# *Applied Mathematics for Informatics*

# *Seminar 10*

**MADM**

A company engaged in the production of sets for mastering basic operations with SMD components can produce three types of sets (A, B, C - see assignment of past exercises).

This time, the company is in a situation where it has to make a decision, which production set to choose, and thanks to the analysis of production and the market environment, it has evaluated individual variants of production using 5 essential criteria, which are: production costs, revenues, average production speed, average production defect rate and customer satisfaction. The criterion matrix for evaluating production variants according to the above criteria is shown in the following table:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Production Cost (Kč/pc)** | **Revenues (Kč/pc)** | **Average speed of production (min/pc)** | **Average defects (%)** | **Customer Satisfaction** |
| **A** | 50 | 900 | 10 | 2 | high |
| **B** | 55 | 100 | 10 | 2 | medium |
| **C** | 70 | 150 | 15 | 3 | medium |
| **A+B** | 105 | 190 | 20 | 2 | very high |
| **B+C** | 125 | 240 | 25 | 2,50 | high |
| **A+C** | 120 | 250 | 25 | 2,50 | very high |
| **A+B+C** | 175 | 350 | 35 | 2,33 | very high |

**Questions:**

1) Quantify all qualitative assessments.

2) Determine the nature of the criteria.

3) Assess the dominance of individual variants.

4) Determine the weights of the criteria:

a. By the sequence method

b. By scoring method

c. Pairwise comparison method (Fuller's method)

d. Saaty's method of paired comparisons

5) Choose a compromise alternative:

a. By the standard level method

b. Scoring method with weights

c. By the simple additive weighting method