Python Basics

Math Functions in the `math` Module:

- `math.sqrt(x)`: Calculates the square root of `x`.
- `math.pow(x, y)`: Raises `x` to the power of `y`.
- `math.exp(x)`: Calculates the exponential value of `x` (e^x).
- `math.log(x)`: Calculates the natural logarithm of `x` (base e).
- `math.log10(x)`: Calculates the logarithm of `x` to base 10.
- `math.sin(x)`, `math.cos(x)`, `math.tan(x)`: Calculate the sine, cosine, and tangent of `x`, respectively (where `x` is in radians).
- `math.degrees(x)`: Converts `x` from radians to degrees.
- `math.radians(x)`: Converts `x` from degrees to radians.

Methods are functions that are available for a given object.

Variable and Methods

Variables:

A variable is a named storage location used to store data or values in a program. It acts as a placeholder for data that can be accessed, modified, or used in calculations throughout the program. Variables in Python are dynamically typed, meaning their data type can change during program execution. Here's an example of variable usage in Python:

```
# Variable assignment
x = 10
name = "John"
is_true = True


# Variable usage
y = x + 5
print("Hello, " + name)
if is_true:
    print("The condition is true")
```

In the example above, `x`, `name`, and `is_true` are variables assigned with different data types (integer, string, and boolean, respectively). They are used in calculations and print statements to perform operations and display values.

Methods:

A method is a block of reusable code that performs a specific task or action. Methods are associated with objects or classes and are called upon to perform certain operations. In Python, methods are commonly referred to as functions. Built-in functions and user-defined functions both fall under the category of methods. Here's an example:

```
# Built-in method example
numbers = [1, 2, 3, 4, 5]
length = len(numbers)
print("Length:", length)


# User-defined method example
def greet(name):
    print("Hello, " + name)


greet("Alice")
```

In the example above, `len()` is a built-in method that calculates the length of a list (`numbers` in this case). The user-defined method `greet()` takes a parameter `name` and prints a greeting message. It is called with the argument "Alice" to print "Hello, Alice" to the console.

Methods can have return values, perform actions, accept parameters, and more, depending on their purpose and design.

Variables and methods are essential components in Python programming. Variables store data, while methods encapsulate reusable blocks of code for specific tasks. Understanding their usage and relationship is crucial for building functional and efficient programs.

For more information regarding lesson learnings, consult the python files in kali created together with the lessons.