Python Worksheet III

Part I - Conversions

1) So far we've learnt about four data types. What are they? Give an example of each.
2) We've also learnt about four operators: **+**, **-**, ***** and **/**. Which of the following are **valid operations**, that is, ***won't*** give us an error. Type them into python to check your answers.
    a) `2 * 3`
    b) `72.1 / "8"`
    c) `"10" + 2`
    d) `"I have " + 3 + " apples"`
    e) `"To infinity, " + "and" + " beyond!"`
    f) `"bouncy, " * 5`
3) For the operations in question 2 that didn't work, use a conversion function to convert one of the variables to what it should be. Remember:

    `str()` - converts something to a **string**
    `int()` - converts something to an **integer**
    `float()` - converts something to a **float**

4) The `input()` command gives us back what you type in. What type is the data? Hint: you can use the `type()` command.
5) Write a program that asks the user to input a number, multiplies it by ten and then tells us the answer. *Hint: you will need to convert the input to a number.*
6) Write a program that takes a number between zero and ten, and then outputs that number as a word. The output should look something like this:

```
Choose a number between 0 and 10: 7
You chose seven!
```

Hint: you will need to use a list!

Part II - loops

1) Write a loop that prints out all the numbers between 0 and 20.
2) Write a program that asks the user for a number between 0 and 10. Then have the program print out all the numbers between 0 and the number they chose.
3) Write a program that asks the user for a number between 0 and 10. Then have the program print out all the numbers between the negative number they chose, and the positive of the number. For example if they chose 3, the output would be:

```
Choose a number between 0 and 10: 3
-3
-2
-1
0
1
2
3
```

4) Modify the last program to say for each number if it is positive or negative. For example, if the user chose 3, the output would be:

```
Choose a number between 0 and 10: 3
-3 is negative
-2 is negative
-1 is negative
0 is positive
1 is positive
2 is positive
3 is positive
```

5) Write a program that asks the user for a number between 0 and 20. Then have the program print out all the ***even*** numbers between 0 and the number they chose. The output should look something like this:

```
Choose a number between 0 and 20: 13
The even numbers between 0 and 13 are:
0
2
4
6
8
10
12
```

6) Write a program that asks the user for a number between 0 and 20. Then have the program print out all the ***odd*** numbers between 0 and the number they chose.
7) Write a program that asks the user for 2 numbers, one small and one larger. Then have the program print out all the numbers between those two numbers.

Part III - loops and lists

1) Write a program that asks the user to add 5 items to a shopping list. Then have the program print out all the items they added to the list. There may be more than one way to do this. It's up to you how you write the program.
2) Save your shopping list as a separate file. Modify this new program to first ask the user how many items they wish to add to the list. Have the user add this number of items to the shopping list and then print the final list.

Part IV - drawing with loops

1) Write a program which draws a square using a loop.
2) Write a program which draws a 6 pointed star. Use a loop.
3) What other cool shapes can you make with loops? Experiment, and if you find something you want to share with the class, save the file and send it to hello@codingkids.com.au and we can have a look next week.
4) ***Advanced!*** Write a program which asks the user to input a number greater than 3. Have the program then draw a shape with as many sides as that number. For instance, if the user entered 5, the program would draw a pentagon.