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| CS 440 |
| Programming Languages and Translators |
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| MCL: Parse report |
| 03/19/2017 |

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**Variables’ Define and Initialization:**

In this parser, we define two types: integer and matrix. If you define another type to a variable, it will cause an error. You just can initial integer with an integer type and a matrix with a matrix type or an array type, otherwise you will get an error.

You can give a value to an identifier or not when you define it. We use two 1024-length arrays to store the values of integer and matrix(var\_int[] and var\_mat[]). Meanwhile, we use another special structure(ID\_) array to save the information with identifiers. The structure ID\_ has three parameters: type, identifier and index. The index is related to the index of var\_int[] and var\_mat[]. When an identifier is given a value, we will put the value into corresponding value arrays and put the identifier name and index of value arrays to the identifier structure array. Now we build a connection between identifiers and their values so that we can take out the value of an identifier easily based on its name. If you didn’t give a value to an identifier when you define it, we set a default value 0 for it. We use symbolVal and symbolVal\_M methods to insert the new identifier and its value, one for integer and one for matrix.

**Variables’ Operation and Updating Value:**

In this parser, you can do the simple four operations of integers and plus, minus and multiply of matrixes. Even you can do a multiply operation between an integer and a matrix.

For the matrix, after we process the calculation of variables’ value, we use a temporary array which has 258 length to save the pointer. Then we will copy the pointer to the var\_mat[].

When we update the two value arrays, we need to determine which is the type of the identifier and then put the value to the corresponding array. As we discussed above, we have a ID\_ structure. We can easily get the type of an identify, then it is easy to update the value arrays. We use updateSymbolVal and updateSymbolVal\_M methods to update the value of the identifier, one for integer and one for matrix.

**Print and Clean:**

We set a print method to print the result of identifier’s value and a clean method to release the used buffer of the parser.