



1 Generating Vanity Plates

Write an Icon program to generate *vanity plates*, car license plates with cute messages. The idea is to try to shorten long words taken from a standard dictionary by replacing sequences of letters with shorter character sequences. The resulting license plate must consist of at most six letters and digits. Here are some examples:

ORIGINAL WORD	LICENSE PLATE	RULES USED
fortunate	4TUN8	for → 4, ate → 8
stench	S10CH	ten → 10
ozone	OZ1	one → 1
mezzanine	MEZZA9	nine → 9
foursquare	4SQARE	four → 4, qu → q
forklift	4KLIFT	for → 4
european	EUROPN	pea → p
detour	DE2UR	to → 2

The input of your program should be a sequence of words, one per line, read from standard input.

The output of your program should be a sequence of pairs of the form `original word --> vanity plate`, like this:

```
fortunate --> 4tun8
stench    --> s10ch
ozone     --> oz1
```

Your program should make judicious use of Icon's

- *generators* (i.e. procedures that generate multiple results using the `suspend` statement),
- built-in data structures (i.e. lists, records, sets, and tables), and
- *goal-directed evaluation* (i.e. bounded backtracking).

There are many collections of vanity plates on the internet that can give you ideas for constructing your rule base. See, for example, <http://www-chaos.umd.edu/misc>.

2 Code Template

Here is a template for the structure of your Icon program:

```
# produce all possible vanity-plates from the word
# 'str', given the possible substitutions in the table
# 'substitutions'.
procedure generate(str,substitutions)
    ....
    suspend result
    ....
end

# read all words from standard input into a list, and
# return this list
procedure readWords()
    ....
    return words
end

# build a table of possible substitutions, such as
# "one" --> "1", and return this table.
procedure buildTable()
    ...
    return tab
end

procedure main(args)
    words := readWords()
    substitutions := buildTable()
    every input := !words do
        every st := generate(input, substitutions) do
            write(input, " --> ", st)
        end
    end
end
```

3 Submission and Assessment

The deadline for this assignment is Noon, Wed Dec 1. You should submit the assignment electronically using the Unix command `turnin cs372.9 <files>`. This assignment is worth 4% of your final grade.

Name your program `vanity.icn`.

Don't show your code to anyone, don't read anyone else's code, don't discuss the details of your code with anyone. If you need help with the assignment see the instructor.