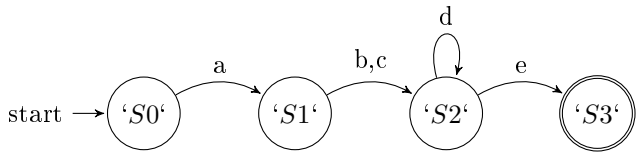
TDT4205 Compiler Technology Problem Set 2

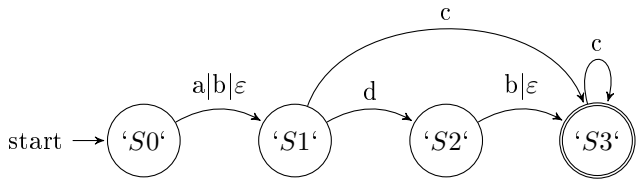
January 31, 2014

Problem 1, Regular languages

a)



b)



c) Not quite sure if this is the expected answer, but if the program encounters a while loop without brackets as such:

```
while(condition)
    singleOperation();
```

, the program will remove all code until a '{' and a matching '}' are encountered. As a result, the code snippet

```
while(condition)
    singleOperation();
int a = 0;
int b = 1;
for(int i=0; i<10; ++i){
    oneOperation();
    anotherOperation();
}
++a;
++b;
```

will be trimmed down to

```
++a;
++b;
```

.

Problem 2, Grammars

a) An ambiguous grammar is a grammar for which there exists a string that can have more than one leftmost derivation.[1]

b) The grammar is not ambiguous, as every string from the grammar can have only one leftmost derivation.

c) A left recursive grammar is a grammar whose left-most symbol in any non-terminal production either immediately or through other non-terminal definitions rewrites to the same non-terminal production.[2]

d) If i read the grammar correctly (Sp is a combination of the non-terminal S and a p), the grammar is left recursive.

References

[1] `http://en.wikipedia.org/wiki/Ambiguous_grammar`

[2] `http://en.wikipedia.org/wiki/Left_recursion`