

```
package nand2tetris;

import java.io.*;
import java.util.*;

public class SymbolTable {

    private HashMap<String, String> symbolTable;
    private int memoryCell;

    public SymbolTable() {
        symbolTable = new HashMap<String, String>();
        memoryCell = 16;
        initialize();
    }

    private void initialize() {
        symbolTable.put("R0", "0");
        symbolTable.put("R1", "1");
        symbolTable.put("R2", "2");
        symbolTable.put("R3", "3");
        symbolTable.put("R4", "4");
        symbolTable.put("R5", "5");
        symbolTable.put("R6", "6");
        symbolTable.put("R7", "7");
        symbolTable.put("R8", "8");
        symbolTable.put("R9", "9");
        symbolTable.put("R10", "10");
        symbolTable.put("R11", "11");
        symbolTable.put("R12", "12");
        symbolTable.put("R13", "13");
        symbolTable.put("R14", "14");
        symbolTable.put("R15", "15");

        symbolTable.put("SCREEN", "16384");
        symbolTable.put("KB0", "24576");

        symbolTable.put("SP", "0");
        symbolTable.put("LCL", "1");
        symbolTable.put("ARG", "2");
        symbolTable.put("THIS", "3");
        symbolTable.put("THAT", "4");
    }

    public void add(String symbol, int v) {
        Integer value = new Integer(v);
        String valueString = value.toString();

        symbolTable.put(symbol, valueString);
    }

    public int retrieveValue(String valueString) {
        if (symbolTable.containsKey(valueString)) return
            Integer.parseInt(symbolTable.get(valueString));
        add(valueString, memoryCell);
        memoryCell++;
        return memoryCell-1;
    }
}
```