

Open-book test. No collaboration in any form allowed.

Part I. For each of the problems A to E below, write down your python program on paper.

#A: About Variables and Strings:

Write a Python program that (i) asks the user to input a positive real number as the width of a rectangle, (ii) converts the input into a real number and stores it in a variable, (iii) asks the user to input another positive real number as the height of the rectangle, (iv) reads and converts the input into a real number and stores it in a variable, and then (v) determines the area of the rectangle given its width and height and prints out the result to the user.

#B: About Basic Math, Decision Control and Conditional Statements:

Write a Python program that (i) asks the user to input a positive integer, (ii) reads and converts the input into a integer and stores it in a variable, and then (iii) prints out the remainder of the integer divided by 4 and the remainder of the integer divided by 3 respectively.

#C: About Decision Control and Conditional Statements:

Write a Python program to ask the user to input a positive integer. Read and convert the input into an integer and store it in a variable, and then

- i. check whether it is **divisible by 4 or by 3** and if it is, print a message to say yes;
- ii. check whether it is **divisible by 4 and by 3** and if it is, print a message to say yes;
- iii. check whether it is **divisible by 4 but NOT by 3** and if it is, print a message to say yes.

#D: About Loops:

Write a Python program that uses a loop to print out all the positive integers that are less than 100 and are **divisible by 4 but NOT by 3**. Properly set up a variable to store and count the number of the integers printed. After the loop, report the total number of the integers printed.

#E: Application

A buffet restaurant charges their customers according to the age and whether it is Sunday. If it is Sunday, everybody is charged a flat price of \$15. However, when it is not Sunday, then it depends on the age and the rules described in the following: If a person is less than 12 years old, the cost is \$3 dollars plus the age. (For example, a 6-year-old child will be charged for \$9

dollars). If the person is at least 12 years old but no more than 65 years old, the cost is \$15.0. For a senior who is more than 65 years old, they charge \$10.

Write a Python program that first asks the user to enter either *Y* or *N* to indicate whether it is Sunday and then asks the user to enter the age of the customer. The program should then determine the cost accordingly and print out the cost.

Part II.

For #1-19, answer either true or false. For #20, write down your estimates.

- 1. It is very likely that a computer virus can migrate from one computer to another when someone uses an infected flash drive on different computers**
- 2. An autonomous system is a complex system that assumes almost full responsibility for a task without human input, verification, or decision making.**
- 3. Requesting passwords and other sensitive data under false pretenses is called phishing.**
- 4. A malware is a software robot that explores the Web and retrieves information about pages and indexes the information in a database.**
- 5. RAID allows multiple hard disks to operate as a single unit, providing the ability to keep copies of important data in several locations.**
- 6. A virus that attaches itself to documents with embedded programs that automate tasks is called a macro virus.**
- 7. The TCP/IP protocol is only used to upload web pages to and download web pages from web servers.**
- 8. Bombarding servers and Web sites with bogus traffic until they are shut down is**

called a denial-of-service attack.

9. Internet-connected computers that have been hijacked using viruses to perform malicious acts without the knowledge of their users and owners are called Zombies.
10. A uniform resource locator (URL) is made of a protocol, the address of the host that contains the resource, and the path to the specific resource on the host.
11. The World Wide Web is a distributed browsing and searching system developed at MIT by Tim Berners-Lee.
12. The type of programs that gather user information and send it to an outside source through the Internet without the knowledge or consent of the user is called Spyware.
13. The Internet is decentralized. However, it is tightly controlled by a joint international commission from the United States and a couple of other industrial nations.
14. The TCP/IP protocol is the backbone language of the Internet, which allows cross-network communication between different types of computers and networks.
15. Symmetric secret key systems are often used on computer networks for encryption and decryption.
16. Most computer viruses are operating-system specific.
17. The contents of an email message may be divided into many small units in the communication process of reaching its destination. Such a small unit is called a packet, which is a small portion of an Internet message that has all the information routers need to transfer sections of information from network to network toward the destination.
18. IPv6 supports multicast, which is a successor of IPv4 and solves the shortage-of-addresses problem for IP addresses.
19. Mapping domain names to numerical IP addresses is accomplished by the Internet's DNS service.

20. Please answer the following two questions:

- **Roughly estimate the number of hours each week you spent in reading and other assignments in this course.**
- **In a 0-5 scale with 5 meaning the best one can put into a course, how would you rate the overall effort you have put into the learning process of this course?**