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MIDTERM TEST

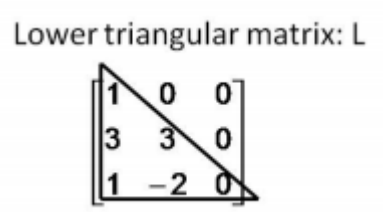
COMPILER CONSTRUCTION

(70 minutes- Open book- No Laptop)

(70 phút – được sử dụng tài liệu giấy, không được dùng các loại máy tính)

Note: The functions you are required to build are parts of project Parser used in practice exercise No 2. You must use the data structures declared in project Parser.

1/ Matrix in A lower triangular matrix is a square matrix which all entries above the main diagonal are zero. For example,



Write a KPL program to read elements in a matrix and check whether the matrix is lower triangular matrix or not. The program prints 1 if the matrix is lower triangular, otherwise it prints 0.

2/ Given the set of syntax rules:

```
22) FunDecl   ::= KW_FUNCTION TK_IDENT Params SB_COLON
    BasicType SB_SEMICOLON Block SB_SEMICOLON
23) ProcDecl  ::= KW_PROCEDURE TK_IDENT Params
    SB_SEMICOLON Block SB_SEMICOLON
24) Params    ::= SB_LPAR Param Params2 SB_RPAR
25) Params    ::= ε
```

a. Prove that productions from 24 to 25 satisfy LL(1) condition.

b. Write function `void compileParams(void)` satisfying the above syntax rules. Assuming functions `compileParams2` and `compileParam` have been built.

3/ Write function **`void readIdentKeyword (void)`** satisfying the following rules:

- Identifiers are made up of letters, digit and underscore (ASCII code 95); the first character must be a letter.
- Uppercase and lowercase letters are treated as equivalent.
- Only the first 15 characters are significant.
- Keywords are reserved: you can't use them as variable names.

Assuming function `checkKeyword` and relevant functions have been built.