

```

; vim: ts=2 sw=2 et :
(defvar *about*
  ("TINY (c) 2022, Tim Menzies"
   "Multi-objective semi-supervised XAI, in a few 100 lines."))

(defvar *options*
  '( (help nil      "-h"  "show help")
    (keep 256       "-k"  "items to keep")
    (k 1           "-k"  "nb low attributes classes")
    (m 2           "-m"  "nb low frequency classes")
    (seed 10019     "-s"  "random number seed")))

(defun cli (about lst)
  (dolist (four lst)
    (let* ((args #+clisp *args* #+sbcl *posix-argv*)
           (it (member (third four) args :test 'equal)))
      (if it (setf (second four)
                   (cond ((equal (second four) t) nil)
                         ((equal (second four) nil) t)
                         (t (thing (second it)))))))
    (when (second (assoc 'help lst))
      (format t "~&~%-[-a-%~]-%OPTIONS~%" about)
      (dolist (a lst)
        (format t " -a -7a -a-%" (elt a 2) (elt a 1) (elt a 3)))))

; =====
; ## Macro Short-cuts
; Some macros to handle some common short-cuts.

; (?? x:atom):atom ;; return an option
(defmacro ?? (x) `(second (assoc ',x *options*)))

; (? x:struct &rest slots:[atom]):atom ;; nested slot access
(defmacro ? (s x &rest xs)
  (if (null xs) `(slot-value ,s ',x) `(? (slot-value ,s ',x) ,@xs)))

; (aif test yes no) ;; anaphoric 'if' (remembering test results in 'it')
(defmacro aif (test yes &optional no)
  `(let ((it ,test)) (if it ,yes ,no)))

; A counter, implemented as an association list.
(defmacro incf (x a &optional (n 1))
  `(incf (cdr (or (assoc ,x ,a :test #'equal)
                  (car (setf ,a (cons (cons ,x 0) ,a))))
        ,n))

(defvar *seed* (?? seed))
(defun randi (&optional (n 1)) (floor (* n (/ (randf 1000.0) 1000))))
(defun randf (&optional (n 1.0))
  (setf *seed* (mod (+ 16807.0d0 *seed*) 2147483647.0d0))
  (* n (- 1.0d0 (/ *seed* 2147483647.0d0))))

; iterate 'f' over all items in 'file'
(defun reads (file f)
  (with-open-file (s file)
    (labels ((there () (here (read s nil)))
              (here (x) (when x (funcall f x) (there))))
      (there))))

(defun chars (x) (if (stringp x) x (symbol-name x)))
(defun charn (x) (char x (1- (length x))))
(defun char0 (x) (char x 0))

; =====
; ROWs keeps 1 record in "cell" and sets "used" if we access the "y" vals.
(defstruct row cells used)
; ROWS holds many records in "rows"; summarized in "cols".
(defstruct rows rows cols)
; COLS summarize the goal and independent columns in "x" and "y".
(defstruct cols (:constructor %make-cols) all x y names)

(defstruct col (n 0) (at 0) (txt "") (w 1) )
(defstruct (few (:include col)) kept ok (n 0) (max (?? keep)))
(defstruct (num (:include col)) kept (make-few))
(defstruct (sym (:include col)) kept)

(defun thing (x &aux (y (string-trim '("\Space #\Tab #\Newline") x)))
  (cond ((string= y "true")      "true")
        ((string= y "false")    "false")
        ((string= y "ignore-errors (read-from-string y)")
         (t (let ((z (ignore-errors (read-from-string y))))
              (if (numberp z) z y))))))

(defmethod add ((n num) x &optional (inc 1))
  (unless (eql ? x)
    (loop repeat inc
      do (incf ? c inc)
        (add (? n kept) x))))

(defmethod add ((s some) x)
  (incf (? s n))
  (let ((size (length (? s kept))))
    (cond ((< (length (? s kept)) (? s max))
           (push-vector-extend x (? s kept)
                               (? s ok)
                               ((< (randf) (/ (? s n) (? s max)))
                                (let ((pos (randi size)))
                                  (setf (elt (? s kept) pos) x
                                        (? s ok) t))))))
          (t (let ((pos (randi size)))
                (setf (elt (? s kept) pos) x
                      (? s ok) t))))))

(defmethod kept (s) (? s kept))
(defmethod kept ((s some))
  (if (not (? s ok)) (sort (? s kept) '<))
  (setf (? s ok) t)
  (? s kept))

; ## Cols
(defun make-cols (names &aux (cols (%make-cols :names (mapcar 'chars names))))
  (let ((at -1))
    (dolist (txt (? cols names) cols)
      (let ((col (if (uppercase-p (char0 txt))
                     (make-num :at (incf at) :txt txt)
                     (make-sym :at (incf at) :txt txt))))
        (push col (? cols all))
        (setf (? cols w) (if (eql #- (charn txt)) -1 1))
        (unless (eql (charn x) $v)
          (if (eql #- (charn txt)) (setf (? cols klass) col)
            (if (member (charn txt) '($! #- $+))
                (push col (? cols y))
                (push col (? cols x)))))))

(defmethod add ((c cols) (r row))
  (dolist (slot '(x y) r)
    (dolist (col (slot-value c slot))
      (add col (elt (? row cells) (? col at))))))

; ## ROWS
(defmethod add ((i rows) (r cons)) (add i (make-row :cells r)))
(defmethod add ((rs rows) (r row)) i
  (if (? rs cols)
    (push (add (? i cols) r) (? rs rows))
    (seff (? rs cols) (make-cols r))))

(cli *about* *options*)
(print *options*)

```