

Comparison of Brute Force VS FPT implementation of Vertex Cover problem for varied input graphs

Comparison of running times for various number of vertices and various number of edges for each of those vertices:

| Number of vertices | Number of edges | parameter k | Yes/No instance | Brute force algorithm running time (seconds) | FPT algorithm running time (seconds) |
|--------------------|-----------------|-------------|-----------------|--|--------------------------------------|
| 20 | 107 | 3 | No | 0.036 | 0.014 |
| 20 | 102 | 6 | No | 1.317 | 0.016 |
| 20 | 89 | 10 | No | 5.513 | 0.017 |
| 20 | 58 | 12 | Yes | 1.249 | 0.0005 |
| 20 | 78 | 14 | Yes | 3.346 | 0.011 |
| 35 | 186 | 5 | No | 20.24 | 0.032 |
| 35 | 265 | 13 | No | 135.4 | 0.39 |
| 35 | 200 | 18 | Yes | 200.54 | 0.66 |
| 35 | 295 | 25 | Yes | 342.1 | 0.79 |
| 35 | 300 | 30 | Yes | 609.9 | 0.72 |
| 45 | 397 | 5 | No | 149.4 | 0.41 |
| 45 | 302 | 15 | Yes | 337.2 | 0.13 |
| 45 | 433 | 23 | Yes | 687.3 | 0.25 |
| 45 | 480 | 30 | Yes | 1023.2 | 0.62 |
| 45 | 502 | 38 | Yes | 1674.23 | 0.84 |