(J) Lexicondensed (1/4) [15 points]

Compiling a lexicon (a catalog of words) can be time-consuming and difficult because each individual word has so many potential forms. Suppose that you are dealing with the following words:

view, viewed, viewing, views, review, reviewed, reviewing, reviews, watch, watched, watches, watching, rewatch, rewatches, rewatching, rewatched, wave, waved, waves, waving, rewave, rewaves, rewaved, and rewaving.

Writing all of these forms is tedious; even though you generate a list, you will probably feel listless. Therefore, instead of using this brute force method, you can condense the list with the format shown below:

```
VERBPREFIX        VERBSTEM          VERBSUFFIX
re                watch             ed
Ø                 view              s
                  wave              ing
                                    Ø
```

This setup generates a list of all words that consist of one component of VERBPREFIX followed by one component of VERBSTEM followed by one component of VERBSUFFIX (the Ø stands for an empty spot, so a word could have no letters in the VERBPREFIX or VERBSUFFIX slot). The list generated is identical to the brute force list but is much less tedious to create.

There is one major problem, however. The way that this format strings together word components (called morphemes) does not account for spelling changes that may occur along the way. For example, many legitimate words are generated, such as watch, review, and rewaves, but some misspelled words also result, such as watchs and waveing. In order to fix this, you also need to write a set of spelling change rules to describe these changes. The applicable rules in this case are:

```
ch -> che || * s
e -> Ø || * [ed | ing]
```

These rules mean "ch turns into che if ch is followed by s" and "e turns into nothing if e is followed by ed or ing."

There are many different ways that this type of rule can be written. Here are a few more examples of such rules and their meanings:

u -> w || * Vowel	(u turns into w if u is followed by a vowel)
np -> mp	(np always turns into mp)
t -> c || Consonant * kf	(t turns into c if it is between a consonant and kf)
[l | f | r] -> z || w * [c | p]	(each letter l, f, or r will turn into z if it falls between w and either c or p)

(J) Lexicondensed (2/4)

J1. Consider the following lexicon and set of rules. (Note that the rules apply in the order given).

```
PARTONE         PARTTWO         Spelling Change Rules:
cdn             rgt             vsk -> ko
cav             sks             nbj -> jirj
                                nsk -> jeej
_ _ _           _ _ _           gt -> e || avr *
                                j -> res || avb *
                                j -> tu || b *
                                gt -> ar
                                vb -> yp
                                cdj -> b
                                c -> cal || q * y
                                js -> ch
                                os -> o || ak *
                                ak -> jinkcj || c *
                                cj -> g
                                dnr -> ed
                                s -> ry || o *
                                q -> hi || * ck
                                q -> eu || * ca
                                ay -> y || * p
                                qc -> po
                                c -> m || * av
                                vr -> pl
```

A. Write the four words generated by the above lexicon and set of rules.

B. If you add two more three-letter entries to the lexicon (one entry in PARTONE and one entry in PARTTWO), the system will generate an additional five words that go together with the four words from Task 1. What are the new entries for PARTONE and PARTTWO?

What are the five newly generated words? *(Hint: Every rule is used at least once.)*

(J) Lexicondensed (3/4)

J2. The following lexicon and incomplete set of spelling change rules was designed to output a list of adjectival forms of country names, as shown in the table on the next page. It works almost exactly as intended: the output of the setup is identical to the "Desired Adjective" column (on the next page) *except* that it produces the wildly incorrect word "ottruese" in place of "australian."

TASK: Fill in the blanks in the Spelling Change Rules (just write your answers directly in the blanks in the box below). Each blank stands for a single letter. Remember that these rules will produce "ottruese" instead of "australian" and that the rules apply in the order given.

```
COUNTRY              ENDING      Spelling Change Rules
andorra              ian
australia                        _ _ -> _ _ _
bhutan
bolivia                          ian -> Ø || t *
cambodia
chad                             _ _ -> Ø
chile
china                            _ _ -> Ø|| [ _ i | e _ i ] *
congo
cuba                             _ _ _ -> _ _ _ _
cyprus
england                          i -> Ø || [ _ | _ | _ | a _ | _ ] *
fiji
guyana                           _ _ -> Ø || c *
indonesia
israel                           _ _ _ -> _ _ _ _ || _ *
japan
kenya                            _ _ _ i a n -> _ _ _
mexico
morocco                          _ _ -> _ _ _ || [ n | m ] *
nauru
netherlands                      _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ -> _ _ _ _ _
poland
portugal
rwanda
singapore
sudan
togo
uganda
vietnam
yemen
```

(J) Lexicondensed (4/4)

Country	Desired Adjective	Country	Desired Adjective
andorra	andorran	japan	japanese
australia	australian	kenya	kenyan
bhutan	bhutanese	mexico	mexican
bolivia	bolivian	morocco	moroccan
cambodia	cambodian	nauru	nauruan
chad	chadian	netherlands	dutch
chile	chilean	poland	polish
china	chinese	portugal	portuguese
congo	congolese	rwanda	rwandan
cuba	cuban	singapore	singaporean
cyprus	cypriot	sudan	sudanese
england	english	togo	togolese
fiji	fijian	uganda	ugandan
guyana	guyanese	vietnam	vietnamese
indonesia	indonesian	yemen	yemeni
israel	israeli		