

SDS 220 - Lecture 12 Handout

OI Section 3.2

1. **Pets (Part 1).** The 12 animals shown below are currently available for adoption at a local animal shelter. Your friend has decided that they want to adopt a pet. Your friend decided to select their new pet uniformly at random from this set because all of the 12 animals below are equally adorable.



- (a) What is the probability that the pet your friend selects has a black coat?
 - (b) What is the probability that the pet your friend selects is a cat?
 - (c) What is the probability that the pet your friend selects is a black cat?
 - (d) Suppose your friend calls you up and tells you the the animal they adopted is a cat. Given this information, what is the probability that it has a black coat?
 - (e) Suppose your friend actually said that the pet they adopted has a black coat. Given this information instead, what is the probability that it is a cat?
2. **Pets (Part 2).** Now consider all the adoptable cats and dogs with black coats or white coats in the state. To consolidate information, the frequencies are given below. Suppose a pet was adopted today at random. Find the associated probabilities.

Species\Coat	Black	White	Total
Dog	.45	.06	.51
Cat	.38	.11	.49
Total	.83	.17	1

- (a) What is the probability that the pet selected has a black coat?
- (b) What is the probability that the pet selected is a cat?
- (c) What is the probability that the pet selected is a black cat?
- (d) Suppose you learn that the the animal adopted is a cat. Given this information, what is the probability that it has a black coat?
- (e) Suppose you learn that the pet they adopted has a black coat. Given this information instead, what is the probability that it is a cat?