Assignment 1: Present Value Calculator

The goal of this assignment is to introduce you to the power of functions within the R programming language as well as provide practice opportunities for basic programming techniques.

Build a present value function that is based on the following representations:

$$PV = \frac{Par}{\left(1+\frac{r}{n}\right)^{Tn}} \text{ and (Discrete Compounding)}$$

$$PV = Par\left(e^{-rT}\right), \text{ (Continuous Compounding)}$$

where *Par* denotes the future cash flow amount (e.g., *Par* = \$1,000), *T* denotes the time to maturity in years (e.g., *T* = 10.0), *r* denotes the interest rate in decimal (user inputs in percentage) (*r* = 0.05 in program, 5.0 as input), and *n* denotes number of compounding periods per year (e.g., *n* = 4, quarterly). With these inputs, we should get

$$PV = \frac{Par}{\left(1+\frac{r}{n}\right)^{Tn}} = \frac{1{,}000}{\left(1+\frac{0.05}{4}\right)^{10(4)}} = 608.4133 \text{ and (Discrete Compounding)}$$

Develop a test program that generates a variety of plots based on changing different inputs. For example, demonstrates the relationship between the number of compounding periods per year and the present value as a function of time to maturity. Selected plots are illustrated below.

PV as a function of number of periods per year **Difference between DC and CC and NPPY**