New York University
School of Continuing and Professional Studies
Division of Programs in Information Technology

Introduction to Python
Homework, Session 1

1.1   Exponientation with tidy border: start with the following code, which takes input from the user twice:

```
var_1 = input('Please enter an integer:  ')
var_2 = input('Please enter another integer:  ')
```

Raise the first number to the power of the second number (you will have to convert them to numbers to do the math). Take the resulting number and determine its string length with len() (you will have to convert it to a string to get its string length). Print a line with a ======== border exactly the length of the resulting number (use the * operator to repeat the string '='). On the next line, print the number. Then on a third line print a ======== border the same length as the first.

Sample program run(s):

```
$ python myprog.py
please enter an integer:  3
please enter another integer:  14
=======
4782969
=======

$ python myprog.py
please enter an integer:  3
please enter another integer:  5
===
243
===
```

1.2   Tip calculator: write a restaurant bill calculator that takes three inputs: a restaurant bill total charge, the number of people who will be splitting the bill, and the desired tip in percent of the total bill.

Expected Output:

```
Please enter the total bill amount:  120
Please enter the number in your party:  5
Please enter the desired tip percentage (for example, "20" for 20%):  15
A 15.0% tip ($18.0) was added to the bill, for a total of $138.0
With 5 in your party, each person must pay $27.6
```

SUPPLEMENTARY (EXTRA CREDIT) EXERCISES

These assignments are intended to give you additional practice if you have the time and inclination. I will look at any submissions from this section, although I may not have as much time to offer detailed inline comments as I do with the required assignments.

1.3   (extra credit) Price Per Unit Comparison: write a program that takes four inputs: the price of a product, the unit size of that product (for example, "5" for five ounces, or "2.5" for 2.5 litres), the price of a second product, and the unit size of that product (using the same units). The program will then calculate the price per unit of each product and show which product is the better value on that basis.

Sample program run(s):

```
please enter the unit size of Product 1:   100
please enter the price of Product 1:   10
please enter the unit size of Product 2:   50
please enter the price of Product 2:   7.50
Product 1 costs $0.1 per unit
Product 2 costs $0.15 per unit
Product 1 is 66.67% the per-unit cost of Product 2
```

1.4   (extra credit) Share Calculator: this program is just a practical demonstration of how easily Python can pull in data from the web for use in your programs. It will only work if your computer is connected to the internet (and there are no firewall or other systems in place that might prevent a network connection from your computer).

Calculate the number of shares of a given stock a given amount of money can buy. Take user input for a stock symbol (for example, "AAPL" (Apple Inc.), "GOOG" (Google Inc.), "DOW" (Dow Chemical Co.) and a cash dollar amount, and calculate how many shares could be bought for the cash.

The program uses a pre-written function (get_ticker(), supplied below) to retrieve the stock's current price from the internet to use in the calculation.

Starter Code:

```
def get_price(symbol):
    import urllib.request, urllib.parse, urllib.error
    import json

    base_url = "http://finance.google.com/finance/info?client=ig&q={}:{}"
    try:
        content = urllib.request.urlopen(base_url.format('NASDAQ', symbol)).read()
    except IOError:
        exit('Error:  cannot connect')

    content_json = content.decode('utf-8')

    try:
        obj = json.loads(content_json[3:])
    except ValueError:
        exit('Error:  stock symbol ' + symbol + ' not found')

    current_price = obj[0]['l'].replace(',', '')

    return float(current_price)

aa = input('please input the stock symbol you would like to buy:  ')
bb = input('please input the cash you have to invest:  ')

cc = get_price(aa)       # returns a float price

## your code goes here — calculate the # of shares
## that can be bought with the user's cash
```

Sample program run(s):

```
please input the stock symbol you would like to buy:  UNP
please input the cash you have to invest:  10000
with $10000 you can buy 90 shares of UNP at $110.62/share
```