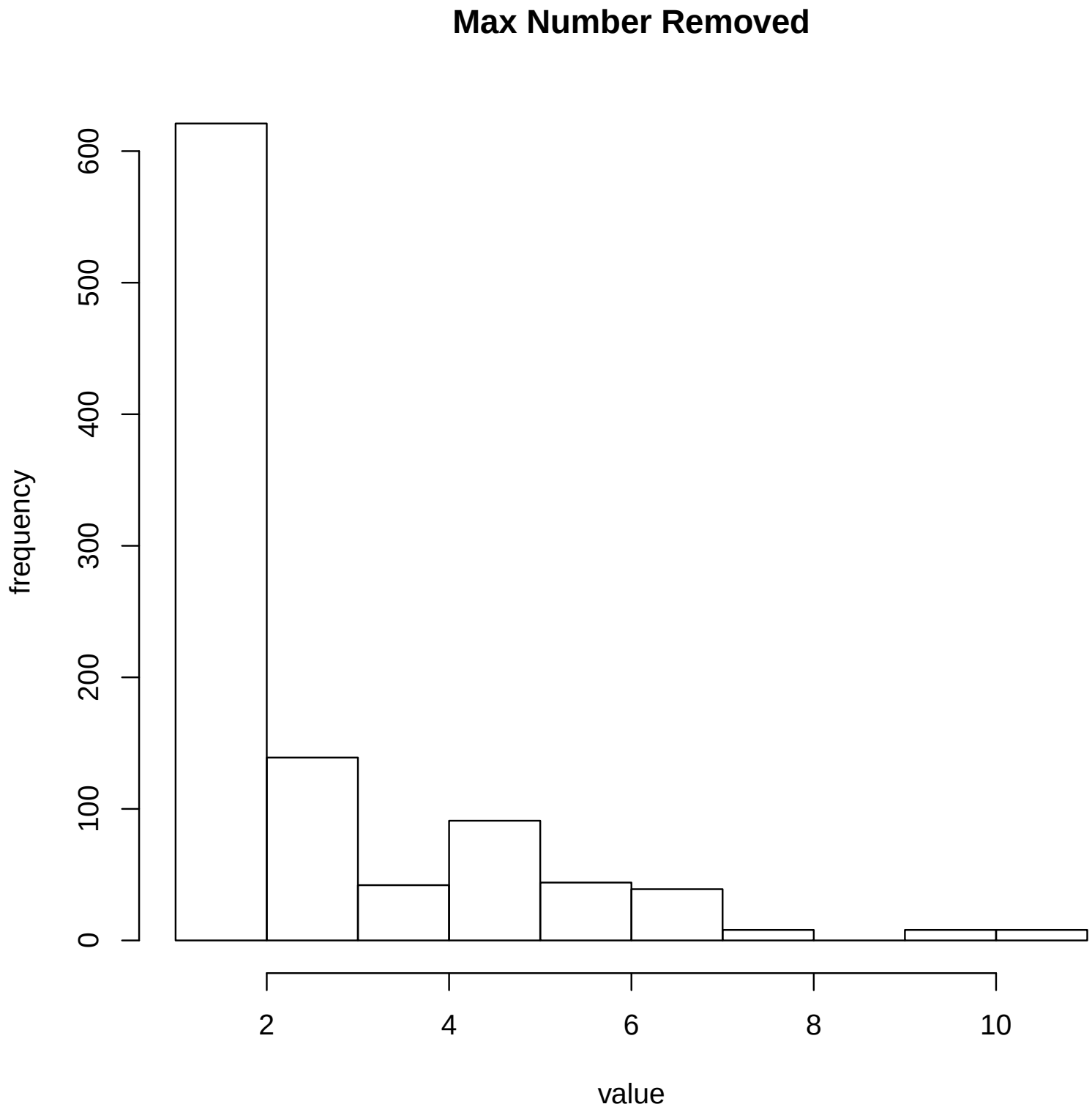
1. Testing:
   One sample output from a test run with command line arguments 5 10

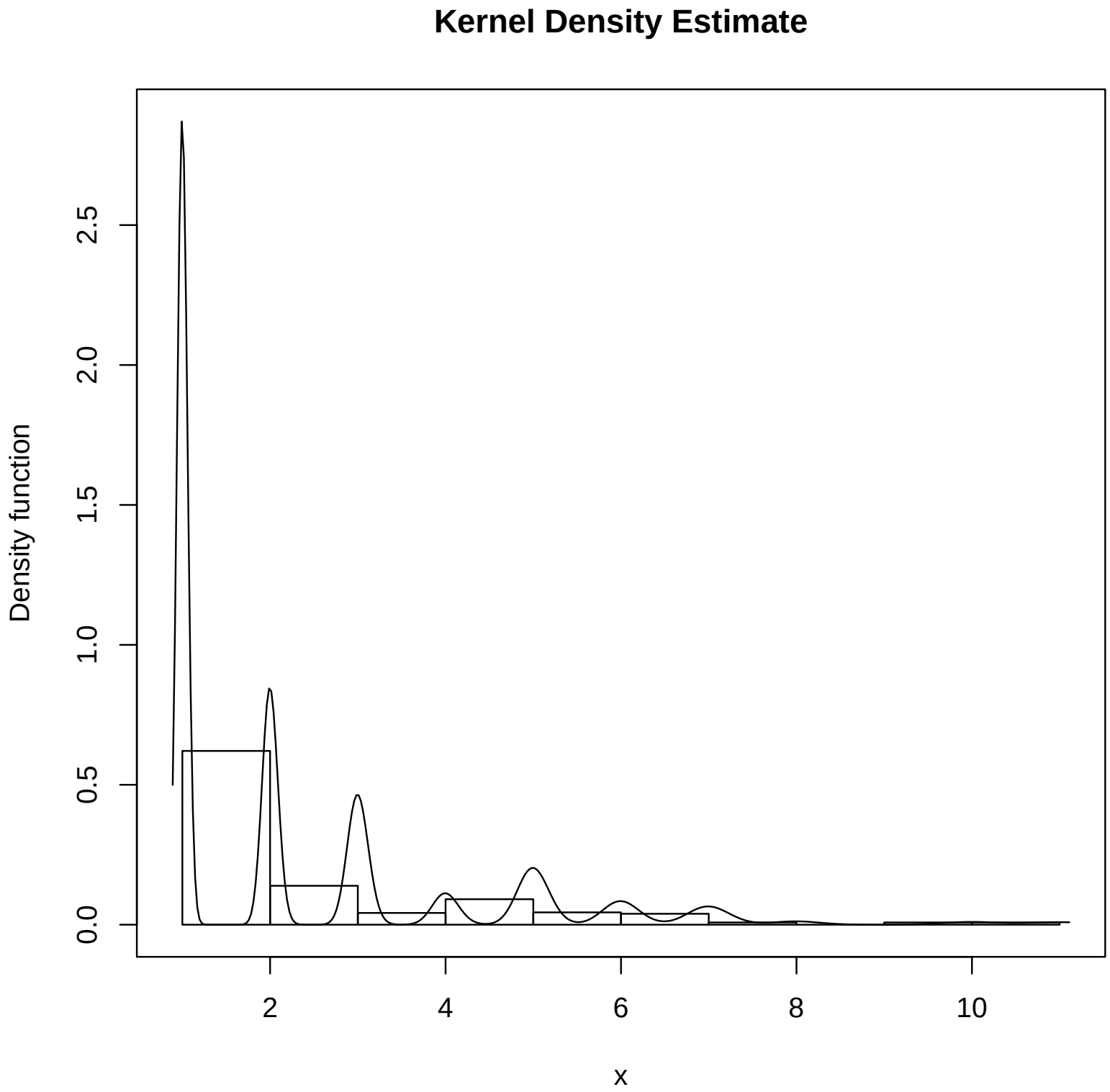
```
sum of degrees: 40
index: 0, degree: 5, adjacents: 1, 2, 3, 4, 14
index: 1, degree: 7, adjacents: 0, 2, 3, 4, 7, 8, 10
index: 2, degree: 5, adjacents: 0, 1, 3, 4, 13
index: 3, degree: 5, adjacents: 0, 1, 2, 4, 9
index: 4, degree: 6, adjacents: 0, 1, 2, 3, 5, 6
index: 5, degree: 2, adjacents: 4, 12
index: 6, degree: 1, adjacents: 4
index: 7, degree: 1, adjacents: 1
index: 8, degree: 1, adjacents: 1
index: 9, degree: 2, adjacents: 3, 11
index: 10, degree: 1, adjacents: 1
index: 11, degree: 1, adjacents: 9
index: 12, degree: 1, adjacents: 5
index: 13, degree: 1, adjacents: 2
index: 14, degree: 1, adjacents: 0

remove 11
sum of degrees: 38
index: 0, degree: 5, adjacents: 1, 2, 3, 4, 14
index: 1, degree: 7, adjacents: 0, 2, 3, 4, 7, 8, 10
index: 2, degree: 5, adjacents: 0, 1, 3, 4, 13
index: 3, degree: 5, adjacents: 0, 1, 2, 4, 9
index: 4, degree: 6, adjacents: 0, 1, 2, 3, 5, 6
index: 5, degree: 2, adjacents: 4, 12
index: 6, degree: 1, adjacents: 4
index: 7, degree: 1, adjacents: 1
index: 8, degree: 1, adjacents: 1
index: 9, degree: 1, adjacents: 3
index: 10, degree: 1, adjacents: 1
index: 12, degree: 1, adjacents: 5
index: 13, degree: 1, adjacents: 2
index: 14, degree: 1, adjacents: 0

remove 1
sum of degrees: 24
index: 0, degree: 4, adjacents: 2, 3, 4, 14
index: 2, degree: 4, adjacents: 0, 3, 4, 13
index: 3, degree: 4, adjacents: 0, 2, 4, 9
index: 4, degree: 5, adjacents: 0, 2, 3, 5, 6
index: 5, degree: 2, adjacents: 4, 12
index: 6, degree: 1, adjacents: 4
```

```
index: 7, degree: 0, adjacents: None
index: 8, degree: 0, adjacents: None
index: 9, degree: 1, adjacents: 3
index: 10, degree: 0, adjacents: None
index: 12, degree: 1, adjacents: 5
index: 13, degree: 1, adjacents: 2
index: 14, degree: 1, adjacents: 0

2
```

Note that the number following remove is the index in the Vertex list, not the index from the original graph, starting from 0.
The output shows correct execution of the program.

2. I conducted 1000 experiments with command line arguments 5 1000, see script test in the root directory.
See plots on the next two pages.
See output in pdata.csv in the root directory.
It's hard to determine probability distribution of the max number of vertices removed with a small number of trials. However, a large number of trials made it hard to fit a parametric model, so I did a KDE(Kernel Density Estimate).
The histogram shows that it is highly probable that the maximum number is one, since a lot of vertices are connected only to a hub vertex, and if the hub was removed, the graph could not be connected.


Max Number Removed
frequency
0
100
200
300
400
500
600
2
4
6
8
10
value


Kernel Density Estimate
Density function
0.0
0.5
1.0
1.5
2.0
2.5
2
4
6
8
10
x

3. Practical usages:

   (a) Social Network:

   - Vertices: Individual persons
   - Edges: Relationships between persons

   (b) Supply Chain Network:

   - Vertices: Individual cities
   - Edges: Connections between cities(All sorts of transportation)

   (c) Power Supply Network:

   - Vertices: Individual cities
   - Edges: Power lines between cities