МИНИСТЕРСТВО ОБРАЗОВАНИЯ И НАУКИ РОССИЙСКОЙ ФЕДЕРАЦИИ

Федерально автономное бюджетное образовательное учреждение высшего образования

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курс 3 группа ИС/б-31-о

09.03.02 Информационные системы и технологии (уровень бакалавриата)

ОТЧЕТ

по лабораторной работе №3

по дисциплине «Теория принятия решений»

на тему «Исследование применения теории важности критериев для решения задачи выбора альтернатив»

Отметка о зачете \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_

(дата)

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Севастополь 2016

1. Цель работы

Исследовать применение аппарата теории важности критериев при принятии решений по выбору альтернатив.

2. Постановка задачи

Вариант №3

Определить множество несравнимых решений , используя информацию об относительной важности критериев в следующем виде:

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| Варианты | Критерии | | | | |
|  |  |  |  |  |
|  | 3 | 5 | 5 | 4 | 4 |
|  | 4 | 4 | 4 | 5 | 4 |
|  | 5 | 4 | 3 | 3 | 5 |
|  | 3 | 5 | 3 | 5 | 3 |
|  | 4 | 2 | 4 | 5 | 5 |
|  | 3 | 5 | 3 | 5 | 3 |
|  | 5 | 3 | 4 | 3 | 4 |
|  | 4 | 5 | 3 | 4 | 3 |

3. Текст программы

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  | | --- | --- | | 1 | #include <iostream> | | 2 | #include <fstream> | | 3 | #include <iomanip> | | 4 |  | | 5 | #define EPS ((*double*) 1e-6) | | 6 |  | | 7 | using namespace std; | | 8 |  | | 9 | *double* abs(*double* *a*) { | | 10 | if(a < 0) { | | 11 | return -1\*a; | | 12 | } | | 13 | return a; | | 14 | } | | 15 |  | | 16 | *bool* eps\_e(*double* *a*, *double* *b*) { | | 17 | return abs(a - b) <= EPS; | | 18 | } | | 19 |  | | 20 | *bool* eps\_g(*double* *a*, *double* *b*) { | | 21 | return (a - b) > EPS; | | 22 | } | | 23 |  | | 24 | *bool* eps\_l(*double* *a*, *double* *b*) { | | 25 | return (b - a) > EPS; | | 26 | } | | 27 |  | | 28 | *void* recount(*double* \*\**k*, *int* *n*, *int* *m*) { | | 29 | for (*int* i = 0; i < n - 1; i++) { | | 30 | if (!k[i][0]) { | | 31 | continue; | | 32 | } | | 33 | for (*int* l = i + 1; l < n; l++) { | | 34 | if (!k[l][0]) { | | 35 | continue; | | 36 | } | | 37 | *int* cnt\_e = 0; | | 38 | *int* cnt\_g = 0; | | 39 | *int* cnt\_l = 0; | | 40 | for (*int* j = 1; j <= m; j++) { | | 41 | if (eps\_e(k[i][j], k[l][j])) { | | 42 | cnt\_e++; | | 43 | } else if (eps\_g(k[i][j], k[l][j])) { | | 44 | cnt\_g++; | | 45 | } else { | | 46 | cnt\_l++; | | 47 | } | | 48 | } | | 49 | if (cnt\_l == 0 && cnt\_g != 0 && cnt\_e != 0) { | | 50 | k[l][0] = 0; | | 51 | } | | 52 | if (cnt\_g == 0 && cnt\_l != 0 && cnt\_e != 0) { | | 53 | k[i][0] = 0; | | 54 | } | | 55 | } | | 56 | } | | 57 | } | | 58 |  | | 59 | *void* update(*double* \*\**k*, *int* *n*, *int* *m*, ifstream &*is*) { | | 60 | *int* l, a, b; | | 61 | *double* oa, ob; | | 62 | is >> l; | | 63 | for (*int* i = 0; i < l; i++) { | | 64 | is >> a >> oa >> b >> ob; | | 65 | if (oa < ob) { | | 66 | swap(a, b); | | 67 | swap(oa, ob); | | 68 | } | | 69 | *double* o = oa / (oa + ob); | | 70 | for (*int* j = 0; j < n; j++) { | | 71 | k[j][a] = o \* k[j][b] + (1.0 - o) \* k[j][a]; | | 72 | } | | 73 |  | | 74 | } | | 75 | } | | 76 |  | | 77 | *int* main() { | | 78 | ifstream is("input.txt"); | | 79 | *int* n, m; | | 80 | is >> n >> m; | | 81 | *double* \*\*k = new *double* \*[n]; | | 82 | for (*int* i = 0; i < n; i++) { | | 83 | k[i] = new *double*[m + 1]; | | 84 | k[i][0] = 1; | | 85 | for (*int* j = 1; j <= m; j++) { | | 86 | is >> k[i][j]; | | 87 | } | | 88 | } | | 89 |  | | 90 | recount(k, n, m); | | 91 |  | | 92 | update(k, n, m, is); | | 93 |  | | 94 | recount(k, n, m); | | 95 |  | | 96 | for (*int* i = 0; i < n; i++) { | | 97 | for (*int* j = 1; j <= m; j++) { | | 98 | cout << setw(4) << setprecision(2) << k[i][j] << " "; | | 99 | } | | 100 | cout << endl; | | 101 | } | | 102 | cout << endl; | | 103 |  | | 104 | for (*int* i = 0; i < n; i++) { | | 105 | if (k[i][0]) { | | 106 | cout << i + 1 << " "; | | 107 | } | | 108 | } | | 109 | cout << endl; | | 110 |  | | 111 | return 0; | | 112 | } | |  |

4. Результаты

На рисунке 4.1 представлен скриншот демонстрирующий работу написанной программы.

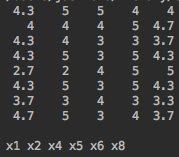


Рисунок 4.1 – Работа программы

Из рисунка 4.1 следует, что во множество несравнимых решений входят такие решения, как x1, x2, x4, x5, x6, x8, что является верным ответом.

Вывод

В ходе лабораторной работы было исследовано применение аппарата теории важности критериев при принятии решений по выбору альтернатив.