

ASSIGNMENT #1

Due Tuesday, January 28, 2003

Consider the following grammar G , based on your Two-Level Grammar syntax:

```
expression      ::= identifier-string {identifier-string} | ( expression )
                  | apply-expression | get-expression
identifier-string ::= string | type-identifier
apply-expression ::= apply map-identifier to expression
get-expression   ::= class-identifier get string
```

Assume that `type-identifier`, `map-identifier` and `class-identifier` are lexically the same and that a string is distinguishable from `(` and `apply`.

1. Construct the LL(1) parsing table for G' , where G' is equivalent to G , eliminating left-recursion and left-factoring where necessary.
2. Construct the set of LR(1) items for G (the original grammar given above).
3. Merge the sets of items having common cores to give the set of LALR(1) items.
4. Construct the LALR(1) parsing table from the set of LALR(1) items.
5. Simplify the LALR parsing table using the compaction techniques discussed at the end of Section 4.7.
6. Augment the compacted LALR table with appropriate error recovery calls and routines. Give a general explanation of how your error recovery routines work.