

# Optical failure localization practical course

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# Task

- Identify the edges of the input graphs with as few m-trails as you can
- The winner will be that team who
  - Has solution for all the graphs
  - The total number of their m-trails (i.e., the sum of the number of m-trails required) is **minimal**

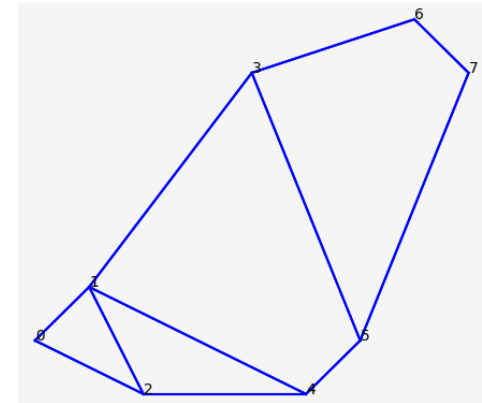
# Sample input

- Input file format: example on G8

```
8 //Number of nodes = n
0 1 1 0 0 0 0 0 //Adjacency matrix n x n
1 0 1 1 1 0 0 0
1 1 0 0 1 0 0 0
0 1 0 0 0 1 1 0
0 1 1 0 0 1 0 0
0 0 0 1 1 0 0 1
0 0 0 1 0 0 0 1
0 0 0 0 0 1 1 0
1 1 0 0 0 0 0 0 //incidency matrix n x m
-1 0 1 1 1 0 0 0 0 0 0 0
0 -1 -1 0 0 1 0 0 0 0 0 0
0 0 0 -1 0 0 1 1 0 0 0 0
0 0 0 0 -1 -1 0 0 1 0 0 0
0 0 0 0 0 0 -1 0 -1 1 0 0
0 0 0 0 0 0 0 -1 0 0 1 0
0 0 0 0 0 0 0 0 -1 -1 0 0
2 4 //coordinates of the nodes on the plane| n x 2
3 5
4 3
6 9
7 3
8 4
9 10
10 9
```

# Sample output (for G8)

- First line: your Neptun codes
- Matrix:
  - Rows correspond to edges
  - Columns correspond to m-trails



```
#neptun1 neptun2
```

```
1 1 0 0 0 0 0 0
1 0 1 0 0 0 0 0
0 1 1 0 0 0 0 0
0 1 0 1 0 0 0 0
0 1 0 0 1 0 0 0
0 0 1 0 1 0 0 0
0 0 0 1 0 1 0 0
0 0 0 1 0 0 1 0
0 0 0 0 1 1 0 0
0 0 0 0 0 1 0 1
0 0 0 0 0 0 1 1
```

```
//edge 1
//edge 2
//etc.
```

```
#neptun
```

```
1 1 0 0 0 0 0 0
1 0 1 0 0 0 0 0
0 1 1 0 0 0 0 0
0 1 0 1 0 0 0 0
0 1 0 0 1 0 0 0
0 0 1 0 1 0 0 0
0 0 0 1 0 1 0 0
0 0 0 1 0 0 1 0
0 0 0 0 1 1 0 0
0 0 0 0 0 1 1 0
0 0 0 0 0 0 1 1
0 0 0 0 0 0 0 1
```

```
#neptun
```

```
1 1 0 0 0 0 0 0
1 0 1 0 0 0 0 0
0 1 1 0 0 0 0 0
0 1 0 1 0 0 0 0
0 1 0 0 1 0 0 0
0 0 1 0 1 0 0 0
0 0 0 1 0 1 0 0
0 0 0 1 0 0 1 0
0 0 0 0 1 1 0 0
0 0 0 0 0 1 1 0
1 0 0 0 0 1 0 0
1 0 0 0 0 0 0 1
```

```
#neptun
```

```
1 1 0 0 0 0 0
1 0 1 0 0 0 0
0 1 1 0 0 0 0
0 1 0 0 0 0 0
0 1 0 1 0 0 0
0 0 1 1 0 0 0
0 1 0 0 1 0 0
0 1 0 0 0 1 0
0 0 0 1 1 0 0
0 1 0 0 0 1 0
0 0 0 0 1 1 0
0 0 0 0 0 1 1
0 0 0 0 0 0 1
```

# Usage of mtrail.py

- `python3 mtrail_p3.py -g G8 -m M8_1`
  - In case of graph G8 and mtrail file M8\_1 it returns sum of the number of connected components of the columns in the mtrail file (in this case: 8)
- `python3 plot_p3.py -g G8 -m M8_1 -c 2`
  - Draws graph G8 with blue edges, and on top of it draws the edges from mtrail file M8\_1 column 2 with red
- `python3 plot_p3.py -g G8`
  - Draws graph G8