CSC 106, Summer, Homework #4
Due Wednesday, August 3rd at 11:55pm
25 marks total, worth 6% of your final grade

Disclaimer: Some of the texts you need to read for this assignment may contain strong and potentially offending language.
The texts were chosen to encourage you to think about interesting concepts and issues related to the topics of this class.

Marking:
"Briefly explain" means clearly and concisely explain the general idea of a concept.
I expect answers length varying between 1 and 5 sentences max.

A lot of questions ask for your opinion. You will not be marked on the opinion you state, but on whether or not you seem to have put some thoughts into it. Again, it is not about giving a lengthy explanation or answer, but enough to show you read the article, and had a reflection.

Question 1: Open Source and Dependencies [5 marks]

Read the following article:
http://qz.com/646467/how-one-programmer-broke-the-internet-by-deleting-a-tiny-piece-of-code/

a) Briefly explain what is open-source software.

b) Briefly explain what is the "hacker ethic".

c) Briefly explain what is GitHub.

d) In what language is written left-pad, and what does it do?

e) Briefly explain what are dependencies.

Question 2: Big Brother is Definitely Watching You [5 marks]

Read the following article:
http://www.huffingtonpost.com/2013/06/06/nsa-prism-data-mining_n_3399310.html

a) Who was behind the leak of the classified documents? (Who brought the PRISM program to our attention)?

b) In your opinion, should this person be regarded as a hero, or a traitor? Explain.

c) In class, we talked about some data mining technics. We can imagine that there are no individuals paid to listen to our conversations, read our posts on social media or look at the pictures we stored on the cloud, but that our data is being recorded and monitored by some data mining algorithms. These algorithms could be used for the greater good, or maliciously. For example, I talked in class about how allowing my credit card company to mine my shopping habits and location on every transaction have led them to identify theft after only one unusual transaction.

Describe two ways data mining citizen's personal data, as a government, could be seen as serving the greater good; and two ways that could be seen as malicious.

d) Were you aware of the fact that governments around the globe are actively 'spying' on citizens? Is being aware of this fact likely to change your behavior when using the Internet? Why or why not?

Question 3: ... So are his cousins [5 marks]

Read the following article:
http://www.wired.com/2012/10/mastercard-data-mining-holidays/

a) Targeted advertisement, costumer service, and content has some interesting benefits. Give a few examples of these benefits; both from a point of view of a company, and a customer (at least one for each).

b) Briefly explain what is the "Do Not Track" movement.

c) According to this tool, how much is your data worth?
http://www.ft.com/cms/s/2/927ca86e-d29b-11e2-88ed-00144feab7de.html#axzz4Dr2IJwMn

Question 4: ... and the pirates [5 marks]

Now that you are aware of governments and companies' 'curiosity', have a look at this:
http://www.informationisbeautiful.net/visualizations/worlds-biggest-data-breaches-hacks/

a) Roughly how many of these companies have some of your data (you have use your credit card or you are part of the reward program of the companies, or you have an account with them)?

b) Read the following blog:
http://www.stilldrinking.org/programming-sucks

How is this rant connected to the previous question? In your opinion, are data breaches a technical or an ethical problem (or both)?

c) Read the following synopsis:
http://www.cbsnews.com/news/car-hacked-on-60-minutes/

The government of British Colombia has been moving forward with centralized databases and smart devices for some of its services to its citizen. Give a couple of example of these 'smart' technologies being implemented, and their related potential dangers.

Question 5: Artificial Intelligence [5 marks]

Read the following article:
http://www.fastcodesign.com/3055867/ais-biggest-danger-is-so-subtle-you-might-not-even-notice-it

a) According to the author, what is the biggest threat associated with AI?

b) Self-driving cars are already in the streets. They typically rely on multiple types of sensors feeding the decision-making algorithms (is there an obstacle, how should I avoid it, does the current weather requires special considerations etc.).
Now that you understand better what is an algorithm, you know that programmers are the ones making decisions (so far). So here is an algorithm design question for you:

Given that the car sensors' information leads to the conclusion that there is only two possible ways to deal with an obstacle (1) the car will have to veer onto a by-stander who has a chance of survival of 0% (2) the car should hit the obstacle to save the by-stander's life, giving its passager 0% chance of survival. For such situations, should self-driving car be programmed to: Save its passengers or save the by-standers? why?

c) Would you be okay to live in a city full of self-driving cars programed to protect their passengers over you?

d) Would you buy a car that is programmed to save by-standers' life over yours?

e) Should the decision on how to handle these be made by the car manufacturers? Programmers? Governments? Ethicists? Using surveys?...

Read the following article:
http://www.huffingtonpost.com/james-barrat/hawking-gates-artificial-intelligence_b_7008706.html

f) According to the mathematician I.J. Good, Stephen Hawking, Stuart Russell, Elon Musk, Bill Gates and Steve Wozniak, what is the biggest threat associated with AI?

END OF HOMEWORK.

Liked reading these articles and would like to read more? Here are some other interesting articles and movies related to topics we covered this semester:

ARTICLES:

Programming languages:
http://qz.com/726338/the-code-that-took-america-to-the-moon-was-just-published-to-github-and-its-like-a-1960s-time-capsule/

AI and Data Mining:
http://www.economist.com/news/briefing/21650526-artificial-intelligence-scares-peopleexcessively-so-rise-machines *** Neural Networks and Deep Learning

http://www.wired.com/2015/09/voice-interface-ios/ *** also related to HCI

http://www.wired.com/2016/04/openai-elon-musk-sam-altman-plan-to-set-artificial-intelligence-free/ *** AI and Open Source movement

https://research.googleblog.com/2015/06/inceptionism-going-deeper-into-neural.html

https://github.com/google/deepdream/blob/master/dream.ipynb ** code from previous article (visualization tool on a neural network)

https://www.wired.com/2015/07/hackers-remotely-kill-jeep-highway/

http://www.nytimes.com/2012/02/19/magazine/shopping-habits.html?pagewanted=all

Graph Algorithms and Complexity:
http://www.wired.com/2015/12/landmark-algorithm-breaks-30-year-impasse/

MOVIES and TV SHOWS:

Ex Machina (2015): http://www.imdb.com/title/tt0470752/

Her (2013): http://www.imdb.com/title/tt1798709/

2001, Space Odyssey (1968) : http://www.imdb.com/title/tt0062622/

Silicon Valley TV-Show (2014-):
http://www.imdb.com/video/imdb/vi2295507737?ref_=ttvi_vi_imdb_2

Mr. Robot TV-Show (2015-):
http://www.imdb.com/video/screenplay/vi3489509913?ref_=ttvi_vi_imdb_7