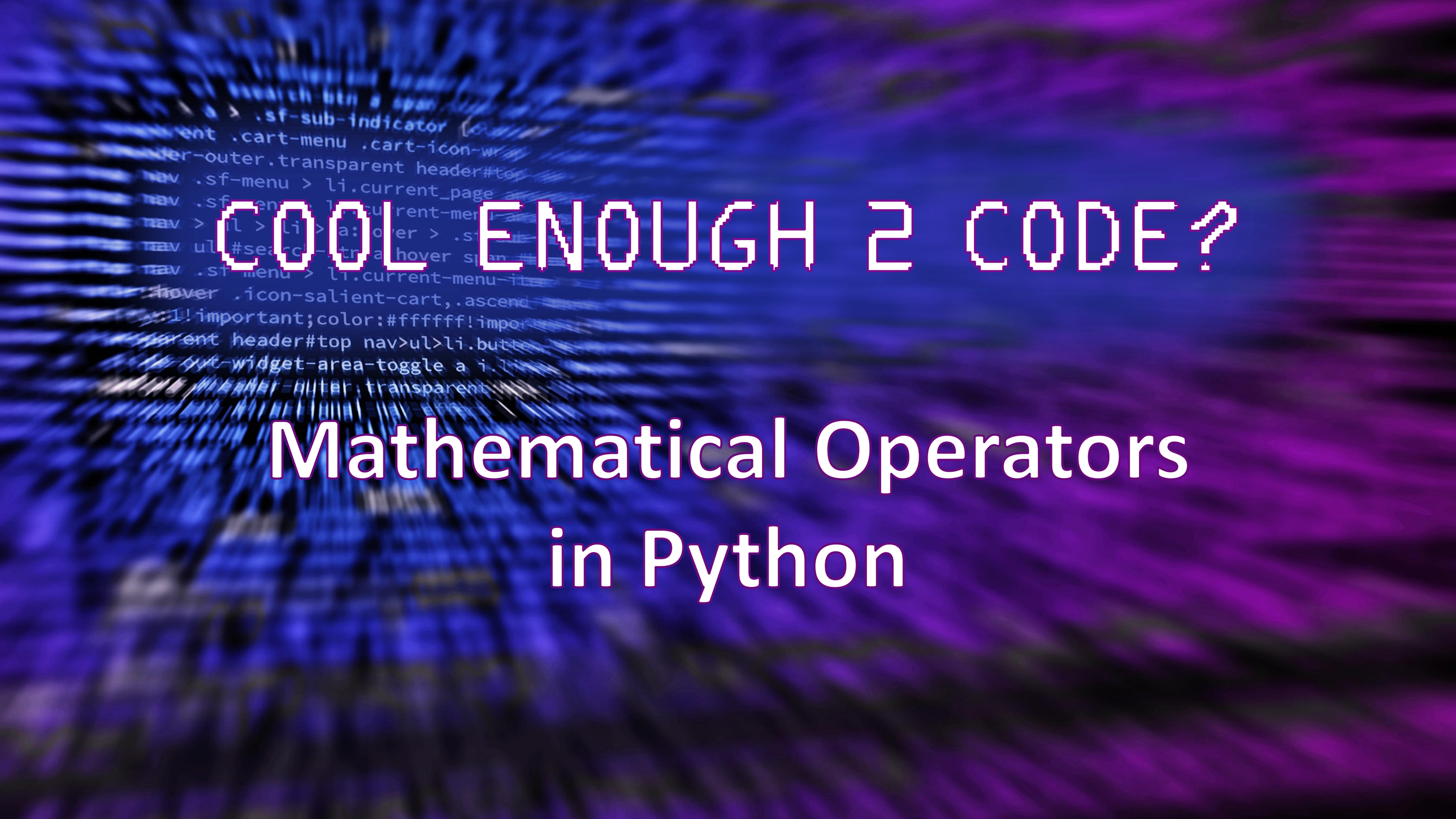
COOL ENOUGH 2 CODE?
Mathematical Operators
in Python

Data Types

- **Boolean** – `bool` – Either true or false
- **String** – `str` – Text data
- Numeric data
  - **Integer** – `int` – Numbers without decimals
  - **Float Point** – `float` – Numbers with decimals

Variables

- **Variables** can take on different values and store data in a computer's memory (RAM).
- Variables can be changed by the program.
- Variables can take on any data type, and with Python the data type with a variable can change too.
- Examples:

```
val1 = 1 # val1 is an integer variable
val2 = "blaize" # val2 is a string variable
```

Casting and Type

- **Casting** is converting one data type to another.
  - Sometimes, data is lost in the conversion.
  - Examples:

```
int(“1”) # casts a string to an integer
str(1.0) # casts a float to a string
```

- The **type()** function will tell you the data type of a variable.

Mathematical Operations

- Python supports common operations for basic arithmetic in the language:
  - Addition: `x = 1 + 2`
  - Subtraction: `x = 2 - 1`
  - Multiplication: `x = 2 * 2`

- Division has 3 cases:
  - Integer division: `x = 5//2 # returns 2`
  - Floating point division: `x = 5/2 # returns 2.5`
  - Modulus (ie. the “remainder”) : `x = 5%2 # returns 1`

Mathematical Operations

- Parenthesis can be used to evaluate a part of a calculation first.
- Examples:

```
x = (3+2) * (3+3)

x = (3 + 2 + (3-2)) * 2
```

Rounding Numbers

- The `round()` function allows you to round floating point numbers to a specific number of decimals.

```
x = round(2.5 * 2.51, 1)# returns 6.3
x = round(1.1 + 3.7, 1)# returns 4.8
```

Exponents Numbers

- Exponents are handled by using the ** operator.

```
x = 5 ** 2 # Returns 25
x = 9 ** .5 # Returns 3 (Square Root)
```

Numeric Input

- Numeric input can use the `input()` function, but needs a cast.

```
x = float(input("Enter a floating point number: "))
```

Challenge

Create a program to calculate the Drake Equation

- Prompt the user for each of the values and then cast them to the appropriate data type.
- Calculate the value of the equation and assign it to a variable.
- Print the value of the variable.

The Drake Equation

R = How many new stars form in our galaxy per year.
P = Fraction of stars with planet (0-1).
E = Planets per star that can support life.
L = Fraction of planets were life develops (0-1)
I = Fraction of planets with intelligent life? (0-1)
C = Fraction of planets that develop detectable signals (0-1)
T = How many years would civilization release these signals?

$$D = R \times P \times E \times L \times I \times C \times T$$