

## FLAC HW 2 Notes

- When constructing an NFA from a DFA, show the transition table as a table. (You don't need to show unreachable states.) Also, the label of a state of the DFA should be the set of NFA states from which it was constructed. (This makes grading easier.) Also, make sure that you indicate the starting and accepting state(s).
- When proving that a language is nonregular, you generally should give a specific counterexample string. For example, if  $w^2 = xyz$ , then in general  $xz$  is not a palindrome, but it is a palindrome for  $x=10, y=1111, z=111101$ . So you can't simply assert that  $xz$  is not a palindrome; you need to provide a specific case where it clearly is not a palindrome.
- When using the Pumping Lemma, the lemma tells you certain things about  $x, y,$  and  $z$ . However, you can't directly choose the value or length of these variables beyond what the pumping lemma tells you. In particular, you can't choose  $|xy|$  to be  $p$ ; all you know is that it is less than or equal to  $p$ .
- Sometimes, when proving a language nonregular, it is best to not use the Pumping Lemma itself, but instead to use the same kinds of ideas that were used to prove the Pumping Lemma.
- For Exercise 4(c), the language  $A_{1/3,3/3}$  is not the concatenation of the languages  $A_{1/3}$  and  $A_{3/3}$ ; you can only cat a string from  $A_{1/3}$  with the the corresponding string (not any string) from  $A_{3/3}$ .
- If  $a^n c^n = xyz$  and  $|xy| \leq p$  and  $n \geq p$ , then you can conclude that  $y$  can't contain any occurrences of "c". You don't need to consider the case where  $y$  has an "a", because that case is impossible.
- Please include your andrew.cmu.edu username on your homework.
- If  $w$  is a string, then the number of occurrences of  $w$  in  $w^n$  is not necessarily  $n$ , due to potential overlapping.

### Grade distribution

105-109: 4

100-104: 3

95-99: 9

90-94: 5

85-89: 2

80-84: 1

75-79: 1

70-74: 0

0-70: 1