Answer Key

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Document conventions

Convention	Usage	Example
`Courier New`	Displays code and text commands	`CY_ISR_PROTO(MyISR);` `make build`
Italics	Displays file names and paths	*sourcefile.hex*
[**bracketed, bold**]	Displays keyboard commands in procedures	[**Enter**] or [**Ctrl**] [**C**]
Menu > Selection	Represents menu paths	**File > New Project > Clone**
Bold	Displays GUI commands, menu paths and selections, and icon names in procedures	Click the **Debugger** icon, and then click **Next**.

1.1 Chapter 2

1.1.1 Exercise 2

1) There are two changes required in the wifi_config.h file:
    a. WIFI_SSID changes to “WW101OPEN”
    b. WIFI_SECURITY changes to CY_WCM_SECURITY_OPEN

Note: *You can find all of the security types available by right clicking on CY_WCM_SECURITY_OPEN (or any other security name) and selecting **Open Declaration**.*

1.2 Chapter 4b

1.2.1 Exercise 4

1) Which server port is used for HTTP (non-secure)?
   Port 80.
2) What header(s) is/are sent with each request?
   In this case, three headers are sent:
   Host: httpbin.org
   User-Agent: anycloud-http-client
   X-Amzn-Trace-Id: Root=...
3) What is the variable “connected” used for? Why is it needed?
   The variable “connected” is used to determine if the connection to the server is still active. It is needed because the server can disconnect at any time. Therefore, before sending another request, we need to see if the connection is still there. If not, we need to restart everything.
4) Uncomment the section of code to wait for the server to disconnect between requests. How long does the server wait before closing the connection?
   The server disconnects after about 60 seconds of inactivity.

1.2.2 Exercise 5

1) Which server port is used for HTTPS (secure)?
   Port 443.
2) What function call and parameter specifies that the connection should use TLS?
   The 1st parameter to `cy_http_client_connect` is of type `cy_awsport_ssl_credentials_t` and has all of the TLS information

1.2.3 Exercise 6

1) What headers sent with the POST request?
   There are 5 headers:
   Host: httpbin.org
   Content-Type: application/json
   Content-Length: 18
   User-Agent: anycloud-http-client
   X-Amzn-Trace-Id: Root=...

(back-slashes don't count in the content length)

2) What is the JSON content that is posted?
   The JSON is a key-value pair of {"any cloud":"yes"}

1.3 Chapter 4c

1.3.1 Exercise 5

1) How do the MQTT library functions (e.g. IotMqtt_PublishSync()) get into your project?
   The `#include for "iot_mqtt.h"` in the C file cause the AWS library functions to be included in the project.
2) What function is called when the button is pressed?
   `isr_button_press()`
3) How does the button callback unlock the publisher task?
   It notifies the publisher task by calling:
   ```
   xTaskNotifyFromISR(publisher_task_handle, new_device_state,
   SetValueWithoutOverwrite, &xHigherPriorityTaskWoken);
   ```
4) Are all messages sent to the AWS IOT MQTT Message Broker required to be in JSON format?
   No, but messages that affect the shadow have to be JSON.
5) What steps are required to get an AWS connection established?
   Connect to the network
   Initialize the Cypress Secure Sockets and MQTT libraries
   Set up network info and connection info
   Open the connection using `IotMqtt_Connect()`
6) What function is called to send data to the server?
   `IotMqtt_PublishSync()`

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