COIT 20246 ASSIGNMENT SUBMISSION

|  |  |
| --- | --- |
| Due date: | Thursday Week 11 (2PM AEST) |
| Part: | Written Assessment |
| Weighting: | 30% of total assessment. |
| Submission: | Electronic (see course website for details) |

**Instructions**

It will be necessary to use literature/online resources to complete this assignment, please ensure you cite and reference any such materials using the Harvard format.

**DO NOT** copy content directly from either the text or Internet resources: this assignment is to be in your own words. **You will lose marks if you do not use your own words!**

Please complete your assignment using **this** submission template file, inserting your responses where indicated.

**DO NOT delete the marking criteria page** – changes are permitted to the formatting of other pages including the headers and footers.

|  |  |
| --- | --- |
| **Please fill in the following details:** | |
| **Student Name** |  |
| **Student Number** |  |

|  |
| --- |
| **Week 1** |
| The text discusses the elements of modern computing architecture however is largely silent on the individuals who played a role in its development. Find and summarise a resource that describes **ONE** such individual. The individual should have had a significant influence on the development of computers and/or components of modern computing architecture. |
| Title and Reference: **John Von Neumann** **References**  1. History, T. (2017). *John von Neumann - Computing History*. [online] omputinghistory.org.uk. Available at: http://www.computinghistory.org.uk/det/3665/john-von-neumann/ [Accessed 12 Sep. 2017]. 2. Thefamouspeople.com. (2017). *Who is John von Neumann? Everything You Need to Know*. [online] Available at: https://www.thefamouspeople.com/profiles/john-von-neumann-481.php [Accessed 12 Sep. 2017]. |
| Summary:  Born as Neumann János Lajos in Budapest(Hungary), Von Neumann was a Hungarian American polymath whose expertise in the field of Mathematics, physics, economics, and computing have made remarkable effects in the history of mankind. As a prodigy, he developed a keen interest in Mathematics, especially calculus. He graduated and later earned a Ph. D. in mathematics and later studied under Dr. Hilbert.  His noted works include research papers in:   1. Mathematics: Set Theory, Operator Theory, Geometry, Lattice Theory, Linear Programming 2. Physics: Fluid Dynamics, Quantum Mechanics, Development of nuclear weapons at Manhattan project 3. Computing: Von Neumann architecture, self-replicating machines, Automata Theory, stochastic computing, Merge sort algorithm 4. Economics: Theory of Games and Economic Behavior   His concept of universal constructor preceded the discovery of the structure of DNA. His idea of self-replicating computer programs created the concept of virus. He performed world’s first weather forecast and laid the theory of global warming. Along with Shannon and Turing, he proposed the design of an electronic computer that contains a Central Processing Unit (composed of an ALU and a CU), memory for storing data & instructions, external storage and input/output mechanism. This is the designing principle of nearly all modern stored program computing devices.  His remarkable contribution in the field of computing and mathematics is a reason for selection in the resource. |

|  |
| --- |
| **Week 2** |
| The text discusses the components and activities of operating systems however is largely silent on the individuals who played a role in their development. Find and summarise a resource that describes **ONE** such individual. The individual should have had a significant influence on the writing or development of operating systems. |
| Title and Reference: **Linus Torvalds** **References**  1. Linfo.org. (2017). *Linus Torvalds biography by The Linux Information Project*. [online] Available at: http://www.linfo.org/linus.html [Accessed 12 Sep. 2017]. 2. The Linux Foundation. (2017). *10 Years of Git: An Interview with Git Creator Linus Torvalds - The Linux Foundation*. [online] Available at: https://www.linuxfoundation.org/blog/10-years-of-git-an-interview-with-git-creator-linus-torvalds/ [Accessed 12 Sep. 2017]. |
| Summary: Disappointed with non-programmable and less efficient operating systems, a Finnish computer programmer decided to create his own OS (with C programming language) which could be reprogrammed and efficiently utilized hardware. Born in a Finnish family, Linus was an enthusiastic programmer since his childhood. He was a student and researcher at the University of Helsinki.  He wrote the code from scratch and later released it as ‘Linux’ under GNU General Public License so that it could be studied, utilized, modified and redistributed for further improvements. Even after the release of its first code in 1991, Linux remains publicly open and is extendible by its contributing developers. Linux is portable, reliable and stable and hence various leading firms like Intel, Corel, and Netscape supported Linux as an inexpensive alternative to proprietary OS. Later it was used to write the kernels for Android, Chrome OS and many others, which means more than a billion devices on this planet use Linux (including 97% of Supercomputers).  Linus also invented Git, a distributed version control software used widely by developers all around the globe. All his works, be it Linux or Git are working on the idea of open source distribution of software code so that his works remain extensible and available to all without any cost. Even after so many years of writing Linux kernel, he remains the benevolent dictator of Linux world, providing access to a powerful OS with restrictions on what can be done with it.  His remarkable effect in open source software and contribution in building Linux is the reason for selecting the resource. |

|  |
| --- |
| **Week 3** |
| The Internet didn’t just appear – it was an evolution from earlier networks. Find and summarise a resource that describes **ONE** of the networks that led to the development of the modern Internet. |
| Title and Reference: **ARPANET** **References**  1. Encyclopedia Britannica. (2017). *ARPANET | Definition & History*. [online] Available at: https://www.britannica.com/topic/ARPANET [Accessed 12 Sep. 2017]. 2. SearchNetworking. (2017). *What is ARPANET? - Definition from WhatIs.com*. [online] Available at: http://searchnetworking.techtarget.com/definition/ARPANET [Accessed 12 Sep. 2017]. |
| **Summary :** Acronym for Advanced Research Projects Agency Network (ARPANET), ARPANET was the earliest developed packet switching network that worked on TCP/IP protocol. It was the technological initiative of what we call as the internet in today’s modern world.  The key idea was to connect two university computers to send and receive messages and share the scientific information of various researchers in the universities. When ARPANET first came into existence, first two nodes were established between UCLA and Stanford Research Institute (SRI) in [1969](https://www.computerhope.com/history/1969.htm) followed by UCSB and the University of Utah. The network grew from just 4 hosts to 213 hosts across the US.  Larry Roberts was the designer of the technical standards. He also implemented Clark’s suggestion of using mini computers as IMP(Interface Message Processor), rather than large mainframe ones. These IMPs were nodes in the network. Vint Cerf and Robert Kahn are credited for the invention of TCP/IP protocol, which was deployed in 1982. This was made possible by dividing data into small packets and these packets were routed to their destination and would be reconstructed at points called routers. By 1973, the network was connected with satellites and declared operational in 1975.  This could also help military during any war. It was created to survive nuclear attacks, by distributing whole data at all nodes. Hence, this secure network also laid the foundation of a distributed server architecture.  It is the root of all network communication we have today, and hence it was selected for resource. |

|  |
| --- |
| **Week 4** |
| Ethernet is an example of a Layer Two (L2) data link protocol that is discussed in the text. Find and summarise a resource that describes the features and uses of **ONE** other L2 protocol that is not discussed in the text (i.e. **NOT** Ethernet). |
| Title and Reference: **Spanning Tree Protocol** **References**  1. dummies. (2017). *Spanning Tree Protocol (STP) Introduction - dummies*. [online] Available at: http://www.dummies.com/programming/networking/cisco/spanning-tree-protocol-stp-introduction/ [Accessed 12 Sep. 2017]. 2. Support, T., Switching, L., Protocol, S. and TechNotes, C. (2017). *Understanding and Configuring Spanning Tree Protocol (STP) on Catalyst Switches*. [online] Cisco. Available at: https://www.cisco.com/c/en/us/support/docs/lan-switching/spanning-tree-protocol/5234-5.html [Accessed 12 Sep. 2017]. |
| Summary: Spanning tree protocol is used to create Ethernet networks which are constructed with the help of bridges and switches without any bridge loops. As the name suggests, it creates a spanning tree (a tree is a graph without any loops).  It is used when two computers are connected by more than one bridge and there is a possibility of multiple paths for the flow of data. After applying the protocol, the result may have repeated or redundant links but it is free from any loop. The redundant links are also important as backups in case of link failures.  STP is a Layer 2 protocol that passes data back and forth to find out how the switches are organized in the network and then takes all the information and uses it to create a logical tree.  The algorithm has following steps:   1. **Selecting the root bridge:** The bridge with smallest bridge ID is selected as the root bridge. First priority portions are compared and in case they are equal, MAC address is compared. 2. **Determining the least cost paths to the root bridge:** Among all available paths from a node to bridge select the one which has least cost associated with it. 3. **Disable all other parts:** All other ports, which are not part of the spanning tree, are blocked paths. 4. **Breaking ties:** Break ties in case if we find one by selecting one with lower root ID, cost, sender bridge ID and sender port ID. |

|  |
| --- |
| **Week 5** |
| The text mentions the role of hackers in attacks on networked infrastructure. Find and summarise a resource that describes **ONE** famous or well-known hacker. |
| Title and Reference: **Kevin Mitnick** **References**  1. Knowbe4.com. (2017). *Kevin Mitnick | KnowBe4*. [online] Available at: https://www.knowbe4.com/products/who-is-kevin-mitnick/ [Accessed 12 Sep. 2017]. 2. Mitnicksecurity.com. (2017). *The World's Top Security Testing Team | Mitnick Security*. [online] Available at: https://mitnicksecurity.com/ [Accessed 12 Sep. 2017]. |
| Summary: Often attributed as World’s most famous black hat hacker, Kevin Mitnick turned into a white hat hacker who now sells his skills of penetration testing, security assessment and trains other firms towards a safe internet usage.  His firm, Mitnick Security provides security consultancy to almost every leading firm (Fortune 500 companies) and Federal Bureau of Investigation(FBI). He has been teaching social engineering to various public and private agencies.The most famous security speaker and the best-selling author was once the most wanted hacker in the world because he illegally broke into networks of Nokia, IBM, Motorola and many other firms.  In 1995, he was arrested on the charges of illegal copying of valuable proprietary software, stealing and intercepting passwords, breaking networks with his cloned phones and damaging computers. He was sentenced to 5-year imprisonment for his wired frauds and false identification. He was released in 2003.  From then he has turned his skills to provide security consultancy to other firms and his firm boasts of its hundred percent successful track record. He is also the author of three computer security books and his autobiography:  **The Art of Deception, The Art of Intrusion, Ghosts in the wire (**autobiography**) and The Art of Invisibility**.  He is the most famous hacker and lead security consultant, author and speaker. He is the most suitable choice for the resource. |

|  |
| --- |
| **Week 6** |
| Society is increasingly reliant on networks and network technologies but they are evolving at a rapid pace. Find and summarise a resource that describes **ONE** example of a future networking technology or trend that will impact society. |
| Title and Reference: **Li-Fi** **References**  1. Anon, (2017). [online] Available at: https://www.sciencealert.com/li-fi-tested-in-the-real-world-for-the-first-time-is-100-times-faster-than-wi-fi [Accessed 12 Sep. 2017]. 2. Mercer, C. (2017). *Li-Fi explained | What is it, how it works & why Wi-Fi might be a thing of the past*. [online] Techworld. Available at: https://www.techworld.com/data/what-is-li-fi-everything-you-need-know-3632764/ [Accessed 12 Sep. 2017]. |
| Summary: In this era of the overcrowded (data communication) world, Li-Fi has evolved as a new way of wireless communication that uses LED lights to transmit data wirelessly. Harald Hass, a German physicist proposed this technology in a TED (Technology, Entertainment, Design) Global Talk in 2011 on Visible Light Communication (VLC).  It operates like an incredibly advanced form of Morse code - just like switching a bulb on and off according to a certain pattern can reveal a message, flicking an LED on and off at high speeds can be used to write and transmit data in binary code (similar to that in optical fibers).  Li-Fi is a wireless optical networking technology uses light emitting diodes (LEDs) for transmission of data in form of visible light, analogous to Wi-Fi that uses radio waves. The device which is analogous to Wi-Fi routers are LED bulbs and hence claims to be 100 times faster than standard Wi-Fi. A photodetector is accommodated to modulated and demodulate the signals received in form of visible lights.  It complies with the IEEE standard IEEE 802.15.7. The IEEE 802.15.7(similar to Wi-Fi’s IEEE 802.11) is a high-speed, bi-directional and fully networked wireless communication technology based standard.  Although it boasts about its ultra high-speed data transfer, it cannot penetrate walls and therefore not suitable for public networks. But it is more secure and safe and hence it is under testing stage. I will soon be available and change the way we have been transmitting data.  The technology will revolutinize the way of data transfer data and therefore it was chosen. |

|  |
| --- |
| **Week 7** |
| The text mentions social business and the impact of the use of social networking platforms. Find and summarise a resource that describes the history of the development of **ONE** such social media platform. |
| Title and Reference: **Twitter** **References**  1. November Learning. (2017). *Twitter as a Powerful Educational Tool | Using Twitter Hashtags*. [online] Available at: http://novemberlearning.com/educational-resources-for-educators/teaching-and-learning-articles/how-twitter-can-be-used-as-a-powerful-educational-tool/ [Accessed 12 Sep. 2017]. 2. ThoughtCo. (2017). *Social Media in Politics - Twitter and Facebook as Campaigns Tools*. [online] Available at: https://www.thoughtco.com/how-social-media-has-changed-politics-3367534 [Accessed 12 Sep. 2017]. |
| Summary : Broadcasting short messages in order to connect with other people is termed as microblogging. With 241 million monthly active users and 500 million ‘tweets’ sent every day, Twitter has just redefined microblogging with its name.  If you are interested in some sports or follow any celebrity, just search it using a #(hashtag).Want to educate yourself or read something interesting and trending or even build a private professional network for co-workers, twitter is very suitable for your need.  There is a limit of 140 characters on every tweet that results in witty, interesting and relevant messages and makes it easy for readers to scan. It is malleable before the user and hence proven to be incredibly useful for sharing opinions.  Twitter has also evolved as a great marketing tool, which is suitable for both- B2B and B2C marketing. Firms have started using it for instant customer service by creating real time feedback loops. They use to manage their reputation in the market by ensuring customer satisfaction and advertisements.  The prevalence of twitter in politics has made officials and candidates for public office more accountable and accessible to voters. The capability of ‘Larry’(official symbol of twitter) to publish contents and broadcast it to millions of readers instantaneously helps campaigns to carefully manage their candidates’ images based on rich sets of analytics at almost no cost.  Twitter has taken message broadcasting to another level and affected lives of individuals hence this social networking site is suitable choice. |

|  |
| --- |
| **Week 8** |
| With the advent of mass data collection and storage has come data mining. Find and summarise a resource that describes **ONE** example where data mining has been used successfully by a business. You should not use any examples covered in the textbook. |
| Title and Reference: **Smart buildings and Sustainable Developments** **References**  1. Buildingefficiencyinitiative.org. (2017). *What is a Smart Building? | Building Efficiency Initiative | WRI Ross Center for Sustainable Cities*. [online] Available at: http://www.buildingefficiencyinitiative.org/articles/what-smart-building [Accessed 12 Sep. 2017]. 2. Tracy, P. and Tracy, P. (2017). *What is a smart building and how can it benefit you?*. [online] RCR Wireless News. Available at: https://www.rcrwireless.com/20160725/business/smart-building-tag31-tag99 [Accessed 12 Sep. 2017]. |
| Summary: The earth is a planet with limited resources and never-finishing wants of the human race will lead to their depletion. Hence, there is a need of carefully utilizing the resources so that they are available for upcoming generations.  Smart buildings are one such concept, which is needed for sustainable developments. A structure that controls its ventilation, lighting, security and other resources itself by the use of sensors, microchips is called a smart building. With the use of artificial intelligence, a building can be trained to utilize its resources carefully to minimize waste, reduce energy consumption and optimize space usage.  Any building can be made smart by connecting its core systems e.g. power meters, pumps, fire alarms to sensors and control systems. There are benefits ranging from energy savings to productivity gains and sustainability. Smart building strategies can reduce energy costs, increase the productivity of the facility staff, improve building operations, support sustainability efforts and enhance decision-making. The various methods for process optimization and increase efficiency are:   1. Optimize cooling and ventilation equipment 2. Matching occupancy patterns to energy use 3. Proactive maintenance of equipment 4. Dynamic power consumption   Construction of smart buildings will lead to the more efficient use of resources and hence ensure its availability for our upcoming generations. |

|  |
| --- |
| **Week 9** |
| One of the greatest success stories in application development in recent times has been the popularity of mobile apps. Find and summarise a resource that describes the story of **ONE** successful mobile app developer. |
| Title and Reference: **Andy Rabin** **References**  1. Crunchbase.com. (2017). *Andy Rubin - Founder & Chief Executive Officer @ Playground Global | crunchbase*. [online] Available at: https://www.crunchbase.com/person/andy-rubin#/entity [Accessed 12 Sep. 2017]. 2. Successstory.com. (2017). *Andy Rubin Story - Bio, Facts, Networth, Family, Auto, Home | Famous Founders | SuccessStory*. [online] Available at: https://successstory.com/people/andy-rubin [Accessed 12 Sep. 2017]. |
| Summary: Credited with the creation of Operating Systems which run on more than 2 billion devices over the globe, Andrew E. Rubin (also known as Andy) was fascinated by the latest electronic gadgets since his childhood. He worked as a robotics engineer in Carl Zeiss AG. Later he was offered a job at Apple Inc.He also worked in MSN TV and founded Danger Inc. in 1999. The firm was later acquired by Microsoft. Andy wanted to develop smart mobile phones that were more in synchronization with user’s location and preferences. He wanted to create a phone that was user’s assistant.  This led him to create Android in 2003 and he served as its CEO until 2005. Google acquired Android in 2005 and appointed Andy as Senior Vice President of Android. Android OS revolutionized the smartphone market. It has support for 2D as well as 3D graphics. It currently has the largest application store(know as Playstore). Embedding various sensors into a single smartphone, a smart phone could now measure temperature, speed, height, find routes, directions- Andy’s dream has turned into reality.  Later he managed the robotics division of Google, the post which he left in 2014. Peter Barrett, Matt Hershenson, Bruce Leak and Andy collaborated to form Playground Global, a tech incubator which supports other startups and has drawn investments from leading firms like Google, Seagate Tech., Foxconn, HP. Andy is also co-founder of Essential Products Inc. and Redpoint Ventures.  He is the man who saw the dream and brought smartphones into the lives of individuals making lives easier and hence I chose him. |

|  |
| --- |
| **Week 10** |
| While information systems and technology deliver many benefits to society, they can also result in (sometimes inadvertent) negative effects and outcomes. Find and summarise a resource that describes **ONE** example of where the use of an information system or technology has led to negative consequences for humans. |
| Title and Reference: **Packet Capturing** **References**  1. Linuxjournal.com. (2017). *Packet Sniffing Basics | Linux Journal*. [online] Available at: http://www.linuxjournal.com/content/packet-sniffing-basics [Accessed 12 Sep. 2017]. 2. Techopedia.com. (2017). *What is Packet Capture? - Definition from Techopedia*. [online] Available at: https://www.techopedia.com/definition/25333/packet-capture [Accessed 12 Sep. 2017]. |
| Summary: The data moves over network in form of packets which can be intercepted by the use of suitable hardware and software. A stored packet can be use for analysis, diagnosis and solving problems in a network. This helps in determining if security policies are being followed or how smoothly the data flows in a local network. Network managers use it to analyse and network traffic management.  It is used to identify security flaws and points of intrusion, identifying data leakage, troubleshooting and cyber forensics *.*But hackers use this technique to steal data that is flowing through the network.  It is implemented in various ways:   1. Filtering data flow through any specific device 2. Complete/Full capturing   It can be used to steal passwords, credit card numbers with the help of packet sniffing tools.  These tools capture the data packets and analysing tools convert these packets into plain text data. Hence, any encrypted information is not easy to be detected. Hackers all over the world are using this network monitoring technique to steal private and sensitive data about others and hence making public networks unsafe. This often leads to intrusion attacks, loss of data, privacy and sometimes even financial damage to the victim of such attacks. |

|  |  |  |
| --- | --- | --- |
| **MARKING SHEET - DO NOT DELETE** | | |
| **Criteria** | **0** | No Response |
| **<=1** | Poor resource selection; resource is too broad or lacks relevance to the task; summary fails to explain what the resource was about; the relevance and/or usefulness of the resource has not been explained. |
| **<=2** | Good resource selection; resource is relevant to the task; summary is adequate but may require either more detail or is too long; the relevance and/or usefulness of the resource has been explained to some extent, but needs additional information. |
| **<=3** | Excellent resource selection; resource is highly relevant to the task (the resource is probably highly specialised); summary is detailed yet concise; the relevance and usefulness of the resource selection has been clearly explained. |
| **Key Deductions** | **-3**  **-2  -1** | Reference/URL provided does not link to resource (and resource cannot be located or determined from details provided) OR Reference/URL provided does not relate to the summary (i.e. summary is not of resource content / contains content not contained in the resource)  Resource is generic AND/OR covers multiple technologies/examples rather than focuses on a single technology/example  Resource not referenced correctly/not in Harvard format |
| **Week** | **Marks Awarded** | |
| **1** |  | |
| **2** |  | |
| **3** |  | |
| **4** |  | |
| **5** |  | |
| **6** |  | |
| **7** |  | |
| **8** |  | |
| **9** |  | |
| **10** |  | |
| **TOTAL** |  | |
| **Comments:** | | |