# FIT2014 Assignment 1 Problem 2 – Damien Ambegoda (30594235)

1. The upper bound is:

The justification for this is that there are two ways to get a string of n characters. Either add a single character name (274 choices) to every single possible string of size n-1 characters or add a double character (12 choices) name to every single possible string of size n-2 characters. Add them together to get all strings of n characters.

accounts for adding any of 274 character to all strings of size n-1.

accounts for adding any of 12 double character names to all strings of size n-2.

The reason why this is an upper bound and not an exact value is because some double character names are 2 single character names in a specific order. For example, 남궁 (Namgung) is the single character name 남 (Nam) plus the single character name 궁 (Gung).[[1]](#footnote-1) This would be counted twice as it would be included as both a double character name as well as two individual single character names. This means that this calculation includes too many strings and is an upper bound and not an exact value.

1. The statement that is trying to be proven is that This will be proven by induction. Fn is defined as .

Base cases:

Therefore,

Therefore,

Therefore,

Therefore, the statement is true for n = 1, 2 and 3

Inductive hypothesis:

Assume that for some value up until and including n,

Inductive Step:

It must be shown that the statement is true for n+1.

By the hypothesis, Fn must be and Fn-1 must be .

(as )

Therefore, by the principle of mathematical induction, the statement is true for all

1. Names from: <https://en.wikipedia.org/wiki/List_of_Korean_surnames> [↑](#footnote-ref-1)