Assignment 4 – Software evolution and security

Part 1: Software Evolution:

1. **Mention one reason why software change is unavoidable.**
   One reason why software change is unavoidable is that the system may have new requirements emerge when used.

2.
   a. **Specify what categories of system maintenance are described above.**
      Situation 1: The category of system maintenance that is described is functionality addition and modification because the system will be modified to accept other payment types, such as bitcoin.

      Situation 2: The category of system maintenance that is described above is fault repairs. This is because the requirement description specifies a bug, where "the system incorrectly charges the amount paid in cash from the card instead of the balance and completes the transaction", that needs to be fixed.

   b. **Assume that you are performing an impact analysis of the changes. Identify a consequence that could occur due to each of changes requested above.**
      Situation 1: as the country's currency (Australian dollar) and e-currency (bitcoin) have different fluctuating exchange rates the store is at risk of selling goods at a loss if the e-currency rate drops.

      Situation 2: If this issue is not correctly resolved a similar problem may occur when new payment methods are added. For example, a split payment with bitcoin and cash may result in the system incorrectly charging the amount paid in cash from the bitcoin transfer instead of the balance.

Part 2: Software security:

1. **List down three assets you identify in an in-store automated supermarket shopping system when conducting the preliminary risk assessment.**
   The checkout system: The check payment system refers to the system which itemises all the products being bought by scanning barcodes and weighing produce to determine the final cost. If this system crashes, customers and employees will not be able to complete the transaction.

   The payment system: The payment system refers to the system in which customers purchase their goods, for example, card, cash, bitcoin. If this system is compromised, customer payment information may be stolen, or customers may be incorrectly charged for their goods.

   The product system: The product system refers to the system in which tracks the products within the store. If this system is not working the stock may be incorrect causing low stock products to not get ordered.

2. **Identify two possible security risk and propose a system requirement that might reduce each of those risks.**
   Risk 1: Payment information could be stolen if the system is compromised
   Requirement 1: The system should encrypt all payment information in order to prevent private information from being stolen.

Risk 2: Unauthorised user gains access to the system as a manager and makes it unavailable
Requirement 2: The system shall only permit manger access from specific set locations; this will prevent unauthorised users from being granted access to the system

Part 3: Learning Experience:

1. **Explain briefly what you learnt in this tutorial.**
   Using what I learnt about Software Evolution and Software security in the lectures, tutorials, and workshops I was able to answer the assignment questions regarding system maintenance, impact analysis, asset and security risk.

2. **List the specific learning resources, techniques, tactics, strategies that you used to learn in this tutorial.**
   The source I consulted the most was the lecture slides, from Lecture 15 - Security Engineering and Lecture 16 - Software Evolution and Security Engineering Review, provided on my uni. By using these slides, I was able to find information about software maintenance, assets, risk assessment and security risks. Another source that I consulted was my answers from the last tutorial (tutorial 4).

3. **Evaluate and reflect on your own learning ability/performance/achievement in this tutorial. What challenges did you face in learning about and completing the software evolution and security tasks in this tutorial? How will you improve for next tutorial?**
   The only challenge I faced when completing this assignment was defining three assets in an in-store automated supermarket shopping system (Part 2, question a). This was because I wasn't confident in my understanding of assets. However, after consulting the lectures for information about assets I was able to answer this question. To improve for the next assignment, I will reread the lecture slides before beginning the questions.