Metropolitan State University, Saint Paul, Minnesota

ICS 140 Computational Thinking with Programming

Lab 5

**Booleans and Logical Operators**

This week we have continued exploring selection control structures and have added the concepts of logical operators like “and”, “or” and “not”. We have also discussed a new variable type called Booleans. The following code shows examples for both concepts.

Text

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The program starts by gathering user inputs to see if a user qualifies for a loan. On line 4 we have our first check using the “or” operator. In this case if the user has either a credit score over 500 or has been at their job over 2 years, the Boolean variable **approved** will be set to True and they will be approved for the loan.

On line 6, we start a nested if statement set to determine the interest rate for an approved user. Higher credit scores will result in a lower **interest\_rate**. On line 8, we see an example of the “and” operator. In this case, line 9 is only executed if **credit\_score** is greater than 500 AND **credit\_score** is also less than or equal to 600.

On line 15, we see the **approved** Boolean variable can be used as its own Boolean expression in an if statement to determine which message is displayed to the user.

You can use similar concepts to solve the color mixer programming challenge.

**Color Mixer**

The colors red, blue, and yellow are known as the primary colors because they cannot be made by mixing other colors. When you mix the 2 primary colors, you get a secondary color.

* 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.

Design a program that prompts the user to enter the names of two primary colors to mix. If the user enters anything other than “red”, “blue”, or “yellow” the program should display an error message. Otherwise, the program should display the name of the secondary color that results.

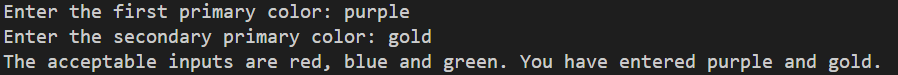
When the program is run it should look something like this:

Text

Description automatically generated

**Text

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Copy the python code in the section below.

**Python Code**

A screenshot of a computer program

Description automatically generated

Take a screenshot of tests running the program for each color combination and paste them below.

**Test Results**

A computer screen shot of a program

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