Sample solutions for exercise No. 6 Part V
Presentation on 20.04.2011 exercise session on 27.04.2011

16.3

(a) Good is true -> the 1st will get High signal -> he will choose to accept according to his own signal

\[
\Pr(A) = \Pr(A|H) \cdot \Pr(H) = \frac{3}{4} \cdot 1 = \frac{3}{4}
\]

(b)

\[
\Pr(A, A) = \Pr(A) \cdot \Pr(A) = \frac{3}{4} \times \frac{3}{4} = \frac{9}{16}
\]

\[
\Pr(A, R) = \Pr(A) \cdot \Pr(R) = \frac{3}{4} \times \frac{1}{4} = \frac{3}{16}
\]

\[
\Pr(R, A) = \Pr(R) \cdot \Pr(A) = \frac{1}{4} \times \frac{3}{4} = \frac{3}{16}
\]

\[
\Pr(R, R) = \Pr(R) \cdot \Pr(R) = \frac{1}{4} \times \frac{1}{4} = \frac{1}{16}
\]

(c)

Cascade starts when the majority (in this case the 2 decisions before the current person to decide) has made the same decision.

(I) The probability of having 2 Rejects in a sequence is:

\[
\Pr[R, R] = \frac{1}{4} \times \frac{1}{4} = \frac{1}{16}
\]

(II) And in the same condition for 2 Accepts in a sequence we have:

\[
\Pr[A, A] = \frac{3}{4} \times \frac{3}{4} = \frac{9}{16}
\]

So the probability to form a cascade is:

\[
\frac{1}{16} + \frac{9}{16} = \frac{10}{16}
\]
17.1
\[ R(x) = 1-x \quad f(z) = z \]
Reserved price = \( r(x) f(z) = (1-x)z \)
(a) cost = \( \frac{1}{4} \)
\[ r(z)f(z) = z(1-z) = \frac{1}{4} \rightarrow z = \frac{1}{2} \quad \text{Equilibrium not stable; \( z=0 \) stable equilibrium} \]
(b) cost = \( \frac{2}{9} \)
\[ r(z)f(z) = z(1-z) = \frac{2}{9} \rightarrow z = \frac{1}{3}; \frac{2}{3} \quad \text{Equilibrium; \( z=0 \) stable equilibrium} \]
(c) Because we get different equations \(-\) different solutions
(d) \( z = \frac{2}{3} \) Stable equilibrium

17.3
If we reduce the introductory price to half then it’s more likely to convince new purchasers to use our product. Even releasing some goods with a ridiculously low price or even for free can result in increasing the initial users of the product. Then we can gradually increase the price to the real reservation price and compensate the initial loss.
This method has the advantage of growing the number of users at the beginning. As a consequence other users will be easier to convince to use our product, since it has more advantages compared to the current product which users purchase it.

18.1
As normal distribution arise from many independent random decisions averaging out, power laws arise from the feedback introduced by correlated decisions across a population. If this website displays everyone about how many users have clicked on one link, which means it produces the feedback to others. We will find that under this situation, the popularity distribution will follow the power law. Moreover, the probability for the target page that people choose to link is related to the number of in-links it has. Thus, rich-get-richer appears then the webpage with large number of clicking history will be more attractive than others. So we will get also somehow power law but with different exponents. We will just change the parameters, but it's also the power law. So it's impossible to say more or less closely.