# Recitatin 20

1

$$\Pr\{\#\text{heads} \geq \beta n\} = \Pr\{\#\text{tails} \leq (1-\beta)n\}$$

$$= \frac{1-(1-\beta)}{1-(1-\beta)/p} \cdot \frac{2^{nH(\beta)}}{\sqrt{2\pi(1-\beta)\beta n}} \cdot p^{(1-\beta)n}(1-p)^{\beta n}$$

2

(a) $\Pr\{qn \leq (p-0.04)n\}$

$$\leq \frac{1-(p-0.04)}{1-(p-0.04)/p} \cdot \frac{2^{nH(p-0.04)} \cdot p^{(p-0.04)n}}{\sqrt{2\pi(p-0.04)(1-(p-0.04))n}} \cdot (1-p)^{(1-(p-0.04))n}$$

(b) $\Pr\{qn > (p+0.04)n\} = \Pr\{qn \leq (1-(p+0.04))n\}$

$$\leq \frac{p+0.04}{1-\frac{1-(p+0.04)}{1-p}} \cdot \frac{2^{nH(p+0.04)}}{\sqrt{2\pi(p+0.04)(1-(p+0.04))n}} \cdot p^{(p+0.04)n}(1-p)^{(1-(p+0.04))n}$$

(c) sum is .054 $\rightarrow$ confidence is 0.946.

No.

3

$$\Pr\{\text{Lost} \le 0.99(10{,}000)\}$$

$$= \left(\frac{1-.98}{1-.98/.99}\right) \frac{2^{10{,}000\, H(.98)}}{\sqrt{2\pi \cdot .98(1-.98)10{,}000}} \cdot 0.01^{.98 \times 10{,}000}$$

$$\times .99^{.02 \cdot 10{,}000}$$