Question: I was curious if you could show how to do the Example discussed on page 54 (of the manual). It seems to me that you would need to sum up the 30 q's since UDD only applies from 30 to 31, from 31 to 32, etc. Or do you treat it as UDD all the way from 30 to 65?

Answer: The APV we are looking for is

$$10,000\left[\overline{A}_{\overset{1}{35}:\overline{30|}} + A_{35:\overset{\;\;1}{\overline{30|}}}\right]$$

The relation

$$\overline{A}_x = \frac{i}{\delta}A_x$$

holds if there is UDD over each single year of death (as you described). So we <u>don't</u> have to assume deaths are uniform over the entire 30-year period, just over each year of age.

As the book indicates

$$\frac{i}{\delta} = \frac{0.06}{\ln(1.06)} = 1.0297.$$

Also,

$$A_{\overset{1}{35}:\overline{30|}} = A_{35} - {}_{30}E_{35}\; A_{65}$$

$$= 0.1287 - \left(\frac{1}{1.06}\right)^{30} \cdot {}_{30}p_{35} \cdot (0.4398) = 0.0675,$$

and

$$A_{35:\overset{\;\;1}{\overline{30|}}} = {}_{30}E_{35} = 0.1392$$

The rest of this part follows as in the text.

For the variance, the approach is similar, but it is useful to note that

$${}^2\overline{A}_x = \frac{2i + i^2}{2\delta} \cdot {}^2A_x$$

This is not immediately obvious but is true since anytime we want to write and expression for ${}^2\overline{A}_x$, we have to double the force of interest in the expression for $\overline{A}_x$. This means we double δ anywhere it appears. So δ becomes 2δ and $i = e^{\delta} - 1$ becomes $e^{2\delta} - 1 = (1+i)^2 - 1 = 2i + i^2$.

That should get you going on the rest of the problem. If you still are unable to duplicate the text results, please let me know!

Robin