Activities Module 7: Python Functions

1. Import the math module and calculate the value of $\sin(x)^2 + \cos(x)^2$ for `x = math.pi`. (This is a joke, but do you get it?)

2. Import the math module in order to make a primitive table of the values of the sine and exponential of the number 0, 0.1, 0,2, … 1.8, 1.9, 2.0. You can use a for loop to generate the arguments as multiples of 0.1.

3. Write a function that calculates and returns the value $\frac{|x+y|}{x^2+y^2+1}$. The function needs to return a value, not print it. (Printing and returning are two very different things, unfortunately, right now they appear to do almost the same thing. Then check your function against mine: $f(-2,3) = \frac{1}{14}, f(-1,3) = \frac{2}{11}, f(0,1) = \frac{1}{2}$

4. Write a function that prints *n asterisks*, then m spaces, then *n* asterisks. This function could have a return statement or not.

5. Write a function that given *x* returns the value *n* such that the *n*th harmonic number is just above *x*. (Of course, you are to use the code from the previous module.

6. Write a function that prints out a rhombus of 2*n*-1 lines as on the right.

```
    *
   ***
  *****
 *******
*********
***********
*********
 *******
  *****
   ***
    *
```

7. Write a function `get_user_consent( )`. This function asks the user for consent. If the user enters “yes”, “aye”, “Yes”, “Yupp” or any other word that starts with “y”, then the function returns `True`. You check whether the first letter of a word is “y” by the following if-statement:

```
if word[0] == 'y':
   DoSomething
```

   Otherwise, the function will return “False”.