Assignment 3

Numerical Analysis by Maqsood Alam

Due date: 13/12/2020

Q1:- Consider the following integral

$$\int_{-2}^{2} 3^x dx$$

1. Use Trapezoidal rule with n = 6 to approximate the above integral.
2. Use Simpson's rule with n = 6 to approximate the above integral.
3. Use Simpson's 3/8 rule with n = 6 to approximate the above integral.
4. Use Boole's rule with n = 8 to approximate the above integral.
5. Use Weddle's rule with n = 10 to approximate the above integral.

Q2:- Use four iterations of Romberg integration to estimate $\int_1^2 \frac{1}{x} dx$

Q3:- Consider $\int_1^3 (x^6 - x^2 \sin(2x)) dx = 317.3442466.$

1. Use trapezoidal rule with n = 3 to approximate the integral.
2. Use Guassian quadrature method with n = 2.
3. Use Guassian quadrature method with n = 3.
4. Compare result from 1, 2, 3

Q4:- Implement weddle's method in python

Q5:- Modify Romberg's method so it stops after a desired accuracy.

Q6:- Solve Q1, Q2, Q3 using python.