

HOMEWORK 4

LING 388

In this assignment, you will construct a parser for the fictional Cranish language using flex and bison. The phonemic inventory of Cranish consists of 2 vowels /a/, /i/, and 2 consonants /b/, /d/. Cranish has 8 nouns:

| | | | |
|-----|---------|-----|--------|
| bab | ‘man’ | dab | ‘dog’ |
| bad | ‘woman’ | dad | ‘cat’ |
| bib | ‘boy’ | dib | ‘wolf’ |
| bid | ‘girl’ | did | ‘bird’ |

Cranish has 8 total verbs, 4 transitive and 4 intransitive:

| <i>Transitive (V_t)</i> | | <i>Intransitive (V_i)</i> | |
|-----------------------------------|--------|-------------------------------------|--------|
| aba | ‘see’ | iba | ‘go’ |
| abi | ‘kill’ | ibi | ‘come’ |
| ada | ‘find’ | ida | ‘walk’ |
| adi | ‘lose’ | idi | ‘fly’ |

Cranish also has 2 truth value markers to indicate whether a sentence is true or false:

| | |
|----|-----------|
| ba | ‘yes’ |
| bi | ‘no, not’ |

Cranish allows only the following sentence structures:

| Statements | No. of possible sentences |
|-----------------|--------------------------------------|
| $N_s V_i T$ | $8 \times 4 \times 2 = 64$ |
| $N_s V_t N_o T$ | $8 \times 4 \times 8 \times 2 = 512$ |
| Questions | |
| $V_i N_s T$ | $8 \times 4 \times 2 = 64$ |
| $V_t N_s N_o T$ | $8 \times 4 \times 8 \times 2 = 512$ |
| Total | 1152 |

1. FLEX SCANNER

5 pts. Write a flex scanner that parses strings of Cranish into parts of speech. For example, if the sentence is dadabididbi ‘cat kill bird not,’ the scanner would parse this into NOUN VERB NOUN TRUTH. Your scanner does not need to print anything to the screen, but will serve as input to the bison parser described below. Refer to the English scanner we constructed in class.

Date: Due December 10, 2009.

2. BISON PARSER

5 pts. Write a bison parser that determines whether a given input from the flex scanner is a grammatical sentence of Cranish. If the input is grammatical, the parser should print 'Grammatical' to the screen, and 'Ungrammatical' if it is not. A sample session would look like this:

```
$ ./cranish
dadabibibbi
Grammatical
abibibdadba
Grammatical
abbibdadba
Ungrammatical
$
```