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CS478 Brother Christophe
Homework: Thought Questions

1.

For each of the following applications, decide whether ML/DM would offer a viable solution and briefly justify your decision:
- **Predicting whether a particular chemical compound is carcinogenic (i.e., will induce cancer) or not.**
    - I don't believe that ML/DM could show that a compound is carcinogenic but I do think that it could give probable cause if it might be. This is because one could use ML/DM to show if individuals diagnosed over the years with cancer had, or could have had, exposure to a particular compound. This would be possible if some chain of data could be constructed to link the data surrounding the compound with corresponding medical data. This link seems reasonable due to the massive databases existing in both the medical field and the consumer field. For example, major companies tracking shopper purchases and demographics of their shoppers, and health records details health conditions and medications prescribed. Therefore, it sounds reasonable to link compounds a demographic or individual is exposed to and wither or not they have been diagnosed with cancer.

        Also, Critical Outcome Technologies uses ML/DM to help predict the effect of compounds on HIV1. It stands to reason that a similar model could be used to direct the prediction against human cells instead. If this could be done, it would be reasonable to determine if the compound would cause the cell to become cancerous.
- **Determining which African-American applicants should be extended a home loan.**
    - ML/DM could be used to help determine which African-Americans are good candidates for a home loan. Keystone Financial performed a similar task with their ML/DM tools. They used their tool to look for good prospects for their home equity loans. Using similar strategies it sounds reasonable that one could modify a similar algorithm to determine if any individual would be a good candidate for an extended home loan or tweak it for a specific ethnicity.
- **Discovering what grocery items Walmart customers tend to buy together.**
    - Most defiantly. Safeway UK used ML/DM to discover their high spending customers liked a particular kind of cheese. If Safeway UK can pull information like spending habits and items, it would be just as simple to determine which items are bought together. **However**, there doesn't really seem to be much learning for mining required for this solution, because the data is just there on checkout.
- **Grouping Wells Fargo customers by socio-demographic attributes and banking habits.**
    - Banco Espirito Snato used a similar strategy to help identify customers who might leave. ML/DM therefore would provide a great solution to help group Wells Fargo customers by socio-demographic attributes and banking habits.

- **Predicting tomorrow's value of Microsoft's stock.**
  - NASDAQ has employed several algorithms to look for clues that signal illegal activity. Therefore, it wouldn't be hard to review data over the year to build a set of clues to indicate wither or not a particular companies stock will increase or decrease. This would allow for guess as to what a given companies stock might be tomorrow. Therefore, it sounds like DM/ML would be a good solution for predicting the value of Microsoft's stock with a reasonable amount of uncertainty.
- **Predicting whether a Netflix subscriber will rent a particular new release.**
  - Most defiantly. Data could be gathered on how users view new releases. A user could then be profiled and categorized this would allow Netflix to predict wither or not a particular user will rent a given new release.
- **Sorting a list of number in ascending order.**
  - Not really. A good old fashion algorithm will do, no mining or learning required.
- **Identifying terrorists.**
  - DM/ML is a great solution for the problem. The FBI has already employed DM/ML solution in order to help predict and stop future terrorists. DM/ML is a great option to help find and later identify patterns that signal a potential terrorist.
2. **Briefly outline a possible application of ML/DM to some aspect of your life. This need not have to do with you directly; you may think of companies you/your friends/your relatives work for, schools you've attended, businesses you come in contact with regularly, etc.**
   - I work for a BI company in American Fork. They're main product is a BI reporting tool. At my company we rely on an extensive sales team to sell our product. Our sales team spends a huge amount of time explaining and demonstrating our product to prospective customers. However, during these demonstrations there are more features and gadgets that there is time to show. Therefore, if our company where to employ a ML/DM algorithm in order to one, classify a current potential client and two, build a list of the most likely desired features for a particularly classified client, our marketing team would be able to capture and more effetely sell to potential clients.