Answer the questions below, turn in a hard-copy of your answers in class, and submit your source code to the online submission system by the due date.

**Part 1: Reading Assignment.** Read the following sections in the textbook and write your answers to the questions below.

- Ch 5: 5.1 through 5.1.2

**Part 2: Dynamic SQL.** Use the database you created in HW 4 (based on the CIA World Factbook) to implement the following program. Note that you can use whatever language you would like (e.g., Python, Java, C++) for the assignment. The program you write should act as a simple text-based interface over your database as described below. Note that your program can assume valid values are given except where noted below (the focus here is on practicing using SQL within a programming language, not on your ability to write a text-based UI).

1. After starting your program, it should display the following main menu.

   1. List countries
   2. Add country
   3. Find countries based on gdp and inflation
   4. Update country's gdp and inflation
   5. Exit

   Enter your choice (1-5):

2. If a user selects 1 from the main menu, your program should display the names and codes of all of the countries. Each country should be displayed on a single line as “name (code)”, e.g., United States (US). After listing all of the countries, your program should reprompt the main menu.

3. If a user selects 2 from the main menu, your program should prompt for the following information to add to the database.

   Country code................: US
   Country name.................: United States
   Country per capita gdp (USD): 57466
   Country inflation (pct).....: 2.1

   Once given, your program should (a) check to make sure the same country code does not already exist, and if not, (b) add the corresponding country to the database, and otherwise, (c) notify the user that the country already exists. Once completed, your program should reprompt the main menu.

4. If a user selects 3 from the main menu, your program should prompt for the following information.
Number of countries to display: 5
Minimum per capita gdp (USD)...: 10000
Maximum inflation (pct).......: 5

Once given, your program should then display all countries with a gdp equal to or higher than the value given and an inflation equal to or lower than the inflation given. The countries should be displayed from highest-to-lowest gdp such that if two countries have the same gdp, they should be displayed from lowest-to-highest inflation. Additionally, only the number of countries entered should be displayed. For example, using the example above, if ten countries satisfy the conditions given, then only the first five are displayed, and if only three countries satisfy the above conditions, then only the three are shown. Each country should be displayed on a single line as “name (code), gdp, inflation”, e.g., United States (US), 57466, 2.1. Note that your program should not perform any sorting and should not reduce the size of the result set (i.e., you should use ORDER BY and LIMIT in your prepared statement). After the corresponding countries are displayed, your program should reprompt the main menu.

5. If a user selects 4 from the main menu, your program should prompt for the country code, new gdp, and new inflation.

    Country code................: US
    Country per capita gdp (USD): 57466
    Country inflation (pct)......: 2.1

Once given, your program should (a) check to make sure the country code already exists, and if so, (b) update the corresponding gdp and inflation, and otherwise, (c) notify the user that the country does not exist. Once completed, your program should reprompt the main menu.

6. If a user selects 5, your program should halt.

Turn in a hard-copy print out of your program together with a cover sheet and tests showing your program works correctly in class on the due date. Also, submit your assignment to the online submission system. Please provide any additional instructions I may need to run your program with your design document.