ETF MODEL + feature -- attributes list: ARRAY[CLASS OBJ] -- an array that holds the class objects made by the user user mode: INTEGER -- 1: setup, 2: assignment instruction mode mode msg: STRING current class: STRING current cmd: STRING current attr: STRING error: STRING feature { NONE } -- initialization make create list.make empty -- initialization other variables feature -- model operations addition require: valid user mode add call chain(chain: ARRAY[STRING]) require: valid user mode, call chain not empty add class(cn: STRING) require: valid user mode, no duplicate class add command(cn: STRING; fn: STRING; ps: ARRAY[TUPLE[pn: STRING; ft: STRING]]) require: valid user mode, no duplicate feature exists, no duplicate parameters names valid param names add attribues(cn: STRING; fn: STRING; ft: STRING) require: valid_user_mode, no duplicate feature_exists add assignment instruction(cn: STRING; fn: STRING; n: STRING) require: valid user mode, feature exists, feature can be specified add query(cn: STRING; fn: STRING; ps: ARRAY[TUPLE[pn: STRING; pt: STRING]]; rt: STRING) require: class exists, no duplicate feature exists, parameters dont clash, valid return type, valid parameter types type check bool value(c: BOOLEAN) require: valid user mode: user mode = 2 + 13 other command ops feature -- queries get class: CLASS OBJ class exists(cn: STRING): BOOLEAN feature exists(cn: STRING; fn: STRING): BOOLEAN params names clash(ps: ARRAY[TUPLE[pn: STRING; pt: STRING]]): BOOLEAN get clashing names(ps: ARRAY[TUPLE[pn: STRING; pt: STRING]]): ARRAY[STRING] params names duplicates(ps: ARRAY[TUPLE[pn: STRING; pt: STRING]]): BOOLEAN get duplicate params names(ps: ARRAY[TUPLE[STRING; STRING]]): ARRAY[STRING] params types invalid(ps: ARRAY[TUPLE[pn: STRING; pt: STRING]]): BOOLEAN get invalid params types(ps: ARRAY[TUPLE[pn: STRING; pt: STRING]]): ARRAY[STRING] return type invalid(ft: STRING): BOOLEAN feature -- OUT out: STRING

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CLASS OBJ
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feature -- attributes name: STRING

> attributes: ARRAY[ATTR OBJ] queries: ARRAY[QUERY OBJ] commands: ARRAY[COMMAND OBJ]

feature -- Constructor

make(n: STRING)

feature -- operations used by model class

add command(STRING; ARRAY[TUPLE]])

add attribute(fn: STRING; ft: STRING)

add query(fn: STRING; ps: ARRAY[TUPLE[]]; rt: STRING)

feature -- queries

get name: STRING has feature: BOOLEAN has query: BOOLEAN has command: BOOLEAN

feature -- print method for prining the board

out : STRING

COMMAND OBJ

feature -- {NONE} name: STRING

LIST

params: ARRAY[TUPLE[]]

feature -- CONSTRUCTOR make(STRING, ARRAY[TUPLE[]])

feature -- print out: STRING

QUERY OBJ

feature -- {NONE} name: STRING params: ARRAY[TUPLE[]] return type: STRING

feature -- CONSTRUCTOR make(STRING, ARRAY[TUPLE[]],

STRING)

feature -- print out: STRING

ATTR OBJ

feature -- {NONE} name: STRING type: STRING

feature -- CONSTRUCTOR make(STRING, STRING)

feature -- print out: STRING

ETF MODEL ACCESS +

feature -- attribute m: ETF MODEL

create Result.make

invariant

m = mend