

LING L-545/CSCI B-659: Computation and Linguistic analysis

Name: Manasi Swaminathan

Username: mswamina

Morphological Analysis

Modeling Morphological with Finite-State transducers using HFST

The lexical transducer could have been implemented with flags but here I have used a simple lexical transducer morphotactics with continuous classes.

```
Multichar_Symbols

%<noun%>      ! Noun
%<singular%>  ! Singular
%<plural%>    ! Plural

LEXICON Root

Noun;

LEXICON N-1

%<noun%>: P1 ;

LEXICON NS-1

%<noun%>: S1 ;

LEXICON P1

%<plural%>:%> #; !"s"

LEXICON S1

%<singular%>:%> #; !"noun_itself"

LEXICON Noun

stylo:stylos N-1 ; ! "pen, pens"
stylo:stylo NS-1 ; ! "pen, pen"
livre:livres N-1 ; ! "book, books"
livre:livre NS-1 ; ! "book, book"
cinéma:cinémas N-1 ; ! "theater, theaters"
cinéma:cinéma NS-1 ; ! "theater, theater"
professeur:professeurs N-1 ; ! "professor, professors"
professeur:professeur NS-1 ; ! "professor, professor"
chien:chiens N-1 ; ! "dog, dogs"
chien:chien NS-1 ; ! "dog: dog"
éléphant:éléphants N-1 ; ! "elephant, elephants"
éléphant:éléphant NS-1 ; ! "elephant, elephant"
animal:animaux N-1 ; ! "animal, animals"
animal:animal NS-1 ; ! "animal, animal"
cheval:chevaux N-1 ; ! "horse, horses"
cheval:cheval NS-1 ; ! "horse, horse"
```

```
journal:journaux N-1 ; ! "newspaper, newspapers"
journal:journal NS-1 ; ! "newspaper, newspaper"
château:châteaux N-1 ; ! "castle, castles"
château:château NS-1 ; ! "castle, castle"
neveu:neveux N-1 ; ! "nephew, nephews"
neveu:neveu NS-1 ; ! "nephew, nephew"
oeil:yeux N-1 ; ! "eye, eyes"
oeil:oeil NS-1 ; ! "eye, eye"
monsieur:monsieurs N-1 ; ! "man, men"
monsieur:monsieur NS-1 ; ! "man, man"
madame:madames N-1 ; ! "woman, women"
madame:madame NS-1 ; ! "woman, woman"
mademoiselle:mademoiselles N-1 ; ! "young woman, young women"
mademoiselle:mademoiselle NS-1 ; ! "young woman, young woman"
billet:billets N-1 ; ! "ticket, tickets"
billet:billet NS-1 ; ! "ticket, ticket"
hibou:hiboux N-1 ; ! "owl, owls"
hibou:hibou NS-1 ; ! "owl, owl"
joujou:joujoux N-1 ; ! "toy, toys"
joujou:joujou NS-1 ; ! "toy, toy"
carnaval:carnavaux N-1 ; ! "carnival, carnivals"
carnaval:carnaval NS-1 ; ! "carnival, carnical"
```

Compiling the .lexc file and printing out the strings.

```

→ ~ hfst-lexc frh.lexc -o frh.lexc.hfst
hfst-lexc: warning: Defaulting to OpenFst tropical type
Root...1 N-1...1 NS-1...1 P1...1 S1...1 Noun...
→ ~ hfst-fst2strings frh.lexc.hfst
stylo<noun><singular>:stylo>
stylo<noun><plural>:stylos>
oeil<noun><plural>:yeux>
livre<noun><singular>:livre>
livre<noun><plural>:livres>
oeil<noun><singular>:oeil>
carnaval<noun><singular>:carnaval>
carnaval<noun><plural>:carnavaux>
chien<noun><singular>:chien>
chien<noun><plural>:chiens>
cheval<noun><singular>:cheval>
cheval<noun><plural>:chevaux>
château<noun><singular>:château>
château<noun><plural>:châteaux>
cinéma<noun><singular>:cinéma>
cinéma<noun><plural>:cinémas>
neveu<noun><singular>:neveu>
neveu<noun><plural>:neveux>
éléphant<noun><singular>:éléphant>
éléphant<noun><plural>:éléphants>
monsieur<noun><singular>:monsieur>
monsieur<noun><plural>:messieurs>
madame<noun><singular>:madame>
madame<noun><plural>:madames>
mademoiselle<noun><singular>:mademoiselle>
mademoiselle<noun><plural>:mademoiselles>
animal<noun><singular>:animal>
animal<noun><plural>:animaux>
professeur<noun><singular>:professeur>
professeur<noun><plural>:professeurs>
hibou<noun><singular>:hibou>
hibou<noun><plural>:hiboux>
joujou<noun><singular>:joujou>
joujou<noun><plural>:joujoux>
journal<noun><singular>:journal>
journal<noun><plural>:journaux>
billet<noun><singular>:billet>
billet<noun><plural>:billets>

```

Visualize FST

