Programming Using Numbers (part 2)

CMSC 104 Section 2
September 18, 2025

Administrative Notes

- Should have the sample quiz out
- Project 1
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Importing and using the Math library

The first part of this lecture involves loading and using Python libraries

Then we'll cover Boolean variables, which you need in Classwork 3

Python libraries

There are literally thousands of Python libraries available for free use

- This is code that others have written, and made available for free
- See e.g. https://pypi.org
- Some libraries come standard with your Python download; you just have to import them into your program.
  - Others have to be retrieved from sites like pypi.org before you can import them
- One of these is the math library. See https://docs.python.org/3/library/math.html for details

Importing libraries

The easiest way to import a library is:

```
import math
```

This line will *usually* be at or near the type of your Python code. If you try to use code from a library before you import the library, your program will crash. So you put the import line near the top, to prevent that type of mistake.

“math” is a pretty short name. But some libraries have longer names, and you might want to use a shorter nickname for it. You do that like this:

```
import math as m
```

Now instead of using “math.sqrt” you can just say “m.sqrt.”

Using functions from the math library

After you've imported the library, you can use any function in it. You'll use square root (math.sqrt()) in Classwork 3. You'll use cube root (math.cbrt()) in Project 1.

```
import math
num = int(input("Please enter a positive integer: "))
print("The square root of :", num, " is ", math.sqrt(num))
```

```
next_num = int(input("Please enter any integer:
"))
print("The cube root of ", next_num , " is equal
to ", math.cbrt(next_num))
```

Other functions

Print the value of pi:

```
print(math.pi)
```

Calculate e to a given power:

```
n = int(input("Please enter a number: "))

print(math.exp(n))
```

Nicknames

I said you can use a shorter name if you want:

```
import math as m
n = float(input("Please enter a number: "))
print(m.exp(n))
```

Boolean variables

Boolean variables are Python variables that have one of two possible values: True or False

The case is important - the first letter must be uppercase and the rest of the word must be lowercase.

- Any other combination is not the Boolean value; it’s a string. And that’s guaranteed to mess up your program.

Why are they important?

They let us control conditional action in the program.

We can do things if the value of a Boolean variable is True; and not if it’s False.