Solution and Answer Guide

Bidgoli, MIS 2024, 9780357883860; Module 02: Computers and Their Business Applications

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# Reviews and Discussions

1. Define a computer and its main components.

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| **Answer:** A computer is a machine that accepts data as input, processes data without human intervention by using stored instructions, and outputs information. A computer system consists of hardware and software. Hardware components are physical devices, such as keyboards, monitors, and processing units. The software component consists of programs written in computer languages. |

1. What are five generations of computer hardware?

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| **Answer:** Vacuum tube, transistors, integrated circuits, miniaturization, and parallel processing. |

1. Computers derive their power from three factors. What are these three factors?

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| **Answer:** Speed, accuracy, and storage and retrieval capabilities. |

1. What are three basic computer operations?

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| **Answer:** Computers can perform three basic tasks: arithmetic operations, logical operations, and storage and retrieval operations. |

1. List two examples apiece of input, output, and memory devices.

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| **Answer:**  Input (keyboard and mouse)  Output (printer and platter)  Memory (main memory and secondary memory) |

1. What are four classes of computers?

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| **Answer**: Subnotebooks, notebooks, personal computers, minicomputers, mainframes or supercomputers. |

1. What is the difference between application software and system software?

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| **Answer**: Application software is used to perform specialized tasks. Microsoft Excel, for example, is used for spreadsheet analyses and number-crunching tasks.  Systems software works in the background and takes care of housekeeping tasks, such as deleting files that are no longer needed. For example, system software such as Microsoft Windows is the operating system for most PCs. |

1. What are four key principles of OOP?

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| **Answer**: Abstraction, inheritance, polymorphism, and encapsulation are four key principles of OOP. |

# Projects

1. A local law firm needs your advice. It currently has 20 PCs being used by its attorneys and staff, and it is debating whether to use Google Apps for Work or Office 365 as its productivity tools. Write a two-page paper that summarizes your recommendation. What are two advantages and two disadvantages of each choice? Which alternative is less expensive? What are two advantages of Office 365 over traditional Office?

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| **Solution:** Answers will vary. Two advantages of Office 365: It is cloud-based and used as a collaboration tool. Two disadvantages of Office 365: Must have Internet access and may have compatibility issues with an organization’s systems and devices.  Two advantages of Google Apps for Work: It is easy to start and use and is cost efficient. Two disadvantages of Google Apps for Work: High starting cost and may have compatibility issues with an organization’s systems and devices. |

1. Object- Object-oriented programming (OOP) is increasingly being used for application and software development. After reading the information presented in this module and other sources, write a one-page paper that describes three advantages of OOP methodology. Reuse of codes for other purposes is among the advantages of OOP. Explain how this is achieved. Also list four programming languages that are based on this methodology.

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| **Solution**: Answers will vary. Four programming languages that are based on OOP include Java, JavaScript, Python, and C++. |

1. A classmate of yours is not sure whether to buy a PC or a tablet. Your classmate needs the device for schoolwork (mostly Microsoft Office), for Web access, and as an e-reader. After reading the information presented in this module and other sources, write a one-page paper that summarizes your recommendation to this fellow student. Also mention two choices that you consider as top of the line for each alternative.

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| **Solution:** Answers will vary  Top of the line Tablet: Apple iPad Pro and Samsung Galaxy Tab.  Top of the line Desktop Computers: Apple Mac and Dell Inspiron. |

1. IBM Watson has created a lot of excitement in the computing field. After reading the information presented in this module and other sources, write a one-page paper that summarizes three commercial applications of this platform. What are two advantages of using Watson compared to using humans in the medical field? What are two disadvantages? How can Watson be used as a trip-planning service?

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| **Solution:** Answers will vary. Three commercial applications of IBM Watson include using it as shopping companion, as a news service, and for medical diagnostics.  What are two advantages of using Watson compared to using humans in the medical field? Using Watson is like using a robot versus a human discussed in Module 13. It will never get tired or distracted.  Watson as a trip-planning service will be able to search a vast database related to places to visit and or activities to do and present several options it to a user to choose from. |

1. Android and iOS are two major operating systems for smartphones and other mobile devices. After reading the information presented in this module and other sources, write a two-page paper that summarizes the key features of each OS. What are two advantages and two disadvantages of each? Which OS has a bigger market share and why?

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| **Solution**: Answers will vary.  Two advantages of iOS: High performance and generates less heat when compared to Android.  Two disadvantages of iOS: It is not Open Source and Apps are usually more expensive when compared to Android.  Two advantages of Android: More phone choices and it targets multiple platforms.  Two disadvantages of Android: Overheating and it includes a lot of “overhead” in the background that lead to the battery quickly drains. |

1. Dragon NaturallySpeaking Solutions is an example of an NLP. After reading the information presented in this module and other sources, write a two-page paper that describes five commercial applications for this platform. Which businesses will benefit the most from this platform? What are two other products that compete with this software?

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| **Solution:** Answers will vary. Some of the commercial applications of Dragon NaturallySpeaking Solutions include fast document creation, streamlining data collection, automating repetitive computing tasks, and empowering workers with disability.  Two products that compete with this software include AT&T Natural Voices Wizzard Speech (<https://wizzardsoftware.com/>) and e-Speaking (https://e-speaking.com). |

# Module Quiz

1. Application software can be commercial software or software developed in-house; it is used to perform a variety of tasks on a personal computer. True or False?

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| **Answer:** True.  The other type of software is system software such as Microsoft Windows which is the operating system for most PCs. |

1. Machine language is the first generation of computer languages and consists of a series of 0s and 1s representing data or instructions. True or False?

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| **Answer:** True.  There are five generations of computer languages: machine language, assembly language, high-level language, fourth-generation language, and natural language processing. |

1. The arithmetic logic unit (ALU) performs only arithmetic operations. True or False?

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| **Answer:** False.  The arithmetic logic unit (ALU) performs arithmetic operations (+, -, \*, /) as well as comparison or relational operations (<, >, =); the latter are used to compare numbers. |

1. Choose the wrong answer:
2. The first generation of computers is identified by vacuum tubes.
3. The second generation of computers is identified by transistors.
4. The third generation of computers is identified by miniaturization.
5. The fourth generation of computers is identified by VLSI, personal computers, and optical discs.

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| **Answer:** C  The third generation of computers is identified by integrated circuits, remote data entry, and telecommunications. |

1. All of the following are among the advantages of object-oriented programming except:
2. Modularity
3. Reuse of codes for other purposes
4. Effective problem solving
5. All of these choices

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| **Answer:** D  An object-oriented programming (OOP) language is organized around a system of objects that represent the real world, as opposed to a series of computational steps used in traditional languages. |

1. Choose the wrong answer:
2. The first generation of computer languages is machine language.
3. The second generation of computer languages is assembly language.
4. The third generation of computer languages is high-level language.
5. The fourth generation of computer languages is natural language processing.

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| **Answer:** D  Fourth-generation languages (4GLs) use macro codes that can take the place of several lines of programming. The commands are powerful and easy to learn, even for people with little computer training. |

# Case Studies

## Case Study 1-1

1. What are some examples of analytics that can be done using financial apps?

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| **Solution:** For example, you can establish a budget and keep track of the expenses in various categories, such as food, gas, and groceries. |

1. How are these new financial apps changing the banking industry? Are the new tools primarily coming from new entrants or longstanding companies?

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| **Solution**: Answers will vary. The new tools are coming from both. |

1. What is a robo-advisor? Which factors should an investor consider before selecting an investing option?

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| **Solution**: A “a robo-advisor” is a method to automate the asset allocation of investments using a computer algorithm. When it comes to investing a typical investor has three choices: do-it-yourself, a robo advisor, or a financial advisor. Which option to choose depends on several factors such as the cost of the investment, age of the investor, amount of investment, his or her risk tolerance, and knowledge of investing. |

## Case Study 1-2

1. What impact does this new technology have on outage reporting and response time?

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| **Solution**: Answers will vary. In the past when there was an outage related to power, water, or steam (used for heating), the utility manager was contacted by phone to look into the problem and come up with a course of action to fix the problem. |

1. What are the two apps that are being used by the utilities department?

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| **Solution**: The equipment used by Cornell University’s utilities department comes from GE and has an iOS app for drilling down into the utility management system and analyzing the available data. The utility personnel have access to a Web app for those analyses that are not suitable for the iOS app. |

1. How could this technology approach be used in other settings?

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| **Solution**: Answers will vary. According to the university, the iPad provides easy access to key information anywhere and at any time. The utility personnel can use the Web app to remotely control the utility management system from their browsers. The same advantages could be gained in other settings. |

# Rubrics

## MIS For Life Rubric

## Reflection Activity Rubric