New York University
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Introduction to Python
Homework Discussion, Session 1

1.1   Exponientation and tidy border. So, a lot of steps here and you may not know where to begin. First, understand that this assignment is all about type conversion. Basically, a string can't be used in math expression (like the exponientation calculation done with **) but an integer can, and you can convert a string to int with int(). You can't get the length of a number with len() (which is needed if you're going to calculate the length of a "tidy border", but you can get the length of a string, and you can convert a number to a string with str().

If you're not sure where to begin, you can try to follow this train of thought: start with the values you'll be getting from input(). What type of object is returned from input()? Go ahead and write a program that takes the two values required, and then verify the type of each of the values that are returned from input(). (Remember, you can check the type of any variable either by printing it directly, or by using type(). You can also check the Executive Summary (when it becomes available). If you want to run a ** calculation with these values as operands, how must they be converted, and which function does that? Once the exponientation calculation is accomplished, what type of object comes back from **? If you want to create a custom-length border, you'll want to use the * operator to repeat the '=' character a certain number of times. The length of the border will be based on the length of the exponientation result, but you can't get a len() of an integer, so what type of value is required? How can the exponientation result be converted?

Pseudocode:

```
take user input value 1
take user input value 2

convert user input value 1 to an int
convert user input value 2 to an int

raise the 1st int to the power of the 2nd int (exponientation)

convert the exponientation result to a str
get the len of the str

repeat the border character ('=') by the len of the str, and print the result
print the exponientation value
print the custom border again (as above)
```

1.2   Tip calculator. This is a (relatively) simple calculation. Ignoring tax, the calculation is:

```
(bill + (bill * (tip_multiplier*.01))) / num_guests
```

However, keep in mind that you don't need to calculate the entire thing in one line using the formula above. You can (and probably should) break them out into separate calculations, assigning each result to a variable which you will then use in a further calculation.

The values for bill, tip_multiplier and num_guests are all input through input(). Since we're doing math calcuations with these values, they all have to be converted to numeric types (int and float).

So your program will take user input, convert to numeric types, convert the tip multipler value to a percentage multipler so it can be used in the formula above, and then report the result of the calculation.

Pseudocode:

```
take user input for value 1 (bill amount)
take user input for value 2 (number of people in your party)
take user input for value 3 (tip percentage, expressed as an integer)

convert the bill amount from string to a float
convert the number of people in your party to an int
convert the tip percentage to a float

multiply the tip percentage value by 0.01 so it can be used as a multipler
(for example, if the user inputs 20 it should be converted to .2 so it can be
used to calculate the tip)

calculate the tip amount by multiplying the bill amount by the tip multiplier

sum up the total bill by adding the bill amount to the tip amount

divide the total bill by the number of guests to produce the "bill share".

Round the "bill share" to 2 decimal places to ensure that it's a dollars-and-cents value.

Use the str() function and the + concatenation operator to connect the numeric
values with strings explaining the calculated result.
```