**PMAS Arid Agriculture University**

**University Institute of Information Technology**

**CS-632 Artificial Intelligence**

**Handout 07**

# Expert System

* Python Knowledge Engine (PyKE)
* Installation of PyKE
* PyKE test examples

## Python Knowledge Engine (PyKE)

PyKE is an expert system interpreter and coding framework that we will use to learn how to build and run a simple expert system.

For general information and background on PyKE, check out the Link:

<http://pyke.sourceforge.net/index.html>

## Installation of PyKE

1. Download pyke3-1.1.1.zip from <https://sourceforge.net/projects/pyke/files/pyke/1.1.1/>
2. Unzip pyke3-1.1.1.zip
3. Copy the folder to wherever you wish to work from (i.e., your working directory).
4. Open your computer's command line and navigate to the location of the copied PyKE folder (i.e., within the folder pyke-1.1.1 that contains the file 'setup'.
5. Run the following commands (one at a time) in your command line to build and install PyKE:
   1. python setup.py build
   2. python setup.py install
6. Take a look at the pyke example folder '/examples/family\_relations/'.
   1. Within that folder you should see 7 files including 'driver.py '
      1. There are three kinds of Pyke source files:
         1. .kfb files define fact bases
         2. .krb files define rule bases
         3. .kqb files define question bases
   2. Open and read the README files in this family\_relations folder for an explanation of the different files and a set of examples that may be run

## PyKE test examples

This 'driver.py' module was written as a PyKE example to conduct forward and backward chaining to determine the family relations between people.

* family.kfb is a fact base that includes family relationships that do not change and are always available to the system.
  + Only two types of relationships have been introduced by the creator of this expert system (daughter\_of, son\_of)
  + Facts are represented/coded in the following manner
    - daughter\_of(daughter, father, mother)
    - son\_of(son, father, mother)
  + Specific examples from this file include:
    - son\_of(matt, ralph, anne)
    - daughter\_of(sarah\_a, val, donna)
* This file will be utilized by the expert system in all the tests

## Use of PyKE

1. Create engine
   1. From pyke import knowledge\_engine
   2. My\_engine = knowledge\_engine.engine(\_file\_)
2. Activate Rule Bases
   1. My\_engine.activate(“rule base file”)
3. Prove goals
   1. From pyke import goals
   2. My\_goal=goal.compile(“goal”)

## Code:

import sys

import driver

driver.fc\_test{‘michael\_k’}

driver.fc\_test{‘ali’}

driver.fc\_test{}

driver.bc\_test{‘michael\_k’}

driver.bc\_test{‘gary’}

driver.bc\_test{}