Algorithms and Data Structures

Module 1

Assignment 1

Graph representations.

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Programming assignments

- Programming language: C++ (or C)
- Program should have command–line interface
  - ✓GUI is admissible but does not influence the score
- Data input and output via text files
- A solution for a programming assignment should include a zip file with:
  - ✓ a ‘Project’ folder, containing all necessary source (and header) files
  - ✓ an executable file (Release, Win32)
  - ✓ sample input and output files
  - ✓ a .bat file for running the program with command line arguments

Command line interface

```
Program1.exe In.txt 10 Out.txt
```

```
int main(int argc, const char * argv[])
{
    if (argc == 4)
    {
        // argv[0] = program file name
        string InputFile = argv[1];
        int BufLen = atoi(argv[2]);
        string OutputFile = argv[3];
        ...
        return 0;
    }
    else
    {
        cout << "Invalid number of arguments: " << argc << " instead of 3." << endl;
        return 1;
    }
}
```

Assignment 1. Graph representations

Design a program that reads an undirected graph description in edge list format and outputs the same graph representations as adjacency matrix and adjacency list.

The complete implementation of this assignment gives you 9 pts.

Assignment 1. Graph representations

Input:

- 1st line: a space separated list of vertex names
- Other lines: each line represents an edge (space separated vertex names).

```
Alice Eve David Bob Charlie
Alice Charlie
Alice David
Charlie Eve
David Charlie
```

Assignment 1. Graph representations

Output: 2 files

Adjacency matrix	Adjacency list
0 0 1 0 1 0 0 0 0 1 1 0 0 0 1 0 0 0 0 0 1 1 1 0 0	Alice: Charlie David Eve: Charlie David: Alice Charlie Bob: Charlie: Alice Eve David