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/*****
File name:    pcc09defines.h Version 1.0
Date:        2/6/09
Class:       CS480
Assignment:  Compiler Project written in C
Purpose:     These are the manifest constants used by the various
              parts of the compiler. Do not modify any part of this
              file. I will always let you know when a new version
              is created and where you can find it.

Modifications:
*****/

#ifndef PCC09DEFINES_H
#define PCC09DEFINES_H

/*****
// symbol table entry levels
/*****
typedef enum SymbolTableLevel { RSRVWRD_LEVEL = 0,
                                GLOBAL_LEVEL,
                                LOCAL_LEVEL } SymbolTableLevel;

/*****
// symbol table entry types
/*****
typedef enum SymbolTableType { NONE = -1,
                               RSRVWRD,
                               INTEGER,
                               INTEGER_ARRAY,
                               POINTER_ARRAY,
                               POINTER,
                               FUNCNAME,
                               POINTER_TO_POINTER } SymbolTableType ;

/*****
// manifest const for reserved words
/*****
typedef enum ReservedWord { RSRVWRD_MAIN = 1,
                            RSRVWRD_INT,
                            RSRVWRD_IF,
                            RSRVWRD_ELSE,
                            RSRVWRD_RETURN,
                            RSRVWRD_FOR,
                            RSRVWRD_INPUT,
                            RSRVWRD_OUTPUT } ReservedWord;

/*****
// error codes
/*****
typedef enum ErrorCode {BAD_CHAR = 1,
                       MISSING_SEMICOLON,
                       MISSING_RPAREN,
                       MISSING_LPAREN,
                       MISSING_RBRACE,
                       MISSING_LBRACE,
                       MISSING_RBRACKET,
                       MISSING_LBRACKET,
                       IDENTIFIER_EXPECTED,
                       CONSTANT_EXPECTED,
                       MAIN_EXPECTED,
                       INVALID_DECLARATION,
                       READ_PAST_EOF,
                       BAD_EXPRESSION,
                       DUPLICATE_ID,
                       UNDECLARED_IDENTIFIER,
                       UNDECLARED_FUNCTION,

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    ID_NOT_RIGHT_TYPE,
    UNDECLARED_ARRAY,
    MISMATCHED_PARAMS,
    UNARY_TYPE_MISMATCH,
    ADDOP_TYPE_MISMATCH,
    MULOP_TYPE_MISMATCH,
    Deref_TYPE_MISMATCH,
    ASSIGN_TYPE_MISMATCH,
    INVALID_ID,
    CONST_TOO_LONG,
    BAD_STMT,
    EXTRA_TOKENS,
    NO_MORE_TOKENS,
    CANNOT_OPEN_FILE,
    OUT_OF_MEMORY,
    MISSING_COMMA } ErrorCode;

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#define ISDIGIT(c) ((c >= '0') && (c <= '9'))
#define ISLETTER(c) (((c >= 'a') && (c <= 'z')) || \
                    ((c >= 'A') && (c <= 'Z')))
#define IS_VALID_IDENT_CHAR(c) (ISDIGIT(c) || ISLETTER(c))

#define LOAD_ERRORS strcpy(gszErrors[0], "Error.");\
strcpy(gszErrors[BAD_CHAR], "Error: Character Not In Grammar.");\
strcpy(gszErrors[MISSING_SEMICOLON], "Error: Missing Semicolon.");\
strcpy(gszErrors[MISSING_RPAREN], "Error: Missing Right Parenthesis.");\
strcpy(gszErrors[MISSING_LPAREN], "Error: Missing Left Parenthesis.");\
strcpy(gszErrors[MISSING_RBACE], "Error: Missing Right Brace.");\
strcpy(gszErrors[MISSING_LBRACE], "Error: Missing Left Brace.");\
strcpy(gszErrors[MISSING_RBRACKET], "Error: Missing Right Bracket.");\
strcpy(gszErrors[MISSING_LBRACKET], "Error: Missing Left Bracket.");\
strcpy(gszErrors[IDENTIFIER_EXPECTED], "Error: Identifier Expected.");\
strcpy(gszErrors[CONSTANT_EXPECTED], "Error: Constant Expected.");\
strcpy(gszErrors[MAIN_EXPECTED], "Error: Main Declaration Expected.");\
strcpy(gszErrors[INVALID_DECLARATION], "Error: Invalid Declaration.");\
strcpy(gszErrors[READ_PAST_EOF], "Error: Read Past EOF.");\
strcpy(gszErrors[BAD_EXPRESSION], "Error: Bad Expression.");\
strcpy(gszErrors[DUPLICATE_ID], "Error: Duplicate Identifier.");\
strcpy(gszErrors[UNDECLARED_IDENTIFIER], "Error: Undeclared Identifier.");\
strcpy(gszErrors[UNDECLARED_FUNCTION], "Error: Undeclared Function.");\
strcpy(gszErrors[ID_NOT_RIGHT_TYPE], "Error: Identifier Not Right Type.");\
strcpy(gszErrors[UNDECLARED_ARRAY], "Error: Undeclared Array.");\
strcpy(gszErrors[MISMATCHED_PARAMS], "Error: Mismatched Parameters.");\
strcpy(gszErrors[UNARY_TYPE_MISMATCH], "Error: Unary Type Mismatch.");\
strcpy(gszErrors[ADDOP_TYPE_MISMATCH], "Error: Addop Type Mismatch.");\
strcpy(gszErrors[MULOP_TYPE_MISMATCH], "Error: Mulop Type Mismatch.");\
strcpy(gszErrors[DEREF_TYPE_MISMATCH], "Error: Dereference Type Mismatch.");\
strcpy(gszErrors[ASSIGN_TYPE_MISMATCH], "Error: Assign Type Mismatch.");\
strcpy(gszErrors[INVALID_ID], "Error: Invalid Identifier.");\
strcpy(gszErrors[CONST_TOO_LONG], "Error: Constant Too Long.");\
strcpy(gszErrors[BAD_STMT], "Error: Bad Statement.");\
strcpy(gszErrors[EXTRA_TOKENS], "Error: Extra Tokens.");\
strcpy(gszErrors[NO_MORE_TOKENS], "Error: No More Tokens.");\
strcpy(gszErrors[CANNOT_OPEN_FILE], "Error: Cannot Open File.");\
strcpy(gszErrors[OUT_OF_MEMORY], "Error: Out Of Memory.");\
strcpy(gszErrors[MISSING_COMMA], "Error: Missing Comma.");

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//*****
// miscellaneous constants
//*****
#define FALSE 0
#define TRUE 1
#define RVALUE 0
#define LVALUE 1
#define MAX_ERRORS 100

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#define MAX_QUADS 1500
#define MAX_RUNTIME 5000
#define ERROR_TBL_SIZE 34
#define MAX_ERROR_LINE 50
#define EXIT_NOERROR 0
#define EXIT_ERROR 1

//*****
// quad opcodes
//*****

typedef enum QuadOpcode { OP_NOP = 0,
    OP_ADD,
    OP_SUBTRACT,
    OP_MULTIPLY,
    OP_DIVIDE,
    OP_MODULUS,
    OP_MINUS,
    OP_INCREMENT,
    OP_DECREMENT,
    OP_DEREFERENCE,
    OP_BLT,
    OP_BGT,
    OP_BLE,
    OP_BGE,
    OP_BNE,
    OP_BEQ,
    OP_BAND,
    OP_BOR,
    OP_BNOT,
    OP_BRA,
    OP_PUSHPARAM,
    OP_FUNCCALL,
    OP_FUNCBEGIN,
    OP_FUNCRETURN,
    OP_INPUT,
    OP_OUTPUT,
    OP_ASSIGN,
    OP_PROGBEGIN,
    OP_PROGEND } QuadOpcode;

//*****
// quadruple address modes
//*****

typedef enum QuadAddressingMode { IMMEDIATE = 0,
    GLOBAL_LVALUE,
    GLOBAL_RVALUE,
    LOCAL_LVALUE,
    LOCAL_RVALUE } QuadAddressingMode;

//*****
// operator precedence relations
//*****
#define ERROR 0
#define YIELDS 1
#define TAKES 2
#define EQUALS 3
#define ACCEPT 4

/*****/
/* operator precedence table */
/*****/
#define NUM_CLASSES 19
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#endif