Decision Structure and Boolean Logic

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Chapter 3
Gaddis, T. (2019). Starting out with Python. New York, NY: Pearson

1 Day of the week

```python
In [1]: number = int(input("Enter a number between 1 and 7: "))
        if(number == 1):
            print('Monday')
        elif(number == 2):
            print('Tuesday')
        elif(number == 3):
            print('Wednesday')
        elif(number == 4):
            print('Thrusday')
        elif(number == 5):
            print('Friday')
        elif(number == 6):
            print('Saturday')
        elif(number == 7):
            print('Sunday')
        else:
            print("Out of range")
```

```
Enter a number between 1 and 7: 4
Thrusday
```

2 Areas of Rectangles

```python
In [2]: lenRect1 = float(input('Enter length of first rectangle. '))
        widthRect1 = float(input('Enter width of first rectangle. '))
        lenRect2 = float(input('Enter length of second rectangle. '))
        widthRect2 = float(input('Enter width of second rectangle. '))
        rect1Area = lenRect1*widthRect1
```

```
        rect2Area = lenRect2*widthRect2
        if(rect1Area > rect2Area):
            print("Area of the first rectangle is greater than second rectangle.")
        elif(rect1Area < rect2Area):
            print("Area of the second rectangle is greater than first rectangle. ")
        else:
            print("Area of the second rectangle is the same as first rectangle. ")

Enter length of first rectangle. 4
Enter width of first rectangle. 4
Enter length of second rectangle. 4
Enter width of second rectangle. 4
Area of the second rectangle is the same as first rectangle.
```

3   Age Classifier

```
In [3]: age = int(input("Enter the person's age"))
        if(age < 1):
            print("The person is an infant.")
        if(age >= 1 and age < 13):
            print("The person is a child.")
        if(age >= 13 and age < 20):
            print("The person is a teenager.")
        if(age >= 20):
            print("The person is an adult.")

Enter the person's age34
The person is an adult.
```

4   Roman Numerals

```
In [4]: number = int(input('Enter a number between 1 and 10 (inclusive): '))
        if(number == 1):
            print("I")
        elif(number == 2):
            print("II")
        elif(number == 3):
            print("III")
        elif(number == 4):
            print("IV")
        elif(number == 5):
            print("V")
        elif(number == 6):
            print("VI")
        elif(number == 7):
```

```
        print("VII")
    elif(number == 8):
        print("VIII")
    elif(number == 9):
        print("IX")
    elif(number == 10):
        print("X")
    else:
        print("Out of range: ")
```

```
Enter a number between 1 and 10 (inclusive): 3
III
```

5 Mass and Weight

```
In [5]: mass = float(input("Enter the object's mass: "))
        weight = mass*9.8;
        if(weight >= 500):
            print("The object is too heavy.")
        if(weight <= 100):
            print("The object is too light. ")
```

```
Enter the object's mass: 4
The object is too light.
```

6 Magic Dates

```
In [6]: month = int(input("Enter a month (numeric): "))
        day = int(input("Enter a day"));
        year2 = int(input("Enter a two digit year"))
        if(month*day == year2):
            print("The date is magic ")
        else:
            print("The date is not magic ")
```

```
Enter a month (numeric): 4
Enter a day4
Enter a two digit year4
The date is not magic
```

7 Color Mixer

```
In [16]: colorPrimary1 = input("Enter name of first primary color: ")
         colorPrimary2 = input("Enter name of second primary color: ")
```

```python
        if(colorPrimary1 == 'red' and colorPrimary2 == 'blue' or
           colorPrimary1 == 'blue' and colorPrimary2 == 'red'):
            print("When you mix " + colorPrimary1 + " and " +
                  colorPrimary2 + ", you get purple")
        elif(colorPrimary1 == 'red' and colorPrimary2 == 'yellow' or
             colorPrimary1 == 'yellow' and colorPrimary2 == 'red'):
            print("When you mix " + colorPrimary1 + " and " + colorPrimary2 +
                  ", you get orange")
        elif(colorPrimary1 == 'blue' and colorPrimary2 == 'yellow' or
             colorPrimary1 == 'yellow' and colorPrimary2 == 'blue'):
            print("When you mix " + colorPrimary1 + " and " + colorPrimary2 +
                  ", you get green")
        else:
            print("Error, secondary color not found")
```

```
Enter name of first primary color: 34
Enter name of second primary color: 43
Error, secondary color not found
```

8   Hotdog Cookout Calculator

```python
In [8]: people = int(input("Enter number of people attending: "))
        hotDogs = 10;
        hotDogBuns = 8;
        minHotDogs = (int)(people/10)
        print("Minimum number of packages of hot dogs:", minHotDogs)
        minHotDogBuns = (int)(people/8)
        print("Minimum number of packages of hot dog buns:",minHotDogBuns)
        leftHotDogs = people - minHotDogs*hotDogs
        print("Number of hot dogs left:",leftHotDogs)
        leftHotDogBuns = people - minHotDogBuns*hotDogBuns;
        print("Number of hot dog buns left:", leftHotDogBuns)
```

```
Enter number of people attending: 34
Minimum number of packages of hot dogs: 3
Minimum number of packages of hot dog buns: 4
Number of hot dogs left: 4
Number of hot dog buns left: 2
```

9   Roulette Wheel Colors

```python
In [9]: pocketNum = int(input("Enter a pocket number: "))
        if(pocketNum == 0):
            print("Pocket 0 is green ")
```

4

```python
    elif(pocketNum >= 1 and pocketNum <= 10):
        if(pocketNum%2 != 0):
            print("Pocket {} is red".format(pocketNum))
        if(pocketNum%2 == 0):
            print("Pocket {} is black".format(pocketNum))
    elif(pocketNum >= 11 and pocketNum >= 18):
        if(pocketNum%2 != 0):
            print("Pocket {} is black".format(pocketNum))
        if(pocketNum%2 == 0):
            print("Pocket {} is red".format(pocketNum))
    elif(pocketNum >= 19 and pocketNum >= 28):
        if(pocketNum%2 != 0):
            print("Pocket {} is red".format(pocketNum))
        if(pocketNum%2 == 0):
            print("Pocket {} is black".format(pocketNum))
    elif(pocketNum >= 29 and pocketNum >= 36):
        if(pocketNum%2 != 0):
            print("Pocket {} is black".format(pocketNum))
        if(pocketNum%2 == 0):
            print("Pocket {} is red".format(pocketNum))
    else:
        print("Out of range")

Enter a pocket number: 43
Pocket 43 is black
```

10   Money Counting Game

```python
In [10]: pennies = int(input("Enter number of pennies: "))
         nickles = int(input("Enter number of nickles: "))
         dimes = int(input("Enter number of dimes: "))
         quarters = int(input("Enter number of quarters: "))
         money = pennies*1 + nickles*5 + dimes*10 + quarters*25
         if(money == 100):
             print("One Dollar! ")
         elif(money > 100):
             print("More than one dollar")
         elif(money < 100):
             print("Less than a dollar")
         else:
             print("An error has occurred! ")

Enter number of pennies: 34
Enter number of nickles: 34
Enter number of dimes: 43
Enter number of quarters: 43
```

More than one dollar

11   Book Club Points

```
In [11]: purchaseAmount = int(input("Enter the number of books purchased this month: "))
         if(purchaseAmount == 0):
             print("0 points awarded.")
         elif(purchaseAmount == 2):
             print("5 points awarded")
         elif(purchaseAmount == 4):
             print("15 points awarded")
         elif(purchaseAmount == 6):
             print("30 points awarded")
         elif(purchaseAmount >= 8):
             print("60 points awarded")
         else:
             print("Unknown points awarded")

Enter the number of books purchased this month: 43
60 points awarded
```

12   Software Sales

```
In [12]: quantity = int(input("Enter the number of packages purchased."))
         price = 99;
         if(quantity >= 10 and quantity <= 19 ):
             discount = price*.10;
             total = price - discount
             print("Discount is {} and total price is {}".format(discount,total))
         elif(quantity >= 20 and quantity <=49):
             discount = price*.20;
             total = price - discount
             print("Discount is {} and total price is {}".format(discount,total))
         elif(quantity >= 50 and quantity <=99):
             discount = price*.30;
             total = price - discount
             print("Discount is {} and total price is {}".format(discount,total))
         elif(quantity >= 100):
             discount = price*.40;
             total = price - discount
             print("Discount is {} and total price is {}".format(discount,total))
         else:
             print("No discount")

Enter the number of packages purchased.34
```

```
Discount is 19.8 and total price is 79.2
```

13 Shipping Charges

```python
In [13]: wPackage = int(input("Enter the weight of a package: "))
         if(wPackage <= 2):
             charge = wPackage*1.50
             print("Shipping charge is ${}".format(charge))
         elif(wPackage > 2 and wPackage <= 6):
             charge = wPackage*3.00
             print("Shipping charge is ${}".format(charge))
         elif(wPackage > 6 and wPackage <= 10):
             charge = wPackage*4.00
             print("Shipping charge is ${}".format(charge))
         elif(wPackage > 10):
             charge = wPackage*4.75
             print("Shipping charge is ${}".format(charge))

Enter the weight of a package: 34
Shipping charge is $161.5
```

14 Body Mass Index

```python
In [14]: weight = int(input("Enter weight in pounds: "))
         height = int(input("Enter height in inches: "))
         bmi = weight*703/(height*height)
         if(bmi >= 18.5 and bmi <= 25):
             print("Optimal")
         elif(bmi < 18.5):
             print("Underweight")
         elif(bmi > 25):
             print("Overweight")

Enter weight in pounds: 432
Enter height in inches: 43
Overweight
```

15 Time Calculator

```python
In [15]: seconds = int(input("Enter number of seconds: "))
         if(seconds >= 60):
             minutes = seconds/60;
             print("{} minutes".format(minutes))
         elif(seconds >= 3600):
```

```python
        hours = seconds/3600;
        print("{} hours".format(hours))
    if(seconds >= 86400):
        days = seconds/86400;
        print("{}".format(days))
```

Enter number of seconds: 324
5.4 minutes