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CSE485
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In today's world, everyone is deeply effected by computers. Everything from banks to factories to homes run on and are touched by computers either directly or indirectly. And between those computers, there are massive networks carrying commands, messages, and information constantly across the world. This data is often meaningless and unimportant. But sometimes, it's absolutely crucial that the only people that can read it are the intended recipients. We achieve this through encryption, and this is a topic that is constantly under attack by politicians who, at the very best, are well-meaning but uneducated. The vast majority of politicians in America have absolutely no idea what encryption is, how it works, or why it is important, and this could potentially lead to a critical failure in legislation related to computer security.

Put simply, encryption is the process by which unsecured documents are made secure. To different degrees this applies to everything from personal messages to bank numbers to issues of national security. No matter what level of encryption used, however, one thing remains constant. The underlying math involved is airtight. Code can be buggy, physical security can fail. Math never will.

This puts some politician's stance that "'Maybe the back door isn't the right door, and I understand what Apple and others are saying about that,' Clinton said. 'I just think there's got to be a way, and I would hope that our tech companies would work with government to figure that out'" troubling. (Sottek, TheVerge.com) What Clinton is asking for, a way to *securely* break encryption, is not possible. If an encryption algorithm is not mathematically secure, it can absolutely never be secure no matter how perfect the code and the physical security.

It is of course important to note that Clinton is far from the only politician to hold counter-factual views of encryption. This ignorance is truly bipartisan, extending even beyond politicians to organizations that absolutely should know better, such as the FBI. Earlier this year, the FBI demanded Apple develop a tool to break the security for the iPhone 5c. (Selyukh, npr.org) Now, it's worth noting that this was not a request to break the *encryption* for the phone. The encryption was rock-solid. But it does speak to the general attitude of the government towards security in general.

This puts developers and security experts in a tough place. On one hand, nobody wants to be the guy that defies the government and refuses their requests. On the other hand, what they're requesting is contrary to everything the information security community believes. The government is asking them to make an insecure encryption system. This is, to put it bluntly, pointless. If you release an encryption with a known vulnerability, you might as well just perform a ROT13 on everything and call it good enough, because at least then you're not deceiving your users into thinking they're safe.

Politicians need to be informed by security experts as to what is and is not possible with respect to encryption, and they need it drilled into their heads that if they ban actual security they will get burned. If anything good comes from the recent DNC hacks, it will be the realization that proper encryption and security are extremely important, and the hope is that they decide it's extremely important for *everybody* and not just themselves.

The first issue I chose is a critical issue of national security and personal security to anyone that owns a computer. However, my second issue has far-reaching consequence to everyone, everywhere, forever. Jobs are disappearing. Or, rather, jobs are disappearing for humans. Automation is quickly taking up low-skilled blue and white collar jobs, and it won't be long until we can't ignore it any more.

This process can already be seen in action in factories, where any job that involves repetitive, rout tasks has been taken over by robots. According to the Harvard Business Review, "Pessimists predict huge levels of unemployment, as nearly half of existing jobs appear prone to automation and, therefore, extinction." (Jesuthasan, hbr.org) If pessimists are correct, and I personally believe they are, we're in trouble. If half of existing jobs disappear, we're going to need an entirely new system of economy to work with. Capitalism only works when consumers actually have money to consume.

Some economists, such as Arvind Subramanian, believe basic income is a possible solution. According to Time of India, he had this to say on the matter: "People are dragged into poverty due to droughts, declining agriculture opportunities, disease, and so on. So the safety net provided by the government should be quite wide, and that is why this [Universal Basic Income] has some merit." (Ahmedabad,

timesofindia.indiatimes.com) However, this is just a stop-gap. No government could possibly provide every citizen enough income to live anything more than an extremely basic life just over the poverty line. Basic income should be just that, a safety net.

As to possible leadership actions, I don't know. This is an unbelievably complex issue where every side has both merit and valid counter-arguments. It involves deep understanding of economics, politics, computer science, business, and sociology to even begin to get a grasp on the problem as a whole. The only thing that can be said for necessary first steps is we need to get everyone to acknowledge that this is in fact a real issue, and we need to get everyone to sit down in a really big room and discuss possible solutions. Beyond that, I do not know.

Issues such as these have a wide reaching and massive impact on everyone, both in America and around the world. They require nuance and care in addressing, and getting them wrong could be disastrous. But even worse that making a mistake would be not taking any action at all. That is the only truly non-viable path, because taking an action, even a poorly considered one, brings to light the issue. And that's the hardest step for anyone to take. Once that's done, we have a chance at finding an actual solution. And we absolutely need that, or we are in trouble.