Question 1

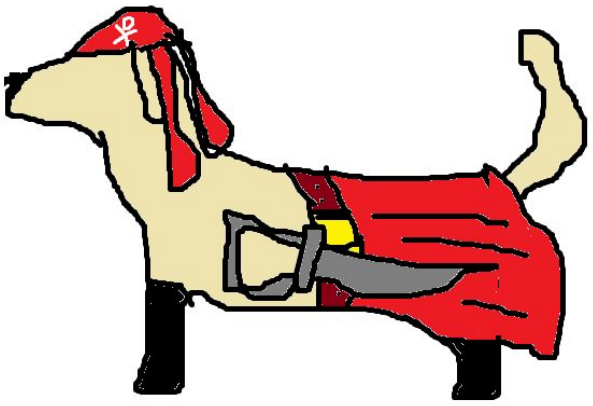
Solution: I pick LieDetectBot as the research object. In my opinion, a LieDetectBot is supposed to be able to receive a piece of sentence or words from a speaker and later make a decision whether one is telling a lie or not. Specifically, this bot would need to process natural language (maybe not only English), extract semantic information in form of logical proposition from a given sentence and analyze it by finding out if the logic proposition among all semantic entities makes sense or not, using a knowledge base. Besides, it can also be capable of capturing one's eyesight, partly because as a speaker tells a lie, his/her usually tries not to see the eyes of the other speaker but somewhere else. Therefore, such information can be utilized as well to make the final decision.

In order to build and implement such a bot, there are several issues that should be kept in mind.

1. Voice recognition: the bot must be able to receive a series of sound from a speaker and transfer it into corresponding sentences for further processing.
2. Natural language processing: a series of sentences, very much likely unordered, should be processed real time and semantic information should be extracted. Also, it should takes into account of internationality problem: multiple language types for various users.
3. Eyesight catching: this requires the bot to capture a speaker's eyesight dynamically, which means it should be able to keep track of the movement of eyesight and check out how frequently the eyesight is directed to the other speaker.
4. Semantic logic extraction: after obtaining all semantic information, perhaps in form of semantic entities, the bot should be able to analyze these entities by extracting the logic behind the expressions, in form of knowledge.
5. Knowledge base maintenance: as a critical part in the bot, knowledge base should be maintained all the time so that accurate knowledge is guaranteed for each query. Specifically, it must be able to extract some words previously said by the speaker and make it as a knowledge. For example, if the speaker once said that his dog is ill but later then he said that his dog has been healthy all the time, this can be recognized as a lie because the context is not consistent.
6. Causal inferences: Based on knowledge or context the bot obtained before, together with the speaker's current conversation plus eyesight tracking records, we can put them together and make some conclusions using causality among all these proofs. The final output for this issue is a probability which indicates how possible the speaker tells a lie.

Bonus part

1. Solution: I think she wore some clothes which makes she looks like a female pirate :)
2. One possible image of her Halloween dress (I have no pad and simply draw it using a laptop without touch screens, maybe some details cannot be revealed well):



Happy Halloween!