Q 10.
BB. Bb, bb (0th generation)
u v w (u+v+w=1)
[Hardy Weinberg principle]
v =: 2z
1st generation
BB
$u^2(1) + v^2\frac{1}{4} + w^2(0) + 2uw(0) + 2uv(\frac{1}{2}) = (u+z)^2$
bb
$(w+z)^2$

Feb 15-09:09

Bb
$u^2(0) + v^2(\frac{1}{2}) + w^2(0) + 2uw(1) + 2wv(\frac{1}{2}) + 2uv(\frac{1}{2})$
$= 2(u+z)(w+z)$

Rk. $u+v+w=1$
$(u+z+z+w)^2 = 1$
$(u+z)^2 + (w+z)^2 + 2(u+z)(w+z) = 1$
$(u+z)^2$ BB, $(w+z)^2$ bb, $2(u+z)(w+z)$ ∴ Bb

Feb 15-09:16

1st generation
BB Bb bb
$(u+z)^2$ $2(u+z)(w+z)$ $(w+z)^2$
0th generation
u 2z w
2nd generation
BB
$((u+z)^2 + (u+z)(w+z))^2 = (u+z)^2$ ∴

Feb 15-09:21

Q5 iv)
BB Bb bb
brown brown blue
brown eyed woman, parents Bb
blue eyed man (bb)
P(woman has b | child is brown eyed) = ?

	Bb	Bb
BB 1/4	Bb 1/2	bb 1/4

woman is actually brown-eyed
P(woman BB) = 1/4 / (1/4+1/2) = 1/3
P(woman Bb) = 2/3.

Feb 15-09:31

$\alpha = (u+z)^2 + (u+z)(w+z) = u+z$
$\Leftarrow u+z+w+z = 1$
$u+2z+w = 1$ ✓
BB Bb bb (0th generation)
$(u+z)[u+z+w+z] = u+z.$

Feb 15-09:25

1/3 2/3

BB	bb	Bb	bb
Bb		Bb 1/2	bb 1/2

Bayes' formula
P(mother has Bb | child brown eyed) = P(M Bb | CBE)
$= \frac{P(CBE|M\,Bb)P(M\,Bb)}{P(CBE|M\,Bb)P(M\,Bb) + P(CBE|M\,BB)P(M\,BB)}$
$= (\frac{1}{2}\times\frac{2}{3}) / (\frac{1}{2}\times\frac{2}{3} + 1\times\frac{1}{3}) = 1/2.$

Feb 15-09:38

Comments.

Q5.

- interpret the sample points of Ω
- $\{(B,L),(B,L^c),(B^c,L),(B^c,L^c)\}^{10}$

$P(B|L) = 0.05$ BAD notation!

- $\Omega = \{P(AB), P(A\overline{B}), \ldots\}^{10}$ X

BAD notation!

✓ fin. of these (two) p-ties were the same!

Feb 15-09:47

Q3

- inclusion-exclusion principle $\neq$ addition rule
- $(P(A)+P(B))^c$ X.

Q9. pairwise indep. vs. independence.

Feb 15-09:52

Q5.

sampling with replacement vs. without

"[illegible] sample grows large so the difference between the two grows small."

Feb 15-09:55