Work through the following sections. Seek assistance whenever needed. From http://schmidt.nuigalway.ie/cs102/python files with Python programs can be downloaded. Present your results to one of the demonstrators, so that a record of your achievements can be kept.

19. True or False?

1. A simple decision can be implemented with an `if` statement.
2. In Python conditions, $\neq$ is written as `/=`.
3. Strings are compared by lexicographic ordering.
4. A two-way decision is implemented using an `if-elif` statement.
5. The `math.sqrt` function canot be applied to negative numbers.
6. A single `try` statement can catch multiple kinds of errors.
7. Multi-way decisions must be handled by nesting multiple `if-else` statements.
8. There is usually only one correct way to implement a problem involving decision structures.
9. The condition `x <= y <= z` is allowed in Python.

20. Multiple Choice.

1. A statement that controls the execution of other statements is called a
   (a) boss structure
   (b) super structure
   (c) control structure
   (d) branch
2. The best structure for implementing a multi-way decision in Python is
   a) `if` b) `if-else` c) `if-elif-else` d) `try-except`
3. An expression that evaluates to either true or false is called
   a) operational b) Boolean c) simple d) compound
4. Placing a decision inside another decision is an example of
   a) cloning b) spooning c) nesting d) procrastination
5. The literals for the Boolean data type are
   a) `T`, `F` b) `True`, `False` c) `true`, `false` d) `1`, `0`
6. In Python, the body of a decision is indicated by
   a) indentation b) parentheses c) curly braces d) a colon
7. A multiple choice question is most similar to
   (a) simple decision
   (b) two-way decision
   (c) multi-way decision
   (d) an exception handler

21. Programming Exercises.

1. A 5-point quiz is graded on the scale 5:A, 4:B, 3:C, 2:D, 0 or 1:F. Write a program that accepts a quiz score as input and uses a decision structure to calculate the corresponding grade.
2. A 100-point exam is graded on the scale 90-100:A, 80-89:B, 70-79:C, 60-69:D, less than 60:F. Write a program that accepts an exam score as input and uses a decision structure to calculate the corresponding grade.
3. The *body mass index (BMI)* is calculated as a person's weight (in pounds) times 703, divided by the square of the person's height (in inches). A BMI in the range 19–25, inclusive, is considered healthy. Write a program that calculates a person's BMI and prints a message telling whether they are above, within, or below the healthy range.
4. A year is a *leap year* if it is divisible by 4, unless it is a century year that is not divisible by 400. (1800 and 1900 are not leap years while 1600 and 2000 are.) Write a function that calculates whether a year is a leap year.
5. Write a program that accepts a date in the form day/month/year and outputs whether or not the date is valid. (31/09/2007 is not valid because September has only 30 days. 29/02/2007 is not valid because 2007 is not a leap year.)
6. The days of the year are often numbered from 1 to 365 (or 366). This number can be computed in three steps, using `int` arithmetic:
   (a) `number = 31 * (month - 1) + day`
   (b) if the month is after February subtract `(4 * month + 23)/10`
   (c) if it's a leap year and after February 29, add 1.

   Write a program that accepts a date as day/month/year, verifies that it is a valid date, and then calculates the corresponding day number. (For example, November 13 is day number 317 in 2007.)
7. A formula for computing the date of Easter in the years 1982–2048, inclusive, is as follows:
   - `a = year % 19`
   - `b = year % 4`
   - `c = year % 7`
   - `d = (19 * a + 24) % 30`
   - `e = (2 * b + 4 * c + 6 * d + 5) % 7`

   The date of Easter is March `22 + d + e` (which could be in April). Write a program that inputs a year, verifies that it is in the proper range, and the prints out the date of Easter in that year.
8. The formula in the previous program works for every year in the range 1900–2099 except for 1954, 1981, 2049, and 2076. for these 4 years it produces a date that is one week too late. Modify the above program to work for the entire range 1900-2099.