

STAT 490
Quiz 1
Spring 2017
 January 26, 2017

1. The Li Life Insurance Company wants to develop a double decrement table to price a life insurance product. The double decrement table will have decrements of death (d) and withdrawal (w). Xin who is the Chief Actuary at Li Life asks Kathy and Drew to develop the double decrement table using the independent single decrement tables.

Xin provides the following information for the single decrement tables:

x	$q_x^{(d)}$	$q_x^{(w)}$
80	0.10	0.20
81	0.12	0.15

Xin asks Kathy to find the double decrement values for age 80 and she asks Drew to find the values for age 81. Kathy makes the assumption that each decrement is distributed uniformly in a double decrement table. Drew makes the assumption that each decrement is uniformly distributed in the respective single decrement tables.

Complete the following multiple decrement table developed by Kathy and Drew. Be sure to show your work:

x	$l_x^{(\tau)}$	$d_x^{(d)}$	$d_x^{(w)}$
80	10,000		
81			

2. Adam purchases a 10 year term insurance policy.

There are two ways that Adam's policy can terminate:

- a. Death (1) and
- b. Diagnosis of a critical illness (2).

The policy pays a death benefit of 50,000 at the moment of death. The policy will also pay a critical illness benefit of 70,000 if Adam is diagnosed with a critical illness. Only one benefit will be paid.

You are also given:

- i. $\mu_x^{(1)} = 0.015$
- ii. $\mu_x^{(2)} = 0.025$
- iii. $\delta = 0.05$

Adam pays a net premium continuously during his lifetime as long as the policy is in force. Note the policy will end at the end of 10 years even if no benefit has been paid. The net premium is determined using the equivalence principle.

Calculate the net premium paid by Adam.