These practice problems correspond roughly to the material covered in the second week of classes (1-28 to 2-1) and to the assigned readings.

1. Here is a program we discussed on converting a nonnegative integer to its equivalent binary representation. This is posted as `intToBinary2.py` on the course page.

   ```python
   n = int(raw_input("Type a nonnegative integer. "))
   suffix = ""
   while n > 0:
       suffix = str(n % 2) + suffix
       n = n/2
   print suffix
   ```

   (a) What output do you get when you change Line 4 to
   ```python
   suffix = suffix + str(n % 2)
   ```
   and run the program with input 35? Is the output the binary equivalent of 35? Explain in two sentences what this change is causing the program to do.

   (b) Change Line 4 to
   ```python
   suffix = n % 2 + suffix
   ```
   and execute the program. What happens? Explain in one sentence why your program behaves in this manner.

2. Write a Python program that reads as input a positive integer and produces as output the reverse of the input integer. For example,

<table>
<thead>
<tr>
<th>Input</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>73</td>
<td>37</td>
</tr>
<tr>
<td>1024</td>
<td>4201</td>
</tr>
<tr>
<td>100</td>
<td>001</td>
</tr>
</tbody>
</table>

   Your program should be very similar to `intToBinary2.py`. The basic idea of this program is to extract the decimal digits of the input, one digit at a time, and then put them together in reverse order.
3. For each of these programs, write down what the output will be.

(a) n = 10
    if n % 3 != 0:
        print "Line 1", n
        print "Line 2", n
    else:
        print "Line 3", n

(b) n = 11
    if n < 2:
        n = n + 1
        print "Line 1", n
    else:
        print "Line 2", n
        print "Line 3", n

(c) n = 11
    if n < 11:
        n = n + 1
        print "Line 1", n
    else:
        n = n + 10
        print "Line 2", n
        print "Line 3", n

4. Write a program that prompts the user for a sequence of positive integers and then outputs the number of even integers and the number of odd integers input by the user. The user will input 0 to indicate that she is finished inputting her sequence of positive integers. The 0 is not considered part of the sequence that your program needs to process here is an example interaction between the user and the program:

Enter a number: 7
Enter a number: 9
Enter a number: 90
Enter a number: 3
Enter a number: 0
Even numbers: 1, Odd numbers: 3

5. Write down the output produced by the following program:

n = 10
while n < 13:
    if n % 3 == 0:
        print "Line 1"
    else:
        print "Line 2"
    n = n + 1
6. For each expression below, specify its type and value. For expression (6), suppose that the user types `10 + 20` in response to the prompt. For expression (16), suppose that the user types `20` in response to the prompt.

<table>
<thead>
<tr>
<th>Expression</th>
<th>Type</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>17/2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17/2.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>float(17/2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>str(17/2.0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&quot;hello&quot; + &quot;100&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>raw_input(&quot;number?&quot;)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&quot;100&quot; == 100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>float(1) + 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>int(&quot;337&quot;)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>171/5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>171%5 != 0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>170/(2*5.0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>float(17/2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17/2 &lt; 17.0/2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&quot;17/2&quot; != &quot;17 /2&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&quot;0 + &quot; + raw_input(&quot;number?&quot;)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>float(1) + 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>float(&quot;300.&quot; + &quot;100&quot;)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>float(&quot;hello&quot; != &quot;hi&quot;)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>float(str(5%2) + str(5/2))</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
7. Write down the output produced by the following program:

```python
n = 10
m = 15
while m >= n:
    if (m + n) % 5 == 0:
        print "Line 1", n, m
        m = m - 1
    else:
        print "Line 2", n, m
        n = n + 1
        m = m - 1
```