B07129001 王奕凱

一、(1) $f_X(x) = b(x;10,\frac{1}{10}) = \binom{10}{x}\cdot\left(\frac{1}{10}\right)^x\cdot\left(\frac{9}{10}\right)^{10-x}$

(2) $10\cdot\frac{1}{10} = 1$

(3) $\sqrt{10\cdot\frac{1}{10}\cdot\frac{9}{10}} = 0.948668$

(4) $h(y;100,10,10) = \frac{\binom{10}{y}\binom{90}{10-y}}{\binom{100}{10}}$

(5) $E[Y] = \frac{n\cdot k}{N} = 1$, $std[Y] = \sqrt{\frac{90}{99}\cdot 10\cdot\frac{10}{100}\cdot\left(1-\frac{10}{100}\right)} = 0.8182$

$1+0.8182 = 1.8182$

(6) $b(2;5,\frac{1}{10}) = \binom{2-1}{4}\cdot\left(\frac{1}{10}\right)^5\cdot\left(\frac{9}{10}\right)^{7-5}$

二、(1.) $P(W,1) = \frac{e^{-1}\cdot 1^W}{W!} = \frac{1}{e\cdot W!} = \frac{0.3679}{W!}$

(2.) $E[W] = \lambda t = 1$, $std[W] = 1$, $1+1 = 2$

(3.) $P(|W-E[W]| \le 2\ std(W)) = P(1 \le W \le 3) = 0.6131$

(4.) $P(W>120) = 1 - P(W \le 120) = 0$

(5) 机率幾乎為0，可拒絕

三、(1.) $1 - P(x<10) = 1 - \sum_{x=0}^{4} b(x;100,0.05) = 0.0318$

(2.) 僅3.18%幾率發生此狀況，因此可接受