DISCRETE MATHEMATICS 1

THIRD LABORATORY EXERCISE

2022/2023

TASK

The defaults are natural numbers , , , ∈ .Let be a graph simple weight graph s vertices that are indexed by numbers of1to and let the edges of the graph and their weights be determined as follows. For peaks , ∈{1, ... , n}, < ,we say that they are adjacent vertices of the graph if and only if it is⌊| · -·|⌋differently from zero and in that case we take that number as the weight of the edge between the vertices and .Your task is to determine whether the given graph is connected and, if it is connected, find the minimum spanning tree of the graph and print the Prüfer code of that tree.

REMARK: number⌊ ⌋represents the largest whole real number .Your program is expected to work for inputs that satisfy , , , ≤ 100,but teachers may still ask you to enter test examples outside these limits.

ENTRANCE

In the executable file of the program, prompts for entering each of the parameters specified in the task should be printed. Each prompt appears in a new line after entering the previous parameter from the keyboard.

```
Enter a natural number n:5
Enter a natural number a:3
Enter a natural number b:1
Enter a natural number c:2
```

Example of program input (expressions marked in red should be able to be entered by the user independently)

EXIT

The program in the executable file should print the required tree property and the required Prüfer code.

```
Graf Gisconnected graph
Prufer's minimal spanning tree code:(5,2,3)
```

Example of program output (expressions marked in green are printed by the program, in this case for the previously mentioned inputs)

PROGRAMMING LANGUAGES

You may write the program in the programming language of your choice.

PROGRAM

The entire source code of the program (*source code*) must be in only one file, regardless of the number of structures, classes, functions or procedures used.

You teach the program in your laboratory exercise schedule published in the system. You can run the program on your own laptop or on a computer in the practicum, but in the other case, take care that the program must be able to be executed on these computers (there is appropriate software installed, etc.). We recommend that you test whether your program works on the computers in the practicals before handing it in.

SCORING

You can get a maximum of 5 points for this task. In addition to the accuracy of the program itself, the teacher may ask you some additional questions related to the program during the presentation, and it is expected that you can make minor changes to your program in order to calculate and print some additional things.

You are expected to independently design, implement and test your program. Using someone else's program or pseudocode is strictly prohibited.