EECS-3401A

Introduction to AI & LP

York University

Fall 2022

Assignment #2

Widgets

General

For **Q1** through **Q7**, build **Prolog** procedures for **SWI Prolog** that work as specified.

Part I [20pt]: Dr. Dogfurry's Binary Tree

Dr. Dogfurry has desi . A “node” term looks like

- [bt(*integer*, *binar*
- []

The latter represents an guments are *binary-tree* nodes. Call

A binary-tree node can a *right-child* binary tree (the third argumen ty binary tree, `[]`, is placed there.)

E.g., `[bt(5, [], [bt(`

For the forllowing, you a proper binary tree, apropos Dr. Dogfu

- it is *finite* (that is
- if it is not the *em* d the next two arguments are pr
- that it is *ground*.

Q1. [5pt] `empty_bintree/1`

Write a procedure for `empty_bintree/1` that takes an argument `Tree`. It should return *true* if this is an *empty* binary tree, apropos Dr. Dogfurry's representation; and *false* (*fail*), otherwise.

The procedure should return *true* — with the appropriate additional behaviour — with an *unbound* variable for its argument.

Q2. [5pt] `bintree_contains/2`

Write a procedure for `bintree_contains/2` that takes two arguments, `Key` and `Tree`, in that order. The latter argument is *input*.

The procedure should evaluate *true iff* `Key` is equal to the *key* of any node in the *binary tree*