

# Assignment 1

L545

Due Wednesday, January 23

1. (a) For each regular expression in (i)-(iii), indicate which ones of the following strings it matches:
  - a
  - b
  - c
  - d
  - ab
  - ac
  - ad
  - bc
  - bd
  - cd
  - abc
  - abd
  - acd
  - bcd
  - abcd
  - i.  $/(a|bc?)d/$
  - ii.  $/a.*c\b/$
  - iii.  $/\b[ab]?[^\c]\b/$
- (b) For each description, write a regular expression to match it (and no other elements):
  - i. ab, bb, cb
  - ii. ab, bb, cb, anb, bnb, cnb
  - iii. ab, bb, cb, anb, bnb, cnb, abb, bbb, cbb, abnb, abbnb, abbbnb, ... [continuing this pattern]
2. For the regular expression you wrote in (1biii),
  - (a) define a deterministic finite-state automaton (DFSA), i.e., give a formal definition (cf. slides 19-22).
  - (b) draw the corresponding finite-state transition network (FSTN).
3. Do question #2.3 from Jurafsky & Martin (p. 43), regarding English money expressions.
4. Do question #2.4 from Jurafsky & Martin (p. 43), regarding English dates.
5. Do question #2.8 from Jurafsky & Martin (p. 44), regarding writing a regular expression for an NFSA.