Friday, March 13, 2020.

Programming Fundamentals LAB – Spring 2020

(BS-CS-F19 Morning & Afternoon)

Lab # 4

Instructions:

- **Attempt the following tasks exactly in the given order.**
- **Indent** your code properly.
- Use meaningful variable names. Use the **camelCase** notation to name variables.
- Use meaningful prompt lines/labels for all input/output that is performed by your algorithms.

Write C++ programs for the following tasks:

Task # 1

Write a C++ program which takes three integers (separated by commas), and determines the largest of these three integers. A sample run of your program is given below. Text shown in **red** is entered by the user.

```
Enter three integers: 34,50,11
The largest number is 50
```

Hint: Use `cin.ignore()`

Task # 2

Write a C++ program for solving **Programming Challenge # 16** (*Diamond Pattern*) on **Page 84** of your textbook.

Task # 3

Write a C++ program for solving **Programming Challenge # 7** (*Box Office*) on **Page 145** of your textbook.

Task # 4

Write a C++ program for solving **Programming Challenge # 15** (*Property Tax*) on **Page 146** of your textbook.

Task # 5

Write a C++ program for solving **Programming Challenge # 18** (*Interest Earned*) on **Page 147** of your textbook.

Task # 6

Write a C++ program for solving **Programming Challenge # 20** (*Pizza Pi*) on **Page 148** of your textbook.

Task # 7

Write a C++ program for solving **Programming Challenge # 23** (*Stock Transaction Program*) on **Pages 148-149** of your textbook.

Task # 8

Write a C++ program for solving **Programming Challenge # 24** (*Planting Grapevines*) on **Page 149** of your textbook.

Task # 9

The colors **red**, **blue**, and **yellow** are known as the primary colors because they cannot be made by mixing other colors. When you mix two primary colors, you get a secondary color, as shown here:

- When you mix **red** and **blue**, you get **purple**.
- When you mix **red** and **yellow**, you get **orange**.
- When you mix **blue** and **yellow**, you get **green**.

Write a C++ program that prompts the user to enter the names of two primary colors to mix. User's input should be stored in two variables of type `string`. If the user enters anything other than "red," "blue," or "yellow," the program should terminate after displaying an appropriate error message. Otherwise, your program should display the name of the secondary color that results.

Task # 10

Find the errors in the programs written in **Question # 28 to 33** on **Pages 141-142** of your textbook. Then, write and compile the corrected programs to see their output.

Task # 11

Write the output produced by the programs given in **Question # 34 to 37** on **Pages 142-144** of your textbook. **You should write the output of these programs by hand tracing through them.** Afterwards, you may type and compile these programs to verify your output.

Task # 12

Write a C++ program for solving **Checkpoint # 3.12** on **Page 106** of your textbook.

Task # 13

Write a C++ program which takes a year from the user, and determines whether the year is a **leap year** or not. Note that a year is a leap year if it is divisible by 4 and not divisible by 100, or if it is divisible by 400. For example, years 1900 and 2100 are not leap years, but the year 2000 is a leap year.

Note: In your program, you are **NOT** allowed to use **compound conditions** (i.e. usage of logical operators AND, OR, NOT is not allowed).

Task # 14

Write a C++ program for solving **Programming Challenge # 6** (*Annual Pay*) on **Page 82** of your textbook (Gaddis, 9th Edition).

Task # 15

Write a C++ program for solving **Programming Challenge # 15** (*Triangle Pattern*) on **Page 83** of your textbook.

Task # 16

Write a C++ program for solving **Programming Challenge # 18** (*Energy Drink Consumption*) on **Page 84** of your textbook.

Task # 17

Write a C++ program for solving **Programming Challenge # 20** (*How Much Paint*) on **Page 84** of your textbook.

Task # 18

Write a C++ program for solving **Programming Challenge # 12** (*Celsius to Fahrenheit*) on **Page 146** of your textbook.

Task # 19

Write a C++ program for solving **Programming Challenge # 19** (*Monthly Payments*) on **Pages 147-148** of your textbook.

Task # 20

Write a C++ program for solving **Programming Challenge # 21** (*How Many Pizzas?*) on **Page 148** of your textbook.