# FINE 434: FinTech

## Lecture 2

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# Overview

‣ String (str): A string of characters
(e.g. "a", "a dog", "This is a string", etc...)

‣ Integer (int): An integer
(e.g. ..., -1, 0, 1,...)

‣ Float (float): A number
(e.g. 0.0, 0.5, $\frac{2}{3}$, etc...)

‣ Boolean (bool): True or False

# Questions

**What are the data types for variables a, b, c, d, e and f?**

```
In [ ]: a = 5
        b = "5.0"
        c = "5"
        d = 5.0
        e = True
        f = "False"
```

# type(x)

type(x) reveals the type of x

```
In [1]:  x = 1
         type(x)

Out[1]:  int
```

# Answers

```
a = 5
b = "5.0"
c = "5"
d = 5.0
e = True
f = "False"
```

```
type(a)
```

```
int
```

```
type(b)
```

```
str
```

```
type(e)
```

```
bool
```

```
type(f)
```

```
str
```

# Your Turn

**What are the data types for variables c and d?**

```
In [ ]:  a = 5
         b = "5.0"
         c = "5"
         d = 5.0
         e = True
         f = "False"
```

# Type Casting

**Useful Functions**

- ‣ str(x) changes x to a string <u>if feasible</u>
- ‣ int(x) changes x to an integer <u>if feasible</u>
- ‣ float(x) changes x to a float <u>if feasible</u>
- ‣ bool(x) changes x to a boolean <u>if feasible</u>

**What does feasible mean??**

```
x = 5
```

```
type(x)
```

int

```
y = str(x)
y
```

'5'

```
type(y)
```

str

## Your Turn

Create a string defined as "dog" (e.g. x = "dog")

# Your Turn

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Convert the string to an integer (e.g. y = int(x))

What happens?

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Convert the string to an integer (e.g. y = int(x))

What happens?

How do we resolve the issue?

(This is not a coding question!)

# Operators

- \+ : Addition
  (e.g. $4 + 2 = 6$)
- \- : Subtraction
  (e.g. $4 - 2 = 2$)
- \* : Multiplication
  (e.g. $4*2 = 8$)
- / : Division
  (e.g. $4/2 = 2$)
- \*\* : Power
  (e.g $4**2 = 16$)
- % : Modulus
  (e.g. $4\%2 = 0$)

# Your Turn

- What is $12^5$? (i.e. 12**5 = ?)

- What is 123 modulus 21? (i.e. 123 % 21 = ?)

# Substrings

A string is... a string of characters.

How do we access each character?

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If x is a string then **x[n]** gives x's (n+1)th character

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Let's practice...

# Example

```
1   example = "this is an example"
```

```
1   example[0]
```

't'

```
1   example[1]
```

'h'

```
1   example[2]
```

'i'

# Your Turn

example = "this is an example"

example[4] = ?

example[18] = ?

example[-1] = ?

# len(x)

len(x) reveals the length of string x

```
1  example = "this is an example"
```

```
1  len(example)
```

18

# len(x)

len(x) reveals the length of string x

```
1   example = "this is an example"
```

```
1   len(example)
```

18

Use len(x) to stay in bounds...

# More Substrings

x[a:b] gives the (a+1)th to bth character's of x in one string

x[a:b:c] gives every cth character of x[a:b] starting with x[a:b]'s first character (if c > 0)

```
1  example = "new example"
```

```
1  example[4:8]
```
'exam'

```
1  example[4:8:2]
```
'ea'

```
1  subexample = example[4:8]
2  length = len(subexample)
3  subexample[0:length:2]
```
'ea'

## Your Turn

example = "new example"

example[4:8:-1] = ?

example[8:4:-1] = ?

## String Concatenation

firstpart = "Here is one sentence"
secondpart = "here is another."


firstpart + ";" + secondpart = ?


firstpart + "; It takes " + 12 + " seconds to read." = ?

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What went wrong?