



United International University

Department of Computer Science and Engineering

SOC 2101: Soc., Tech. and Engg. Ethics Final Exam. : Fall 2021
Total Marks: 25 Time: 1 hour 30 minutes + 15 minutes upload time

Any examinee found adopting unfair means will be expelled from the trimester / program as per UIU disciplinary rules.

Answer all the 5 questions. Numbers to the right of the questions denote their marks.

1. List the violated ACM codes of ethics with only one line of reason from the given scenario in Question 1.

Karim recently started his first job in a reputed software company named "Legacy." The owner of Legacy highlighted Karim's strong points and scope of contributions wherever possible to the existing team. The team was impressed by Karim's work; however, some of them did not like the creative ideas and problem-solving abilities Karim brought to the team, some neglected his ideas because of his lesser job experience too. Despite the team's repeated successes, the team's leader Shafin would erupt with verbal and personal attacks for even minor mistakes of the team members, especially the inexperienced ones. He would often criticize Karim for even a small matter. Karim discussed this matter with another team member named Nabil. Nabil agreed that the experience was unpleasant, but that was the price to pay for working in an intense, industry-leading team. Nabil's advice to Karim was to "Accept it and move on." Being irritated by his team leader's behavior, Karim intentionally wrote a program with many bugs in it. He uploaded the code to the central server, making the system vulnerable to numerous cyber attacks that can cause harm to its clients. [5]

2. COVID-19 has changed the way of using technology. During the pandemic, we have seen everything become more online-based. There has been a considerable change, especially in the field of education. Due to the epidemic, the government declared all educational institutions closed. According to the official announcement, all schools, colleges, and universities started to be held online at that time. Nowadays, students attend classes online. Moreover, the students submit their assignments and take part in examinations via the online portal. In this case, rural students are more vulnerable than urban students due to the lack of proper computer technology and infrastructure. We also know that using computer technology in the educational sector has its own pros and cons. Now, what are the major impacts you think it has over the society? [5]

3. In Bangladesh young researcher community (BYRC) award giving ceremony, a researcher, Dr. Raisul, finds that Dr. Hossain is invited to chair a session on cyber crime context in developing countries like Bangladesh. Dr. Hossain has recently started to write a book on cyber security. Before completion of the book, he was offered to be chair of the session due to his expertise in the field. Mr. Raisul posts on his Facebook- "I saw that BYRC offered Mr. Hossain to be a session chair on cyber crime context in Bangladesh. All know that he accepted the offer to boost the impression of his new book. BYRC should feel guilty to endorse a person to increase his book sales!"

What is your standpoint regarding the above situation- please explain your own word in terms of ethical context. [5]

4. COVID-19 is wreaking havoc around the world for the last couple of years. According to WHO, there have been around 350 million cases, including 5.6 million deaths worldwide. Rizwan became very distressed observing the pandemic. So, he started building an app that can predict if a user is infected or not. But how can he predict? Well, this is the era of machine learning, right? So, he built a machine learning model. But, he needs data to train the model which he got from the hospitals, taking no consent from the patients. Rizwan trained the model with this data and deployed the app publicly.

So, now the app takes different COVID-19 related symptoms from the user as input and predicts if he/she is infected or not. Initially, the accuracy was very low. To solve the issue, he started taking other things e.g., occupation, address, financial status, gender, etc., from the user as input and trained the model with this newly added data. Note that he did not inform the user how this data is going to be used.

At first, he got excited observing a better accuracy. But after a few weeks, he found the model predicts a positive infection always if the user is rich and lives in an urban area. This bias is introduced because most of the users are from the urban area and rich. But Rizwan actually built this app to help the poor in rural areas. Because there is a lack of testing facilities in the rural area.

- (a) Do you think the data collection process was ethical? If yes, explain. Otherwise, mention how is this unethical and what could have been done instead?
- (b) What type of bias is introduced here? Is this bias very harmful? What can he do to get rid of this bias?

[5]

5. If there's one cryptocurrency you should know about, it's Bitcoin. Bitcoin has been a trendsetter. Ethereum (ETH), Litecoin (LTC), Cardano (ADA), Polkadot (DOT), Stellar (XLM), Dogecoin (DOGE), Binance Coin (BNB) and many more digital coins are following the trend. So, digital coin mining became very popular. Sadly, due to the complex calculations required to mine it, the electrical power required for these operations is extremely high. As direct by-product of this operation, a tremendous amount of heat is generated which on its turn, requires cooling using air conditioner or other similar devices that also consume electrical power, generating additional heat as a by-product.

According to digiconomist.net, annual estimated electricity consumption for coin mining was around 66 Terawatt-hour/year which represents around 0.3 percent of the world energy consumption making it a significant share when compared with the actual value that it holds for our daily needs. Electricity may seem like a clean source of energy, but many countries burn fossil fuels to generate it, which adds to the carbon in the atmosphere and worsens climate change.

According to sciencedirect.com on average Bitcoin generates 272 g of e-waste per transaction processed on the blockchain. Bitcoin could produce up to 64.4 metric kilotons of e-waste at peak Bitcoin price levels seen in early 2021.

What measures the tech companies should adopt to save our nature? What measures we can take to prevent such e-waste growth? Explain how this will offer us both environmental and economic benefits. [5]