Case Study 1

Thinking Through Classification

Due: XXX

**Problem 1 (50 points):**

**Part 1 (45 points)** In the United States and in many countries around the world, courtrooms are using algorithms to determine whether or not a criminal will be likely to commit a crime again. For this problem, we are going to dive into the value judgements that the designers and coders of these algorithms might have to make.

Write a function that determines whether someone will recommit a crime based on patterns of past data and information we know about the person in question. Your function will take in the following information about the criminal in question:

**age:** Integer

**occupation:** String

**previousCrimes:** Integer

**familyCrimes:** Integer

Your algorithm will determine if someone will recommit a crime based on the following criteria:

1. If the age is divisible by 3, they will recommit a crime.
   1. Your team looked through the past 20 years of police records and found that the majority of people who recommit crimes have an age that is divisible by 3.
2. If the occupation is “unemployed”, they will re-commit a crime.
   1. While looking through the police records, your team also discovered that most people who commit crimes are unemployed, so they assumed that anyone who is unemployed would be more likely to recommit a crime.
3. If the # of previous crimes is > 1, they will re-commit a crime.
4. If the # of FamilyCrimes is > 3, they will re-commit a crime.
5. Otherwise, they will not recommit a crime.

Your function should **print** a String. If the algorithm determines that the person will re-commit a crime, your function should print “This person will re-commit a crime”. Otherwise, your function should print “This person will not re-commit a crime”. Use the following function header:

**def recommitCrimeOrNot(age, occupation, previousCrimes, familyCrimes):**

**Part 2 (5 points)** Think about what kind of harm an algorithm like this could cause! When do you think this algorithm might guess correctly? When do you think it might get it wrong? What kinds of harms could happen in either case? Can you think of systematic ways that this algorithm could be right or wrong? Write your response to these prompts as a free response of at least 200 words. Be prepared to discuss your analysis in class.

**Problem 2 (50 points):**

**Part 1 (45 points)** For many years (even before the rise of computers) misinformation and disinformation have caused chaos in society. Now with the internet and social media, fake news is more prevalent than ever and can be disseminated by many people and organizations at an incredibly fast rate. Companies like Facebook, Twitter, and Google have attempted to make algorithms that can detect if a news article is fake or real; but no one has found a perfect solution.

As a software engineer at Facebook, you noticed a few weeks ago that [the platform was accidentally flagging real, important information about COVID-19 as fake news](https://www.theverge.com/2020/3/17/21184445/facebook-marking-coronavirus-posts-spam-misinformation-covid-19)! You have been tasked with fixing their algorithm that detects fake news to solve this issue.

Write a function that will loop through a list of headlines from the news to determine if the article is fake news or not. Your algorithm will determine if an article is fake news based on the following criteria:

If the headline includes “Fake”, “Shocking”, “Revealed”, or “Unprecedented”, it is labeled as fake news. Otherwise, the headline is labeled as real news.

Your function should **return** an Integer that represents how many articles in the list were labeled as fake news. For example, if the list contained the following headlines:

**listOfHeadlines** = [“You Won’t Believe These 10 Secrets About The President!”, “Coronavirus Update From The CDC”, “A **Shocking** Announcement From The Kardashians Has Us Screaming!”, “Facebook Fighting **Fake** News”, “New Footage From The SpaceX Launch”, “New COVID-19 Vaccine **Revealed**”]

Your function would return: 3

Use the following function header:

**def numberOfFakeNews(listOfHeadlines):**

Where listOfHeadlines is a list of Strings as shown in the example above.

**Part 2 (5 points)** Think about what kind of harm an algorithm like this could cause! When might this algorithm work? When might it produce results that are problematic? What are some of the ways that this algorithm could be harmful for members of the Facebook community? Feel free to refer to the linked article in this problem’s introduction. Write your response to these prompts as a free response of at least 200 words. Be prepared to discuss your analysis in class.