Actuarial Mathematics II
MTH5125

Algorithm for the excel file used in 6.3

Spring Term

Steps

1. Find yearly death rate $_{k|}q_x$ which is equivalent to $P\left(K=k\right)$ for $k=\{0,1,2...\}$

2. Set up a table to help with the equivalence principle:

   2.1 First column - the yearly death rates calculated above $_{k|}q_x$

   2.2 Second column: discount rates: v^{k+1}

   2.3 Third column: \$1- annuity payments (certain)
   $$\ddot{a}_{\overline{K+1|}} = 1 + v^1 + v^2 + ... + v^K$$

   2.4 Fourth coulumn: \$1 - life time assurance benefit: $v^{k+1}\ _{k|}q_x$

   -the sum all values gives $\sum\limits_{k=0}^{\infty} v^{k+1}\ _{k|}q_x$ which is **the expected value of the benefit outgo.**

   2.5 Fifth column- life time annuity (take into acount the expected future lifetime): multiply first column to third column- the sum all values gives $\sum\limits_{k=0}^{\infty} \ddot{a}_{\overline{k+1|}}\ _{k|}q_x$ which is **the expected value of the income**