```
1: (* $Id: absyn.mli, v 1.2 2019-01-24 17:42:06-08 - - $ *)
 2:
 3: (*
 4: * Abstract syntax definitions for SB.
 6:
 7: type linenr
                     = int
8: type ident = string
9: type label = string
10: type number = float
11: type oper = string
12:
13: type printable = Printexpr of expr
14:
                     | String of string
15:
                     = Arrayref of ident * expr
16: and memref
17:
                    | Variable of ident
18:
                     = Number of number
19: and expr
20:
                     | Memref of memref
                     | Unary of oper * expr
21:
22:
                     | Binary of oper * expr * expr
23:
24: type stmt
                     = Dim of ident * expr
                     | Let of memref * expr
25:
26:
                     | Goto of label
27:
                     | If of expr * label
28:
                     | Print of printable list
29:
                     | Input of memref list
30:
31: type progline = linenr * label option * stmt option
33: type program = progline list
34:
```

```
1: (* $Id: etc.mli,v 1.1 2019-01-24 15:47:38-08 - - $ *)
2:
3: (*
4: * Main program and system access.
5: *)
6:
7: val warn : string list -> unit
8:
9: val die : string list -> unit
10:
11: val syntax_error : Lexing.position -> string list -> unit
12:
13: val usage_exit : string list -> unit
14:
15: val read_number : unit -> float
16:
```

```
1: (* $Id: etc.ml, v 1.1 2019-01-24 15:47:38-08 - - $ *)
 3: let execname = Filename.basename Sys.argv.(0)
 4:
 5: let exit_status_ref = ref 0
 6:
7: let quit () =
        if !Sys.interactive
8:
9:
        then Printf.printf "Quit: exit %d\n%!" !exit_status_ref
10:
        else exit !exit_status_ref
11:
12: let eprint_list message =
13:
        (exit_status_ref := 1;
14:
         flush_all ();
15:
        List.iter prerr_string message;
16:
         prerr_newline ();
17:
         flush_all ())
18:
19: let warn message = eprint_list (execname :: ": " :: message)
21: let die message = (warn message; quit ())
22:
23: let syntax_error position message =
        warn (position.Lexing.pos_fname :: ": "
25:
                :: string_of_int position.Lexing.pos_lnum :: ": "
26:
                :: message)
27:
28: let usage_exit message =
29:
        (eprint_list ("Usage: " :: execname :: " " :: message); quit ())
30:
31: let buffer : string list ref = ref []
33: let rec read_number () = match !buffer with
34:
        | head::tail -> (buffer := tail;
35:
                         try float_of_string head
36:
                         with Failure _ -> nan)
37:
        [] -> let line = input_line stdin
38:
                in (buffer := Str.split (Str.regexp "[ \\t]+") line;
39:
                    read_number ())
40:
```

```
1: (* Created Thu Jan 24 19:14:14 PST 2019 *)
2:
3: type variable_table_t = (string, float) Hashtbl.t
4: val variable_table : variable_table_t
5:
6: type array_table_t = (string, float array) Hashtbl.t
7: val array_table : array_table_t
8:
9: type unary_fn_table_t = (string, float -> float) Hashtbl.t
10: val unary_fn_table : unary_fn_table_t
11:
12: type binary_fn_table_t = (string, float -> float -> float) Hashtbl.t
13: val binary_fn_table : binary_fn_table_t
14:
15: type label_table_t = (string, Absyn.program) Hashtbl.t
16: val label_table : label_table_t
17: val init_label_table : Absyn.program -> unit
18: val dump_label_table : unit -> unit
```

```
1: (* $Id: tables.ml, v 1.3 2019-01-24 17:08:37-08 - - $ *)
 3: type variable_table_t = (string, float) Hashtbl.t
 4: let variable_table : variable_table_t = Hashtbl.create 16
 5: let _ = List.map (fun (label, value) ->
 6:
                       Hashtbl.add variable_table label value)
7:
                      ["e"
                            , exp 1.0;
8:
                       "eof", 0.0;
                       "pi" , acos ~-.1.0;
9:
                       "nan", nan]
10:
11:
12: type array_table_t = (string, float array) Hashtbl.t
13: let array_table : array_table_t = Hashtbl.create 16
15: type unary_fn_table_t = (string, float -> float) Hashtbl.t
16: let unary_fn_table : unary_fn_table_t = Hashtbl.create 16
17: let _ = List.map (fun (label, value) ->
18:
                       Hashtbl.add unary_fn_table label value)
19:
                      ["+"
                              , (~+.);
                       "-"
20:
                              , (~-.);
21:
                       "abs"
                              , abs_float;
                       "acos" , acos;
22:
23:
                       "asin" , asin;
24:
                       "atan" , atan;
                       "ceil" , ceil;
25:
26:
                       "cos"
                              , cos;
                              , exp;
27:
                       "exp"
28:
                       "floor", floor;
                              , log;
29:
                       "log"
                       "log10", log10;
30:
31:
                       "\log 2" , (fun x -> \log x /. \log 2.0);
                       "round", (fun x \rightarrow floor (x + . 0.5));
32:
                              , sin;
33:
                       "sin"
                       "sqrt" , sqrt;
34:
35:
                       "tan" , tan]
36:
37: type binary_fn_table_t = (string, float -> float -> float) Hashtbl.t
38: let binary_fn_table : binary_fn_table_t = Hashtbl.create 16
39: let _ = List.map (fun (label, value) ->
40:
                       Hashtbl.add binary_fn_table label value)
                      ["+", (+.);
41:
42:
                       "-", (-.);
                       "*", ( *.);
43:
                       "/", (/.);
44:
                       "%", mod_float;
45:
                       "^", ( ** )]
46:
47:
```

```
48:
49: type label_table_t = (string, Absyn.program) Hashtbl.t
50: let label_table : label_table_t = Hashtbl.create 16
52: let rec init_label_table program =
53:
        let rec init program = match program with
54:
            | [] -> ()
55:
            | (_, Some label, _)::rest ->
56:
                  (Hashtbl.add label_table label program; init rest)
57:
            | _::rest -> init rest
58:
        in (Hashtbl.reset label_table; init program)
59:
60: let dump_label_table () =
        let dump key value = match value with
61:
62:
            | [] -> ()
63:
            | (line, _, _)::_ ->
64:
              Printf.fprintf stderr
65:
                  "label_table: \"%s\" -> line %d\n%!" key line
66:
        in Hashtbl.iter dump label_table
67:
```

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\$cmps112-wm/Assignments/asg2-ocaml-interp/code-interp dumper.mli

1/1

```
1: (* Created Thu Jan 24 19:14:14 PST 2019 *)
2: val quote : string -> string
3: val join : string -> string -> string -> string list -> string
4: val str_opt : ('a -> string) -> 'a option -> string
5: val str_ctor : string -> string list -> string
6: val str_list : ('a -> string) -> 'a list -> string
7: val str_printable : Absyn.printable -> string
8: val str_memref : Absyn.memref -> string
9: val str_expr : Absyn.expr -> string
10: val str_stmt : Absyn.stmt -> string
11: val dump_progline : int * string option * Absyn.stmt option -> unit
12: val dump_program : Absyn.program -> unit
```

```
1: (* $Id: dumper.ml, v 1.10 2019-01-24 19:14:14-08 - - $ *)
2:
3: open Absyn
 4:
 5: let quote string =
        let regex = Str.regexp "\""
6:
7:
        and subst _ = "\\\""
        in "\"" ^ Str.global_substitute regex subst string ^ "\""
8:
9:
10: let join start sep stop list =
11:
        let rec join' list' = match list' with
12:
            | [] -> stop
            | [unit] -> unit ^ stop
13:
            | head::tail -> head ^ sep ^ " " ^ join' tail
14:
15:
         in match list with
16:
            | [] -> start ^ stop
17:
            | _::_ -> start ^ join' list
18:
19: let str_opt str_fn item = match item with
        | None -> "None"
20:
        | Some thing -> "Some (" ^ str_fn thing ^ ")"
21:
22:
23: let str_ctor ctor args = join (ctor ^ " (") "," ")" args
25: let str_list str_fn list = join "[" ";" "]" (List.map str_fn list)
26:
```

```
27:
28: let rec str_printable printable = match printable with
        | Printexpr expr -> str_ctor "Printexpr" [str_expr expr]
30:
        | String string -> str_ctor "String" [quote string]
31:
32: and str_memref memref = match memref with
33:
        | Arrayref (ident, expr) ->
              str_ctor "Arrayref" [quote ident; str_expr expr]
34:
35:
        | Variable ident -> str_ctor "Variable" [quote ident]
36:
37: and str_expr expr = match expr with
        | Number number -> str_ctor "Number" [string_of_float number]
        | Memref memref -> str_ctor "Memref" [str_memref memref]
39:
        | Unary (oper, expr) -> str_ctor "Unary" [quote oper; str_expr expr]
40:
        | Binary (oper, expr1, expr2) ->
41:
42:
              str_ctor "Binary" [quote oper; str_expr expr1; str_expr expr2]
43:
44: let str_stmt (stmt: stmt) = match stmt with
45:
        | Dim (ident, expr) ->
              str_ctor "Dim" [quote ident ^ ", " ^ str_expr expr]
46:
47:
        | Let (memref, expr) ->
              str_ctor "Let" [str_memref memref; str_expr expr]
48:
49:
        | Goto label -> str_ctor "Goto" [quote label]
        | If (expr, label) -> str_ctor "If" [str_expr expr; quote label]
50:
51:
        | Print printable'list ->
52:
              str_ctor "Print" [str_list str_printable printable'list]
53:
        | Input memref'list ->
54:
              str_ctor "Input" [str_list str_memref memref'list]
55:
56: let dump_progline (linenr, label'opt, stmt'opt) =
57:
        Printf.fprintf stderr "%3d %s: %s\n%!" linenr
58:
            (str_opt (fun x -> x) label'opt)
59:
            (str_opt str_stmt stmt'opt)
60:
61: let dump_program (program : program) =
62:
        List.iter dump_progline program
63:
```

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```
1: (* $Id: interp.mli,v 1.5 2019-01-24 17:08:37-08 - - $ *)
2:
3: (*
4: * Interpreter for Silly Basic
5: *)
6:
7: val want_dump : bool ref
8:
9: val interpret_program : Absyn.program -> unit
10:
```

```
1: (* $Id: interp.ml, v 1.6 2019-01-24 19:14:14-08 - - $ *)
 2:
 3: open Absyn
 4:
 5: exception Unimplemented of string
 6: let unimpl reason = raise (Unimplemented reason)
7:
 8: let want_dump = ref false
9:
10: let rec eval_expr (expr : Absyn.expr) : float = match expr with
11:
        | Number number -> number
12:
        | Memref memref -> unimpl "eval_expr Memref"
        | Unary (oper, expr) -> unimpl "eval_expr Unary"
13:
        | Binary (oper, expr1, expr2) -> unimpl "eval_expr Binary"
14:
15:
16: let interp_print (print_list : Absyn.printable list) =
17:
        let print_item item =
            (print_string " ";
18:
19:
             match item with
20:
             | String string ->
21:
               let regex = Str.regexp "\"\\(.*\\)\""
22:
               in print_string (Str.replace_first regex "\\1" string)
23:
             | Printexpr expr ->
24:
               print_float (eval_expr expr))
25:
        in (List.iter print_item print_list; print_newline ())
26:
27: let interp_input (memref_list : Absyn.memref list) =
28:
        let input_number memref =
29:
            try let number = Etc.read_number ()
30:
                 in (print_float number; print_newline ())
31:
            with End_of_file ->
32:
                 (print_string "End_of_file"; print_newline ())
33:
        in List.iter input_number memref_list
34:
35: let interp_stmt (stmt : Absyn.stmt) = match stmt with
        | Dim (ident, expr) -> unimpl "Dim (ident, expr)"
37:
        | Let (memref, expr) -> unimpl "Let (memref, expr)"
38:
        | Goto labsl -> unimpl "Goto labsl"
39:
        | If (expr, label) -> unimpl "If (expr, label)"
40:
        | Print print_list -> interp_print print_list
41:
        | Input memref_list -> interp_input memref_list
42:
43: let rec interpret (program : Absyn.program) = match program with
44:
        | [] -> ()
45:
        | firstline::otherlines -> match firstline with
46:
          | _, _, None -> interpret otherlines
47:
          | _, _, Some stmt -> (interp_stmt stmt; interpret otherlines)
48:
49: let interpret_program program =
50:
        (Tables.init_label_table program;
51:
         if !want_dump then Tables.dump_label_table ();
52:
         if !want_dump then Dumper.dump_program program;
53:
         interpret program)
54:
```

```
1: (* $Id: main.ml, v 1.1 2019-01-24 15:47:38-08 - - $ *)
2:
 3: (*
 4: * Main program reads a file and prints to stdout.
 6:
7: let interpret_source filename =
8:
        try (let sourcefile =
                 if filename = "-"
9:
10:
                 then stdin
11:
                 else open_in filename in
12:
             let lexbuf = Lexing.from_channel sourcefile in
13:
             let abstract_syntax = Parser.program Scanner.token lexbuf in
14:
             Interp.interpret_program abstract_syntax)
15:
        with Sys_error (string) -> Etc.die [string]
16:
17: let _ = if !Sys.interactive
18:
            then ()
19:
            else match Array.length Sys.argv with
20:
                 | 1 -> interpret_source "-"
21:
                 | 2 -> interpret_source Sys.argv.(1)
22:
                 | _ -> Etc.usage_exit ["[filename.sb]"]
23:
```

```
1: /* $Id: parser.mly,v 1.1 2019-01-24 15:47:38-08 - - $ */
2:
 3: %{
 4:
 5: let linenr () = (symbol_start_pos ()).Lexing.pos_lnum
 6:
7: let syntax () = Etc.syntax_error (symbol_start_pos ()) ["syntax error"]
8:
9: %}
10:
11: %token <string> RELOP EQUAL ADDOP MULOP POWOP
12: %token <string> IDENT NUMBER STRING
13: %token COLON COMMA LPAR RPAR LSUB RSUB EOL EOF
14: %token DIM LET GOTO IF PRINT INPUT
15:
16: %type <Absyn.program> program
17:
18: %start program
19:
20: %%
21:
22: program : stmt_list EOF
                                          {List.rev $1}
24: stmt_list : stmt_list stmt EOL
                                          {$2::$1}
               | stmt_list error EOL
25:
                                          {syntax (); $1}
26:
                                          {[]}
27:
28: stmt
               : label action
                                          {(linenr (), Some $1, Some $2)}
                                          {(linenr (), None, Some $1)}
29:
               | action
                                          {(linenr (), Some $1, None)}
30:
               | label
31:
                                          {(linenr (), None, None)}
32:
           : IDENT COLON
33: label
                                          {$1}
34:
35: action
             : DIM IDENT LSUB expr RSUB {Absyn.Dim ($2, $4)}
36:
               | LET memref EQUAL expr
                                          {Absyn.Let ($2, $4)}
37:
               | GOTO IDENT
                                          {Absyn.Goto $2}
38:
               | IF relexpr GOTO IDENT
                                          {Absyn.If ($2, $4)}
39:
               | PRINT print_list
                                          {Absyn.Print $2}
40:
               | PRINT
                                          {Absyn.Print ([])}
41:
               | INPUT input_list
                                          {Absyn.Input $2}
42:
43: print_list : print COMMA print_list
                                          {$1::$3}
44:
               | print
                                          {[$1]}
45:
46: print
               : expr
                                          {Absyn.Printexpr $1}
               | STRING
47:
                                          {Absyn.String $1}
48:
49: input_list : memref COMMA input_list {$1::$3}
50:
               | memref
                                          {[$1]}
51:
```

```
52:
   53: memref
                  : IDENT
                                               {Absyn.Variable $1}
   54:
                  | IDENT LSUB expr RSUB
                                               {Absyn.Arrayref ($1, $3)}
   55:
                                               {Absyn.Binary ($2, $1, $3)}
   56: relexpr
                  : expr RELOP expr
                                               {Absyn.Binary ($2, $1, $3)}
   57:
                  | expr EQUAL expr
   58:
                                               {Absyn.Binary ($2, $1, $3)}
   59: expr
                  : expr ADDOP term
   60:
                  | term
                                               {$1}
   61:
   62: term
                  : term MULOP factor
                                               {Absyn.Binary ($2, $1, $3)}
   63:
                  | factor
   64:
                                               {Absyn.Binary ($2, $1, $3)}
   65: factor
                  : primary POWOP factor
   66:
                                               {$1}
                  | primary
   67:
   68: primary
                  : LPAR expr RPAR
                                               {$2}
                                               {Absyn.Unary ($1, $2)}
   69:
                  | ADDOP primary
   70:
                                               {Absyn.Number (float_of_string $1)
                  | NUMBER
}
   71:
                  | memref
                                               {Absyn.Memref $1}
   72:
                  | IDENT LPAR expr RPAR
                                               {Absyn.Unary ($1, $3)}
   73:
```

```
1: (* $Id: scanner.mll,v 1.1 2019-01-24 15:47:38-08 - - $ *)
 2:
 3: {
 4:
 5: let lexerror lexbuf =
 6:
        Etc.syntax_error (Lexing.lexeme_start_p lexbuf)
 7:
                 ["invalid character `" ^ (Lexing.lexeme lexbuf) ^ "'"]
 8:
 9: let newline lexbuf =
10:
        let incr pos =
11:
            {pos with Lexing.pos_lnum = pos.Lexing.pos_lnum + 1;
12:
                       Lexing.pos_bol = pos.Lexing.pos_cnum}
13:
        in (lexbuf.Lexing.lex_start_p <- incr lexbuf.Lexing.lex_start_p;</pre>
14:
             lexbuf.Lexing.lex_curr_p <- incr lexbuf.Lexing.lex_curr_p)</pre>
15:
16: let lexeme = Lexing.lexeme
17:
18: }
19:
                       = ['a'-'z' 'A'-'Z' ' ']
20: let letter
21: let digit
                       = ['0'-'9']
                      = (digit+ '.'? digit* | '.' digit+)
22: let fraction
23: let exponent
                       = (['E' 'e'] ['+' '-']? digit+)
24:
                       = (' #' [^{'} n']*)
25: let comment
26: let ident
                       = (letter (letter | digit)*)
27: let number = (fraction exponent?)
28: let string = '"' [^'\n' '"']* '"'
29:
```

```
30:
31: rule token
                       = parse
                     { Parser.EOF }
32:
         | eof
          | [' ' '\t'] { token lexbuf }
33:
          | comment { token lexbuf }
| "\n" { newline lexbuf; Parser.EOL }
34:
35:
          | "\n"
          | ":"
36:
                            { Parser.COLON }
          j ","
37:
                            { Parser.COMMA }
          | "("
                            { Parser.LPAR }
38:
          | ")"
                            { Parser.RPAR }
39:
                          { Parser.LSUB }
{ Parser.RSUB }
{ Parser.EQUAL (lexeme lexbuf) }
{ Parser.RELOP (lexeme lexbuf) }
{ Parser.RELOP (lexeme lexbuf) }
{ Parser.RELOP (lexeme lexbuf) }
          | "["
40:
          | "]"
41:
          | "="
42:
          | "<>"
43:
          | "<"
44:
          | "<="
45:
                           { Parser.RELOP (lexeme lexbuf) }
{ Parser.RELOP (lexeme lexbuf) }
{ Parser.ADDOP (lexeme lexbuf) }
{ Parser.ADDOP (lexeme lexbuf) }
          | ">"
46:
          | ">="
47:
          | "+"
48:
          | "-"
49:
          "*"
                            { Parser.MULOP (lexeme lexbuf) } { Parser.MULOP (lexeme lexbuf) }
50:
         ' "/"
| "%"
| "^"
51:
52:
                            { Parser.MULOP (lexeme lexbuf) }
                            { Parser.POWOP (lexeme lexbuf) }
53:
          | "dim"
                            { Parser.DIM }
54:
         | "goto"
| "if"
55:
                            { Parser.GOTO }
56:
                            { Parser.IF }
          | "input"
57:
                            { Parser.INPUT }
          | "let"
                            { Parser.LET }
58:
                           { Parser.PRINT }
          | "print"
59:
                            { Parser.NUMBER (lexeme lexbuf) }
60:
          number
          | string
                           { Parser.STRING (lexeme lexbuf) } { Parser.IDENT (lexeme lexbuf) }
61:
62:
          | ident
                           { lexerror lexbuf; token lexbuf }
63:
          I _
64:
```

```
1: # $Id: Makefile, v 1.5 2019-01-24 17:51:18-08 - - $
 2:
 3: #
 4: # General useful macros
 6:
 7: MKFILE
             = Makefile
 8: MAKEFLAGS += --no-builtin-rules
9: DEPSFILE = ${MKFILE}.deps
10: NOINCLUDE = ci clean spotless
11: NEEDINCL = ${filter ${NOINCLUDE}}, ${MAKECMDGOALS}}
12: GMAKE = ${MAKE} --no-print-directory
13:
14: #
15: # File list macros
16: #
17:
18: EXECBIN
              = sbinterp
              = etc.cmo parser.cmo scanner.cmo tables.cmo \
19: OBJCMO
20:
                 dumper.cmo interp.cmo main.cmo
21: OBJCMI
              = ${OBJCMO:.cmo=.cmi} absyn.cmi
22: OBJBIN
              = ${OBJCMO:.cmo=.o}
23: MLSOURCE
               = absyn.mli etc.mli etc.ml tables.mli tables.ml \
24:
                 dumper.mli dumper.ml interp.mli interp.ml main.ml
25: GENSOURCE = dumper.mli tables.mli parser.mli parser.ml scanner.ml
26: GENFILES = ${GENSOURCE} parser.output ${DEPSFILE}
27: OTHERFILES = ${MKFILE} ${DEPSFILE} using .ocamlinit
28: ALLSOURCES = ${MLSOURCE} parser.mly scanner.mll ${OTHERFILES}
29: LISTING
              = Listing.ps
30:
31: #
32: # General targets
33: #
34:
35: all : ${EXECBIN}
37: ${EXECBIN} : ${OBJCMO}
           ocamlc str.cma ${OBJCMO} -o ${EXECBIN}
39:
40: %.cmi : %.mli
41:
           ocamlc -c $<
42:
43: %.cmo : %.ml
44:
           ocamlc -c $<
45:
46: %.ml : %.mll
47:
           ocamllex $<
48:
49: %.mli %.ml : %.mly
50:
           ocamlyacc -v $<
51:
```

```
52:
53: tables.mli : tables.ml absyn.cmi
            @ echo "(* Created $$(date) *)" >tables.mli
            ocamlc -i tables.ml | sed 's/^type/\n&/' >>tables.mli
55:
56:
57: dumper.mli : dumper.ml absyn.cmi
58:
            @ echo "(* Created $$(date) *)" >dumper.mli
59:
            ocamlc -i dumper.ml >>dumper.mli
60:
61: #
62: # Misc targets
63: #
64:
65: clean:
            - rm ${OBJCMI} ${OBJCMO} ${OBJBIN} ${GENSOURCE}
66:
68: spotless : clean
69:
            - rm ${EXECBIN} ${GENFILES} ${LISTING} ${LISTING:.ps=.pdf}
70:
71: ci : ${ALLSOURCES}
72:
            cid + ${ALLSOURCES}
73:
74: deps : ${MLSOURCE} ${GENSOURCE}
            @ echo "# Created $$(date)" >${DEPSFILE}
76:
            ocamldep ${MLSOURCE} ${GENSOURCE} >>${DEPSFILE}
77:
78: ${DEPSFILE} : tables.mli
            @touch ${DEPSFILE}
79:
80:
            ${GMAKE} deps
81:
82: lis : ${ALLSOURCES}
83:
            mkpspdf ${LISTING} ${ALLSOURCES}
84:
85: again :
86:
            ${GMAKE} spotless
87:
            ${GMAKE} deps
88:
            ${GMAKE} ci
89:
            ${GMAKE} all
            ${GMAKE} lis
90:
91:
92: ifeq "${NEEDINCL}" ""
93: include ${DEPSFILE}
94: endif
95:
```

```
1: # Created Thu Jan 24 19:14:14 PST 2019
 2: absyn.cmi:
 3: etc.cmi :
 4: etc.cmo : etc.cmi
 5: etc.cmx : etc.cmi
 6: tables.cmi : absyn.cmi
7: tables.cmo : absyn.cmi tables.cmi
 8: tables.cmx : absyn.cmi tables.cmi
 9: dumper.cmi : absyn.cmi
10: dumper.cmo : absyn.cmi dumper.cmi
11: dumper.cmx : absyn.cmi dumper.cmi
12: interp.cmi : absyn.cmi
13: interp.cmo : tables.cmi etc.cmi dumper.cmi absyn.cmi interp.cmi
14: interp.cmx : tables.cmx etc.cmx dumper.cmx absyn.cmi interp.cmi
15: main.cmo : scanner.cmo parser.cmi interp.cmi etc.cmi
16: main.cmx : scanner.cmx parser.cmx interp.cmx etc.cmx
17: dumper.cmi : absyn.cmi
18: tables.cmi : absyn.cmi
19: parser.cmi : absyn.cmi
20: parser.cmo : etc.cmi absyn.cmi parser.cmi
21: parser.cmx : etc.cmx absyn.cmi parser.cmi
22: scanner.cmo : parser.cmi etc.cmi
23: scanner.cmx : parser.cmx etc.cmx
```

```
1: let rcs = "(* $Id: using, v 1.3 2019-01-24 17:15:07-08 - - $ *)";;
 3: print_endline rcs;;
 4:
 5: #load "str.cma";;
 6:
 7: #mod_use "absyn.mli";;
 8: #mod_use "etc.ml";;
 9:
10: #mod_use "parser.ml";;
11: #mod_use "scanner.ml";;
12:
13: #mod_use "tables.ml";;
14: #mod_use "dumper.ml";;
15:
16: #mod_use "interp.ml";;
17: #mod_use "main.ml";;
18:
19: open Interp;;
20: open Main;;
21:
22: want_dump := true;;
23:
```

```
1: let rcs = "(* $Id: .ocamlinit,v 1.6 2019-01-24 18:40:26-08 - - $ *)";;
 3: print_endline rcs;;
 4:
 5: #load "str.cma";;
 6:
 7: #mod_use "absyn.mli";;
 8: #mod_use "etc.ml";;
 9:
10: #mod_use "parser.ml";;
11: #mod_use "scanner.ml";;
12:
13: #mod_use "tables.ml";;
14: #mod_use "dumper.ml";;
15:
16: #mod_use "interp.ml";;
17: #mod_use "main.ml";;
18:
19: open Interp;;
20: open Main;;
21:
22: want_dump := true;;
23:
```