Exercises for Week 2

2A. (If-statements)

Write if-statements to do the following:

- (a) Print 'male' or 'female', given a boolean gender (where False represents female and True represents male).
- (b) Update x to contain the value of y, but only if the value of x is less than the value of y.
- (c) Print the name of the season, given an integer season (where 0 represents Spring, 1 represents Summer, 2 represents Autumn, and 3 represents Winter).

2B. (Evaluating conditional and short-circuit expressions)

Assume that m contains 8 and n contains 2. Evaluate the following expressions:

```
(a) +1 if n > m else -1
```

```
(b) +1 if n > m else (-1 if n < m else ()
```

```
(c) n == 0 \text{ or } m/n < 3
```

Now assume that both m and n contain 0. Re-evaluate the expressions (a)–(c).

2C. (*Conditional and short-circuit expressions*)

Write expressions to do the following:

- (a) Yield the lesser of the values contained in x and y.
- (b) Yield True iff the logarithm of x to the base 10 is less than y. (Assume that the function log(x, b) returns the logarithm of x to the base b, provided that x is positive.)
- **2D.** (*Executing while-statements*)

Trace the following while-statements:

```
(a) m = 2
n = 0
while n <= 10:
    print n
n = n+m
(b) m = 37
n = 11
while m > n:
    m = m - n
```

In a single sentence, explain what each while-statement does in general.

2E. (*While-statements*)

Use while-statements to implement the following:

- (a) Compute π using the series:
 - $\pi = 4/1 4/3 + 4/5 4/7 + 4/9 \dots$

Terminate when you reach a term less than 0.0001.

- (b) power(x, n) returns x to the power n, where n is a non-negative integer. Do *not* use the "**" operator.
- (c) replicate(s, m) returns a string in which s is replicated as many times as possible without exceeding the maximum length m. E.g., replicate('abc', 8) should return 'abcabc'.