communication skills and teamwork

Experience of pair programming

Practice in asymptotic analysis of algorithms

1. Description of the results

We implemented a program, which allows us to solve required problem

1. Conclusion

We practice in code writing, knew some new algorithms and methods of solving programming and math tasks

Evolve our teamwork’s skills

1. Bibliography

Internet (Wikipedia.org and e.t.c)