香港公開大學　科技學院
THE OPEN UNIVERSITY OF HONG KONG
SCHOOL OF SCIENCE AND TECHNOLOGY

ELEC S212

Network Programming and Design

2018 Autumn Presentation

Assignment 3

Please e-submit this assignment via the OLE
by **9 March 2019, 23:59**

Preamble

Dear ELEC S212 Students,

You must submit your answers to this assignment by the cut-off date: **9 March 2019**.

If you need to seek permission to submit your assignment after this date, then make your request through the OLE **before the cut-off date**. Failure to obtain permission for late submission will result in OLE rejecting the mark awarded by the tutor.

There are FIVE questions in this assignment. You should submit it and the associated source codes in zipped format and upload it to the OLE e-submission system.

You can use the server 103.247.158.246 for development and testing purpose. As we anticipate some students' code may crash the server, do backup your data!!

Steven Choy
ELEC S212 Course Coordinator

Question 1 (20 marks)

(a) Give three major differences between client-side and server-side scripting? **[6 marks]**

(b) Both Flash and Java Applet are the client side technology. Study these technologies and give three major differences of them? **[6 marks]**

(c) Both Perl and PHP are the server side technology to add programming logics and capabilities to a web application at the backend. PHP supports a very useful feature for writing PHP-based web application that makes the development process much straightforward. We don't see this feature in Perl. Find out what this feature is. **[4 marks]**

(d) Describe the key differences between a dynamic web page and a static web page. **[4 marks]**

(Hint: Read **Lab 2.4** - Internet Application Development using PHP.)

Question 2 (30 marks)

One of the major advantages of the World Wide Web (WWW) is its ability to reach out global audience. In order to capture information of potential clients or members around the globe, businesses or event organizers often need to implement some database applications to manage memberships or customer records. Please complete the **Lab 2.5**: Flat-file database development with CGI. In this lab, you will be guided to implement a basic web database for such purposes. The database is implemented by a plain text file. It can be accessed via the provided CGI scripts written in Perl.

What to submit?

(a) The URL link to access the registration page (i.e. the result after Step 4) **[10 marks]**

(b) The URL link to view the current database record (i.e. the result after Step 5) **[5 marks]**

Students have to make sure that the above pages must be able to perform the functions they are designed for, in order to earn the corresponding marks.

(c) Your answer to the Question 1 (**of the Lab 2.5**). **[5 marks]**

(d) Implement a solution for Question 3 and provide the URL link to such solution. **[10 marks]**

Question 3 (20 marks)

Protecting a web site can be a laborious task since web sites face countless threats from all over the Internet around the clock. Please complete the **Lab 1.8** – Setting up password protection for your website.

What to submit?

(a) The resulted URL link after completing the procedure (Step 1 – 5), together with a valid pair of user name and password. **[12 marks]**

(b) Apply the learned password protection technique to the web pages you produced in **Question 2.** Again, provide a valid pair of user name and password to access these protected pages. **[8 marks]**

Question 4 (10 marks)

(a) What are the four key goals for computer security? Provide a brief description for each of them. **[4 marks]**

(b) IPSec and SSL are the two popular security protocols of the Internet. Compare them in terms of where and how they operate, what they protect, and typical applications of them. **[6 marks]**

Question 5 (20 marks)

A company would host a web server in their corporate network, for access by external customers over the Internet. Design a secure network that could fit the following requirements:

1. An external network segment for reaching external networks/hosts over the Internet;
2. A demilitarized zone (DMZ) for hosting the web server and other security equipment;
3. Internal segments for hosting internal servers and hosts;
4. Different segments can communicate properly;
5. Proper protection for DMZ against external attacks;
6. Proper segmentation/protection for different type of network segments;

(a) Prepare a network diagram showing the network segments required as above (1 – 3), essential routing equipment (4) , and key security equipments (5 – 6); **[10 marks]**

(b) Describe at least two pieces of security equipments you have used in part (a). **[4 marks]**

(c) Help set up the firewall rules so that all external hosts can access the web server (IP: 202.198.64.2) for its http and https services, but they CANNOT access any other service. Provide your answers to (A) – (F). **[6 marks]**

Firewall Rule 1:

Action:	(A)		
Direction:	(B)		
Source IP:	(C)	Source Port:	ANY
Destination IP:	(D)	Destination Port	80, (E)

Firewall Rule 2:

Action: (F)

All other in or out traffics