Quiz 1b Rubric

1. (3 points) I claim that in functional programming, ignoring infinite loops, new-if and if will both always get the same answer. Am I right? Justify your answer.

Yes, because if has the same semantics as a normal-order version of new-if. Since we are doing functional programming, normal order and applicative order should give the same answer.

Other answer: No, because (new-if #t 4 (/ 4 0)) causes an error in applicative-order but not in normal-order. This answer is technically wrong, because errors are not functional. However, they are not supposed to know this, so they should get the full 3 points for this.

1. (3 points) Write a procedure mnemonic which takes the first letters of the words in a sentence and combines them into a word. If you need it, the empty word is “” and the empty sentence is ‘(). **We will cut points for bad style!**

> (mnemonic ‘(violet indigo blue green yellow orange red))

vibgyor

(define (mnemonic sent)

(if (empty? sent)

“”

(word (first (first sent)) (mnemonic (bf sent)))))

1 point for the base case

1 point for the recursive call

1 point for combining the recursive call with the first sentence

-0.5 points for minor errors, such as using sentence instead of word.

1. (4 points) Write a procedure planguage which takes a word and converts it to P language. To convert a word to P language, after every set of consecutive vowels, you should insert the letter p followed by the same set of consecutive vowels. If you need it, the empty word is “” and the empty sentence is ‘(). **We will cut points for bad style!**

Hint: Helper functions can come in handy for this problem.

> (planguage ‘balloon)

bapalloopoon

> (planguage ‘sequoia)

sepequoiapuoia

> (planguage ‘orangutan)

oporapanguputapan

(define (vowel? letter) (member? letter ‘aeiou))

(define (planguage wd)

(cond ((empty? wd) wd)

((vowel? (first wd))

(word (first-vowels wd) ‘p (first-vowels wd)

(planguage (bf-vowels wd))))

(else (word (first wd) (planguage (bf wd))))))

(define (first-vowels wd)

(if (or (empty? wd) (not (vowel? (first wd))))

“”

(word (first wd) (first-vowels (bf wd)))))

(define (bf-vowels wd)

(if (or (empty? wd) (not (vowel? (first wd))))

wd

(bf-vowels (bf wd))))

Grading: This is a hard question, so it should be graded leniently. It shouldn't be too hard for people to get 2-3 points of partial credit.

1 point for trying to distinguish between vowels and consonants

1 point for reasonable base cases

1 point for inserting a 'p' in a reasonable location and duplicating nearby vowels

1 point for correctness. However, this rubric is very rough.