# Models and Simulations: Problem Set 2

**Exercise 1:** Working with If-Statements

Write a program that determines the season in which a used was born. To do so, create a "Chooser" in the interface and call the global variable Month. Under choices, enter "January", "February", etc. Put quotation marks around each of the choices and make sure each choice is separated by a line. Next, create an input called Day, and choose "Number" for the type. Using if and ifelse statements, determine whether the user was born in winter, spring, summer, or fall. For example, if the user enters "February" for Month, then regardless of what she enters for Day, then the program ought to print, "You were born in winter." For your reference, the dates of the seasons are as follows:

- Winter: 21/12 - 21/3
- Spring: 22/3 - 20/6
- Summer: 21/6 - 22/9
- Autumn: 23/9 - 20/12

**Exercise 2:** Working with Loops

1. The **Fibonacci numbers** are a sequence of positive whole numbers such that each number is the sum of the previous two in the sequence. The first seven Fibonacci numbers are $1, 1, 2, 3, 5, 8$ and 13. Create an input button that takes a number n as input, and write a program that prints the first n Fibonacci numbers. Use a repeat loop. For example, if a user enters 20 as input, your program should produce the following output:

   **Output:**
   *[1 1 2 3 5 8 13 21 34 55 89 144 233 377 610 987 1597 2584 4181 6765]*

2. Using a while loop, write a program that rolls two fair dice until the sum of the faces rolled is seven. Your program ought to print (a) each

of the rolls of the dice, and (b) how many times the dice were rolled before the sum of the faces rolled was seven. That is, the output of your program ought to look like the following:

**Output:**
*Roll 1: You rolled a 1 and 5.*
*Roll 2: You rolled a 3 and 2.*
*Roll 3: You rolled a 5 and 2.*
*You rolled the dice three times before the sum of the two faces was equal to seven.*

**Exercise 3:** Combining If-statements with Loops

Write a program that flips a fair coin until three consecutive heads are observed. Your program ought to print the series of coin flips and the number of total flips before three consecutive heads were observed.

**Output:** *000010011010110111*
*The number of total tosses was 18.*