• **Model 1**: An animal colony is shown to have a maximum age of $\omega$, and survival function $S_0(x) = \frac{\omega-x}{\omega}$.

• **Model 2**: An animal colony is shown to have a constant force of mortality $\mu$ for all $x \geq 0$. Assume a constant force of interest $\delta$.

• **Model 3**: An animal colony is shown to have $S_0(50+k) = \frac{1}{1+i}$ for integers $k \geq 0$. Between integral ages, assume constant force of mortality holds.

• **Model 4**: An animal colony is shown to have $k/q_{50} = \frac{1}{50}$ for integers $0 \leq k \leq 49$. Assume $v = 0.99$.

• **Model 5**: An animal colony is shown to have

\[
A_x = 0.25 \\
A_{x+20} = 0.40 \\
A_{x+20} = 0.55 \\
i = 0.03.
\]  

(1)

• **Model 6**: An animal colony is shown to have

\[
A_x = 0.90 \\
A_{x+1} = 0.91 \\
p_x = 0.95.
\]  

(2)
1. For Model 1, compute for an animal in this colony the value $\bar{A}_x$.

2. For Model 2, compute for an animal in this colony the value $\bar{A}_{x.\overline{m}}$.

3. For Model 2, compute for an animal in this colony the value $\bar{A}_{x.\overline{m}}^{1}$.

4. For Model 3, compute for an animal in this colony the value $p_{50:2}$.

5. For Model 4, compute for an animal in this colony the value $A_{50:10}^{1}$.

6. For Model 5, compute for an animal in this colony the value $A_{x.\overline{m}}^{1}$.

7. For Model 6, compute $v$. 
