Computation, Problem Set #6, Numerical Differentiation, Integration, and Linear Constrained Optimization

OSM Lab, Jan Ertl

Due Tuesday, July 31 at 6:00pm

Do the following Exercises from the Brigham Young University Applied Mathematics and Computational Emphasis (ACME) Python labs Humpherys and Jarvis (2017) and from Richard Evans' notes.

1. **Exercises from ACME: Numerical Differentiation lab.** Do problems 1 through 7 from Numerical Differentiation lab. You will need to download the plane.npy file, which is saved in the course repository.

2. **Exercises from Evans: Numerical Integration lab.** Do exercises 14.1 through 14.9 from Numerical Integration lab.

3. **Exercises from ACME: Simplex Method lab.** Do problems 1 through 7 from Simplex Method lab. You will need to download the productMix.npz file, which is saved in the course repository.

4. **Exercises from ACME: Interior Point 1, Linear Programs lab.** Do problems 1 through 5 from Interior Point 1, Line Search Methods lab.

5. **Exercises from ACME: Newton and Quasi Newton Method lab.** Do problems 1 through 4 from Newton and Quasi Newton Method lab.

6. **Exercises from ACME: Iterative Solvers lab.** Do problems 1 through 7 from Iterative Solvers lab.

References

Humpherys, Jeffrey and Tyler Jarvis, "Computational Labs for Foundations of Applied Mathematics, Volumes I and II," 2017.