# EXISTENCE AND UNIQUENESS RESULTS FOR A CLASS OF FRACTIONAL BOUNDARY VALUE PROBLEM

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## Abstract

In this work a class of boundary value problem including fractional differential equation is studied. The existence and uniqueness of solution for a nonlinear fractional boundary value problem are discussed. This problem includes a nonlinear fractional differential equation of order $\alpha \in (0, 1]$ and fractional integral boundary conditions. In fact we consider the following boundary value problem of fractional differential equation

$$\begin{aligned} &{}^c\mathcal{D}^\alpha y(t) = f(t, y(t)) \qquad 0 < \alpha < 1, \quad t \in J := [0, T] \\ &y(0) + \mu \int_0^T y(s)ds = y(T), \end{aligned} \tag{1}$$

where ${}^c\mathcal{D}^\alpha$ denotes the Caputo fractional derivative of order $\alpha$, $f : J \times \mathbb{R} \to \mathbb{R}$ is given function will be specified later and $\mu \in \mathbb{R}$.
Banach contraction principle and Browder-Poter fixed point theorem will be used for proving existence and uniqueness of solution for that problem

**Keywords:** fractional differential equations, fractional integral condition, boundary value problemmama, fixed point.

## References

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