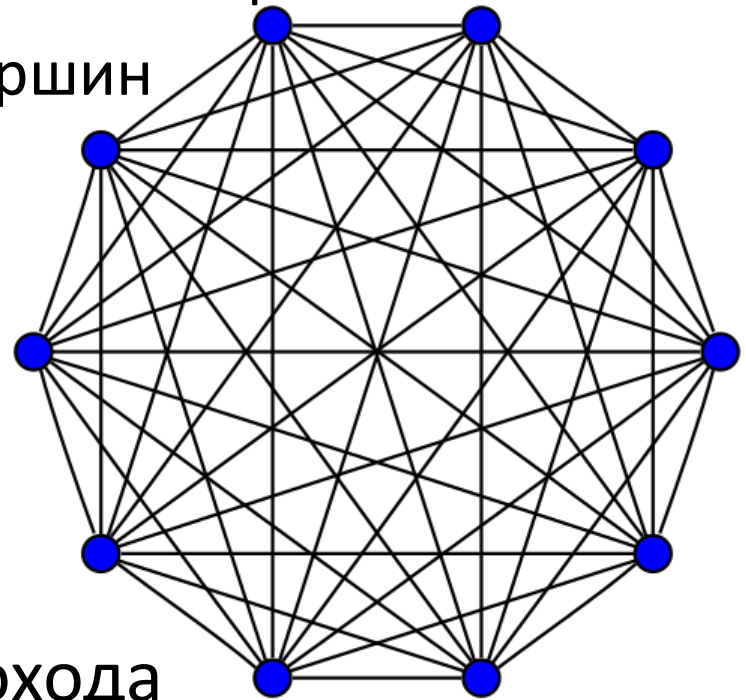# РЕШЕНИЕ ОПТИМИЗАЦИОННЫХ ЗАДАЧ С ИСПОЛЬЗОВАНИЕМ ГЕНЕТИЧЕСКИХ АЛГОРИТМОВ

Волобуев Василий, Повираева Марина, ИУ5-74

Задача

- Поиск кратчайшего пути для сообщения
 - Полносвязный граф из 10 вершин

- Минимизация времени прохода
  - Задана матрица весов путей

Интерфейс

```
Терминал                                                                              ⊖  ✖

GEN_ENDED
[0, 3, 1, 7, 7, 7, 7, 1, 4, 9] -> [0, 3, 1, 7, 7, 7, 7, 1, 4, 9] -> [0, 3, 1, 7, 7, 7, 7, 1, 4, 9] | 18->18
[0, 3, 6, 6, 6, 7, 7, 8, 4, 9] -> [0, 3, 6, 6, 6, 7, 7, 8, 4, 9] -> [0, 3, 6, 9, 6, 7, 7, 8, 4, 9] | 24->80
[0, 7, 7, 7, 7, 7, 7, 8, 4, 9] -> [0, 7, 7, 7, 7, 7, 7, 8, 4, 9] -> [0, 7, 7, 7, 7, 7, 7, 0, 4, 9] | 30->67
[0, 0, 8, 7, 8, 7, 7, 8, 4, 9] -> [0, 0, 8, 7, 8, 7, 7, 8, 4, 9] -> [0, 0, 8, 7, 8, 7, 7, 9, 4, 9] | 33->50
[0, 3, 2, 7, 7, 7, 7, 8, 8, 9] -> [0, 3, 1, 7, 7, 7, 1, 4, 9] -> [0, 3, 1, 7, 7, 7, 1, 1, 4, 9] | 37->18
[0, 3, 6, 7, 7, 7, 6, 8, 9] -> [0, 3, 1, 7, 7, 7, 7, 8, 4, 9] -> [0, 3, 1, 7, 7, 7, 7, 8, 2, 9] | 42->50
[0, 7, 6, 7, 7, 7, 8, 4, 9] -> [0, 7, 7, 7, 7, 7, 7, 1, 4, 9] -> [0, 7, 7, 2, 7, 7, 1, 4, 9] | 42->38
[0, 3, 6, 7, 6, 7, 7, 7, 4, 9] -> [0, 0, 8, 7, 8, 7, 7, 1, 4, 9] -> [0, 0, 8, 7, 8, 7, 7, 1, 9, 9] | 43->35
[0, 7, 7, 7, 7, 7, 7, 8, 1, 9] -> [0, 3, 6, 6, 6, 7, 7, 8, 4, 9] -> [0, 1, 6, 6, 6, 7, 7, 8, 4, 9] | 49->45
[0, 4, 7, 7, 7, 7, 7, 8, 4, 9] -> [0, 7, 7, 6, 6, 7, 7, 8, 4, 9] -> [0, 7, 7, 6, 6, 7, 1, 8, 4, 9] | 56->57
[0, 3, 6, 7, 3, 7, 7, 8, 4, 9] -> [0, 3, 8, 7, 8, 7, 7, 8, 4, 9] -> [0, 3, 8, 7, 9, 7, 7, 8, 4, 9] | 58->82
[0, 3, 2, 7, 6, 1, 7, 8, 4, 9] -> [0, 7, 7, 7, 7, 7, 7, 8, 4, 9] -> [0, 7, 7, 7, 7, 6, 7, 8, 4, 9] | 60->42
[0, 2, 1, 7, 1, 7, 7, 8, 4, 9] -> [0, 7, 7, 7, 8, 7, 7, 8, 4, 9] -> [0, 7, 7, 7, 8, 7, 7, 8, 4, 9] | 60->36
[0, 3, 6, 5, 7, 7, 7, 8, 4, 9] -> [0, 3, 2, 7, 7, 7, 7, 8, 8, 9] -> [0, 3, 6, 7, 7, 7, 7, 8, 8, 9] | 61->20
[0, 3, 6, 7, 7, 7, 7, 8, 6, 9] -> [0, 3, 6, 7, 7, 7, 7, 6, 8, 9] -> [0, 3, 2, 7, 7, 7, 7, 6, 8, 9] | 62->59
[0, 3, 6, 6, 6, 7, 7, 8, 6, 9] -> [0, 7, 6, 7, 7, 7, 7, 8, 4, 9] -> [0, 7, 6, 7, 7, 7, 8, 8, 4, 9] | 62->42
[0, 7, 7, 5, 7, 7, 7, 8, 4, 9] -> [0, 3, 6, 7, 6, 7, 7, 7, 4, 9] -> [0, 3, 6, 7, 6, 7, 1, 7, 4, 9] | 68->47
[0, 3, 6, 9, 7, 7, 7, 8, 4, 9] -> [0, 7, 7, 7, 7, 7, 7, 8, 1, 9] -> [0, 7, 7, 7, 7, 7, 7, 8, 1, 9] | 69->49
[0, 6, 6, 7, 0, 7, 7, 7, 4, 9] -> [0, 4, 7, 7, 7, 7, 7, 8, 4, 9] -> [0, 5, 7, 7, 7, 7, 7, 8, 4, 9] | 69->48
[0, 1, 8, 7, 6, 7, 6, 8, 4, 9] -> [0, 3, 6, 7, 3, 7, 7, 8, 4, 9] -> [0, 3, 6, 7, 5, 7, 7, 8, 4, 9] | 81->62
GEN_ENDED
REACHED NO-CHANGE LIMIT: 63/100
[0, 3, 1, 7, 7, 7, 7, 1, 4, 9] 18
EXP_ENDED
MAJOR STAT
[80, '[0, 3, 3, 3, 3, 5, 9, 9, 9, 9]', 19]
[50, '[0, 3, 3, 1, 1, 7, 7, 8, 9, 9]', 20]
[68, '[0, 0, 0, 0, 0, 0, 3, 1, 4, 9]', 14]
[60, '[0, 0, 0, 3, 3, 1, 1, 4, 9, 9]', 14]
[72, '[0, 3, 3, 3, 3, 3, 1, 4, 9, 9]', 14]
[64, '[0, 0, 8, 8, 8, 8, 8, 8, 8, 9]', 17]
[61, '[0, 3, 6, 6, 6, 7, 7, 8, 9, 9]', 20]
[89, '[0, 0, 3, 3, 3, 3, 1, 4, 4, 9]', 14]
[44, '[0, 3, 1, 4, 9, 4, 1, 4, 4, 9]', 22]
[63, '[0, 3, 1, 7, 7, 7, 7, 1, 4, 9]', 18]
>>> █
```
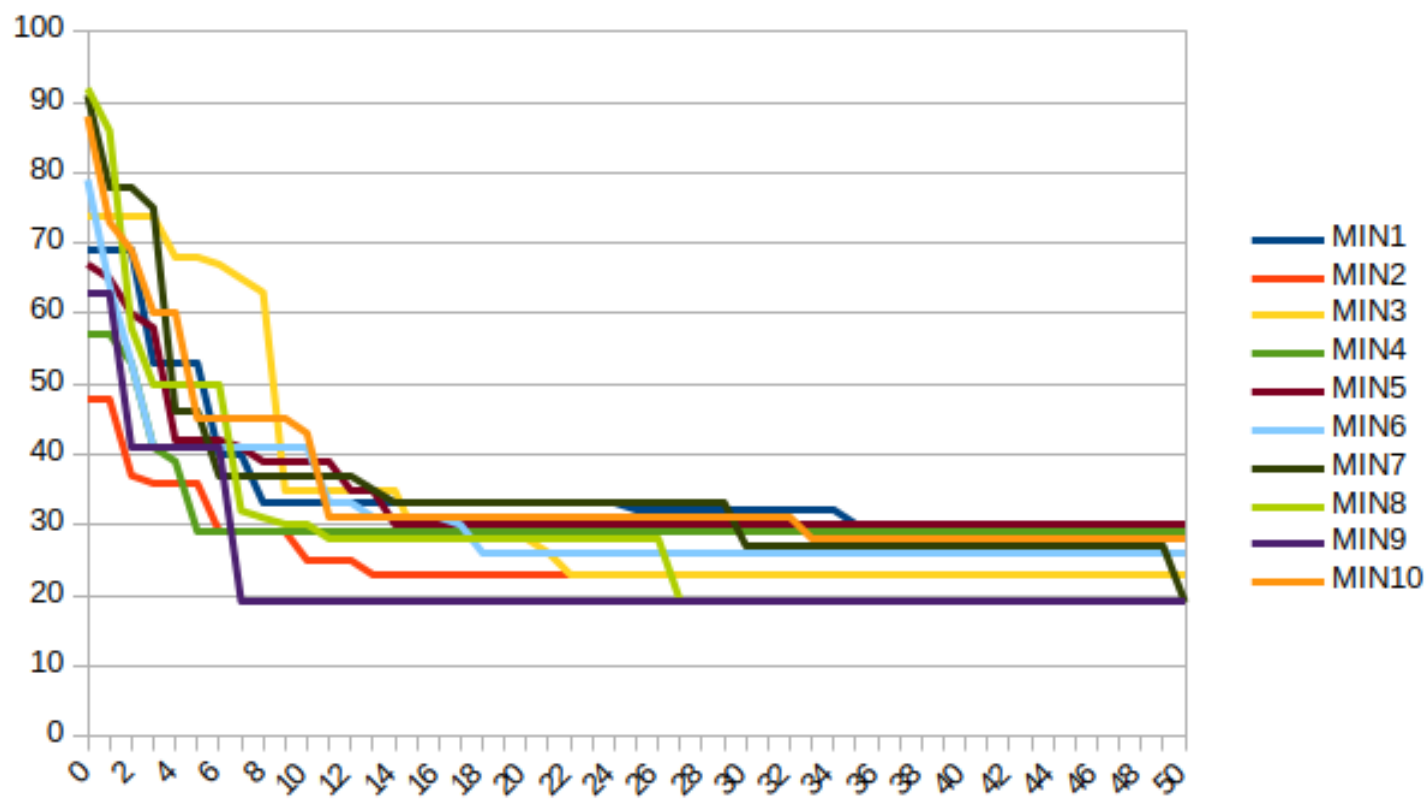
Блок-схема
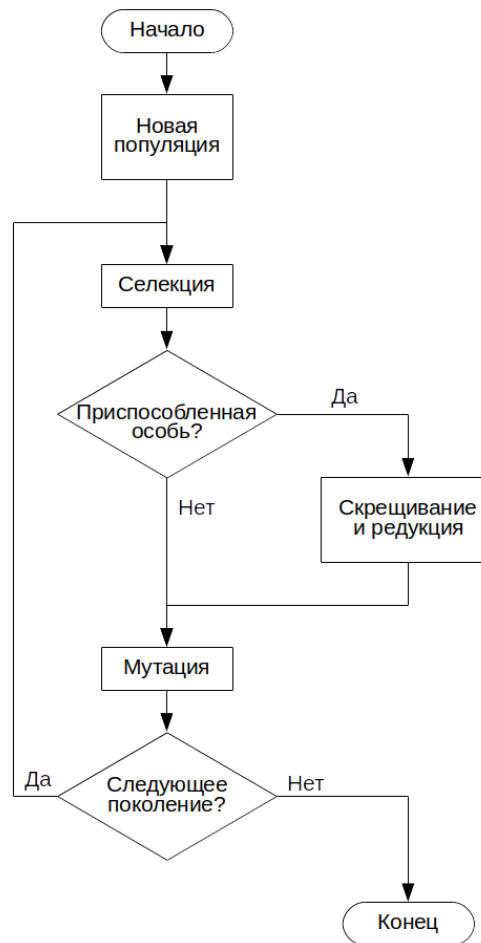
Результаты

Выводы

- Достаточная эффективность относительно полного перебора

- Проверку алгоритмом Дийкстры не проводили, а стоило бы

- Проблемы с зацикливанием
  - Требуются модицикации