**Module 7: Lab Activity – Booleans**

**Deliverables:**

* Python program solutions to the following 5 problems

**Make Sure You:**

* Add comments

# Your name

# The date

# What the program does

* Test your program
* Fix any bugs (try out the debugging techniques you read about)

Game Example from How to Think Like a Computer Scientist:

For example, suppose we can slay the dragon only if our magic lightsabre sword is charged to 90% or higher, and we have 100 or more energy units in our protective shield. We find this fragment of Python code in the game:

|  |  |
| --- | --- |
|  | **if** **not** ((sword\_charge >= 0.90) **and** (shield\_energy >= 100)):  print("Your attack has no effect, the dragon fries you to a crisp!")  **else**:  print("The dragon crumples in a heap. You rescue the gorgeous princess!") |

de Morgan’s laws together with the logical opposites would let us rework the condition in a (perhaps) easier to understand way like this:

|  |  |
| --- | --- |
|  | **if** (sword\_charge < 0.90) **or** (shield\_energy < 100):  print("Your attack has no effect, the dragon fries you to a crisp!")  **else**:  print("The dragon crumples in a heap. You rescue the gorgeous princess!") |

We could also get rid of the not by swapping around the then and else parts of the conditional. So here is a third version, also equivalent:

|  |  |
| --- | --- |
|  | **if** (sword\_charge >= 0.90) **and** (shield\_energy >= 100):  print("The dragon crumples in a heap. You rescue the gorgeous princess!") **else**:  print("Your attack has no effect, the dragon fries you to a crisp!") |

**Problem 1** – Write a function that takes two inputs from a user and prints whether they are equal or not.

**Problem 2** – Write a function that takes two inputs from a user and prints whether the sum is greater than 10, less than 10, or equal to 10.

**Problem 3** – Write a function that takes a list and prints if the value 5 is in that list.

**Problem 4** – Write a function that takes a year as a parameter and returns True if the year is a leap year, False if it is otherwise.

Consider the requirements of a leap year:

* The year is evenly divisible by 4
* If the year can be evenly divided by 100 it is NOT a leap year, unless:
  + If the year is also evenly divisible by 400, then it is a leap year.

**Problem 5** - Write a function that checks whether your game character has picked up all the items needed to perform certain tasks and checks against any status debuffs. Confirm checks with print statements.

Game Character has the following item list: [pan, paper, idea, rope, groceries]

Game Character has the following status debuffs: [slow]

Task 1: Climb a mountain – needs rope, coat, and first aid kit, cannot have slow

Task 2: Cook a meal – needs pan, groceries, cannot have small

Task 3: Write a book – needs pen, paper, idea, cannot have confusion