

Solutions to Homework Assignment 1

Q1.

Here are some correct answers. There are others in **Information Rules** and **The Digital Dilemma**.

- Advertising.
- Give away the first version, and subsequently sell upgrades.
- Give away a sample and make people pay for the full version. This technique is exemplified by motion-picture “coming attractions.”
- Give away only a “degraded version” of the product, *e.g.*, a poor-quality image, and make people pay for the “real version” of the product, resp. the corresponding high-quality image.
- Give away the product, and sell the service contract.
- Sell complementary products, *e.g.*, give away browser code and sell server code.
- Collect data on your customers and then sell it, use it to build partnerships, or use it to design your future products. You can collect data by, *e.g.*, forcing them to fill out a form before they can click on the link to the “free” product.

Q2.

Essentially, this is what **The Digital Dilemma** is about. Highlights include:

- (a) Journalists have more access to readers, because they do not necessarily have to be employed by established newspapers and magazines in order to reach readers; this is an advantage, particularly for would-be journalists who aren’t currently employed by established publications. On the other hand, their articles can easily be copied, modified, and redistributed, making it harder for them to receive payment and recognition. A mixed bag.
- (b) Readers have much cheaper and faster access to more articles. For the most part, this is a change for the better. The only potential downside is “information overload,” which makes it difficult for an individual to decide what he likes and to distinguish high-quality sources from low-quality sources and frauds.
- (c) Established publishers do not (yet?) have strong copyright control in the Internet world, as they do in the print world. For them, Internet distribution has thus been mostly a change for the worse so far. Some (like the National Academy Press) have figured out how to use methods such as those in Q1 above to complement their traditional distribution channels.

Other existing publishers may still figure out how to use Internet distribution profitably, and new Internet-based publishers may rise up to take the place of old ones that go out of business.

- (d) In principle, Internet advertising is a gold mine, because it can more easily be “targeted” and “personalized” than print advertising. Thus far, however, no one is really sure how successful web-based ads are, and web-site operators have recently seen revenue from ads shrink dramatically from their peaks. One can call this a mixed bag or, more accurately, an open question.

Q3.

Fundamental similarity: Under both distribution regimes, popular music is an “Information good,” as defined on pp. 3ff of **Information Rules**.

Differences: Like Q2, this is essentially what **The Digital Dilemma** is about. Highlights include:

- Reproduction costs are much lower in the MP3 world. It is vastly easier to copy MP3 files stored on an ordinary computer than it is to copy physical CDs, and each copy of an MP3 file is perfect.
- Distribution costs are much lower in the MP3 world. It is vastly easier to send MP3 files around on the Internet or post them on websites than it is to ship physical CDs around or to run a record store.

These two points imply that piracy and copyright-enforcement are much more serious problems in the MP3 world than in the CD world. On the other hand, the dramatically lower costs mean that, potentially at least, much more music can be produced and made available.

- MP3 files are much easier to modify than physical CDs. Thus, more products and “versions” can be produced and marketed; for example, singles and personalized “playlists” can be made available as well as transition albums.
- Traditional record companies may not be able to control reproduction and distribution of MP3 files, and musicians under contract with traditional record companies may not be able to collect royalties.

Q4.

- (a) IP-forwarding table for network in Figure 2.

Destination	Next Hop	Shortest Path
B	B	$A \rightarrow B$
C	B	$A \rightarrow B \rightarrow C$
D	D	$A \rightarrow D$
E	D	$A \rightarrow D \rightarrow E$

(b) IP-forwarding table for network in Figure 3.

Destination	Next Hop	Shortest Path
B	B	$A \rightarrow B$
C	B	$A \rightarrow B \rightarrow C$
D	B	$A \rightarrow B \rightarrow C \rightarrow D$
E	B	$A \rightarrow B \rightarrow C \rightarrow D \rightarrow E$

(c) A never sends any traffic over the link $A \longleftrightarrow D$, regardless of how heavy the load is on other network links. It might be better for A to do some “load balancing” by sending a limited amount of traffic, albeit at relatively high cost, over $A \longleftrightarrow D$.

Q5.

- a) Both. (You will get credit for this if you said “Internet.” These are *potential* problems in both settings, but society has developed ways of coping with them in the telephone setting.)
- b) The Internet.
- c) The telephone network.
- d) Both.