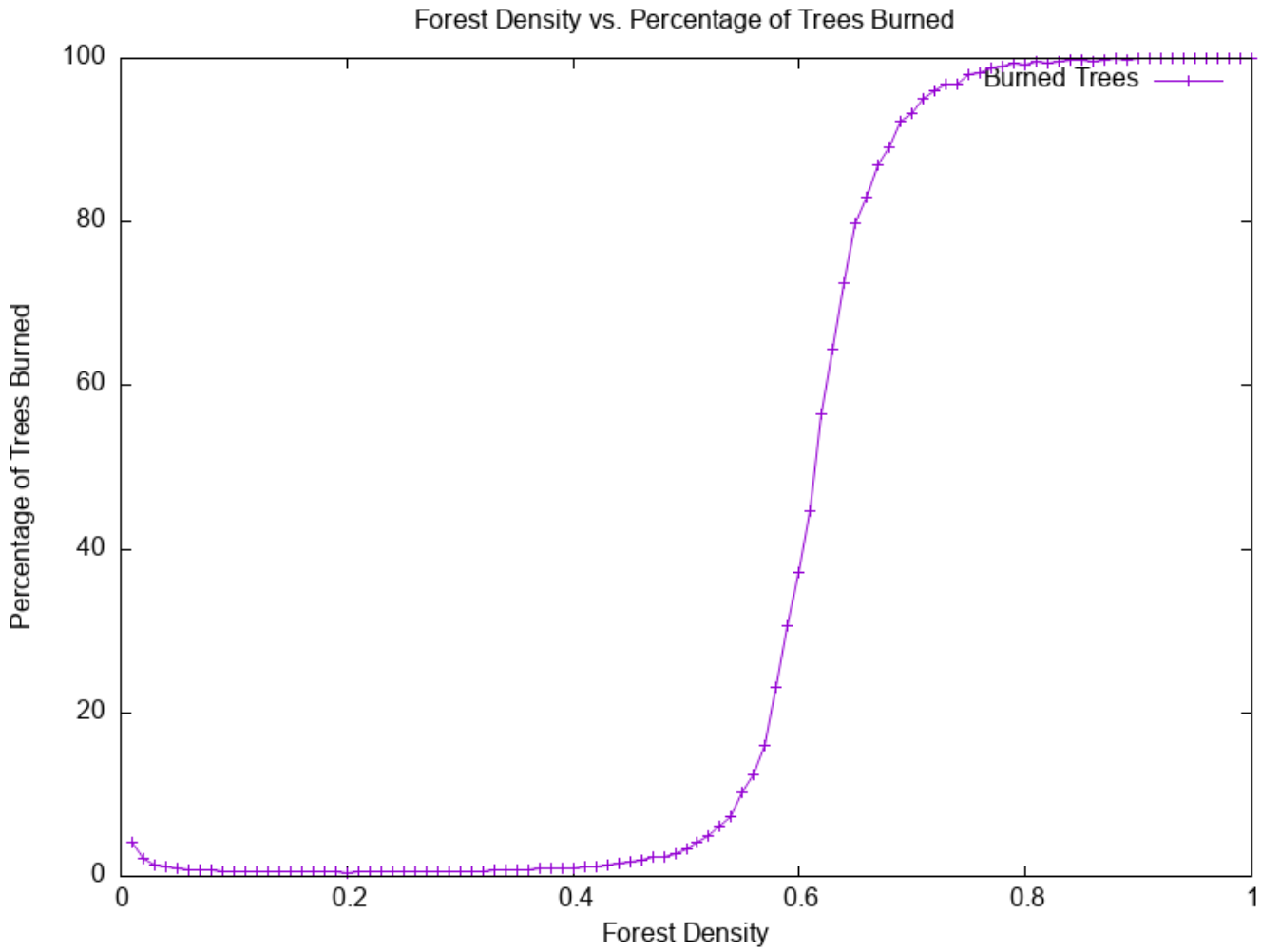
Program symulujący spalanie się lasu.

- flaga s określa rozmiar lasu (domyślnie 50).
- flaga d określa gęstość lasu (domyślnie 0.5).
- flaga r pozwala na uruchomienie programu wiele razy po naciśnięciu klawisza enter.
- flaga c uruchamia obliczanie średniej ilości spalonych drzew dla 1000 lasów o różnych gęstościach.

```
Percentage of trees burned: 1.46%
Average amount of burned trees for 1000 forests of size 50 and density 0.01: 4.16%
Average amount of burned trees for 1000 forests of size 50 and density 0.02: 2.16%
Average amount of burned trees for 1000 forests of size 50 and density 0.03: 1.50%
Average amount of burned trees for 1000 forests of size 50 and density 0.04: 1.19%
Average amount of burned trees for 1000 forests of size 50 and density 0.05: 0.98%
Average amount of burned trees for 1000 forests of size 50 and density 0.06: 0.85%
Average amount of burned trees for 1000 forests of size 50 and density 0.07: 0.77%
Average amount of burned trees for 1000 forests of size 50 and density 0.08: 0.71%
Average amount of burned trees for 1000 forests of size 50 and density 0.09: 0.65%
Average amount of burned trees for 1000 forests of size 50 and density 0.10: 0.62%
Average amount of burned trees for 1000 forests of size 50 and density 0.11: 0.59%
Average amount of burned trees for 1000 forests of size 50 and density 0.12: 0.56%
Average amount of burned trees for 1000 forests of size 50 and density 0.13: 0.53%
Average amount of burned trees for 1000 forests of size 50 and density 0.14: 0.53%
Average amount of burned trees for 1000 forests of size 50 and density 0.15: 0.54%
Average amount of burned trees for 1000 forests of size 50 and density 0.16: 0.52%
Average amount of burned trees for 1000 forests of size 50 and density 0.17: 0.53%
Average amount of burned trees for 1000 forests of size 50 and density 0.18: 0.52%
Average amount of burned trees for 1000 forests of size 50 and density 0.19: 0.49%
Average amount of burned trees for 1000 forests of size 50 and density 0.20: 0.53%
Average amount of burned trees for 1000 forests of size 50 and density 0.21: 0.52%
Average amount of burned trees for 1000 forests of size 50 and density 0.22: 0.50%
Average amount of burned trees for 1000 forests of size 50 and density 0.23: 0.54%
Average amount of burned trees for 1000 forests of size 50 and density 0.24: 0.53%
Average amount of burned trees for 1000 forests of size 50 and density 0.25: 0.56%
Average amount of burned trees for 1000 forests of size 50 and density 0.26: 0.58%
Average amount of burned trees for 1000 forests of size 50 and density 0.27: 0.57%
Average amount of burned trees for 1000 forests of size 50 and density 0.28: 0.58%
Average amount of burned trees for 1000 forests of size 50 and density 0.29: 0.63%
Average amount of burned trees for 1000 forests of size 50 and density 0.30: 0.65%
Average amount of burned trees for 1000 forests of size 50 and density 0.31: 0.65%
Average amount of burned trees for 1000 forests of size 50 and density 0.32: 0.71%
Average amount of burned trees for 1000 forests of size 50 and density 0.33: 0.74%
Average amount of burned trees for 1000 forests of size 50 and density 0.34: 0.76%
Average amount of burned trees for 1000 forests of size 50 and density 0.35: 0.78%
Average amount of burned trees for 1000 forests of size 50 and density 0.36: 0.84%
Average amount of burned trees for 1000 forests of size 50 and density 0.37: 0.89%
Average amount of burned trees for 1000 forests of size 50 and density 0.38: 0.96%
Average amount of burned trees for 1000 forests of size 50 and density 0.39: 0.98%
Average amount of burned trees for 1000 forests of size 50 and density 0.40: 1.11%
Average amount of burned trees for 1000 forests of size 50 and density 0.41: 1.20%
Average amount of burned trees for 1000 forests of size 50 and density 0.42: 1.35%
Average amount of burned trees for 1000 forests of size 50 and density 0.43: 1.44%
Average amount of burned trees for 1000 forests of size 50 and density 0.44: 1.51%
Average amount of burned trees for 1000 forests of size 50 and density 0.45: 1.66%
Average amount of burned trees for 1000 forests of size 50 and density 0.46: 1.90%
Average amount of burned trees for 1000 forests of size 50 and density 0.47: 2.23%
Average amount of burned trees for 1000 forests of size 50 and density 0.48: 2.59%
Average amount of burned trees for 1000 forests of size 50 and density 0.49: 2.85%
Average amount of burned trees for 1000 forests of size 50 and density 0.50: 3.29%
Average amount of burned trees for 1000 forests of size 50 and density 0.51: 4.23%
Average amount of burned trees for 1000 forests of size 50 and density 0.52: 4.77%
Average amount of burned trees for 1000 forests of size 50 and density 0.53: 6.43%
Average amount of burned trees for 1000 forests of size 50 and density 0.54: 7.54%
Average amount of burned trees for 1000 forests of size 50 and density 0.55: 9.72%
Average amount of burned trees for 1000 forests of size 50 and density 0.56: 13.16%
Average amount of burned trees for 1000 forests of size 50 and density 0.57: 15.52%
Average amount of burned trees for 1000 forests of size 50 and density 0.58: 21.13%
Average amount of burned trees for 1000 forests of size 50 and density 0.59: 30.75%
Average amount of burned trees for 1000 forests of size 50 and density 0.60: 37.92%
Average amount of burned trees for 1000 forests of size 50 and density 0.61: 47.46%
Average amount of burned trees for 1000 forests of size 50 and density 0.62: 56.05%
```

Wyniki zapisywane są do pliku `density_results.txt` i na ich podstawie generowany jest wykres `density_plot.png` przy użyciu gnuplota.



- wykres przedstawia procentową ilość spalonych drzew w zależności od gęstości zalesienia lasu
- przy 50% zalesienia lasu każde kolejne posadzenie drzewa diametralnie zwiększa szanse na pożar lasu
    - na wykresie widać że największy skok jest między 50% a 70% zalesienia
    - pniżej 50% zalesienia lasu pożary spalają bardzo małą ilość drzew
    - powyżej 70% zalesienia lasu pożary spalają większą część lasu
- warto też zauważyć, że przy bardzo małych gęstościach 1-4% zalesienia pożary są trochę bardziej poważne
    - dzieje się tak ponieważ program zawsze trafia w drzewo, a przy małych gęstościach zalesienia jest ich mniej

Podsumowanie:

Z programu wynika że najlepszym rozwiązaniem jest zalesienie lasu na poziomie 50%. Przy takiej gęstości lasy spalają się w 3.5% całego lasu. Zaskakujące jest jak dużą różnicę robi 1% zalesienia lasu gdy jest ono na poziomie 50%. Wtedy procent spalonych drzew drastycznie rośnie.