

VARIABLES AND DATA TYPES

SHARP SIGHT

WHAT YOU'LL LEARN

- What is a variable?
- What is a data type?
- 7 core data types
- How to assign values to a variable
- Rules for variable names

VARIABLE BASICS

IN PROGRAMS, WE NEED TO STORE DATA AND WORK WITH DATA

For example, we need to store things like ...

Numeric data:

42

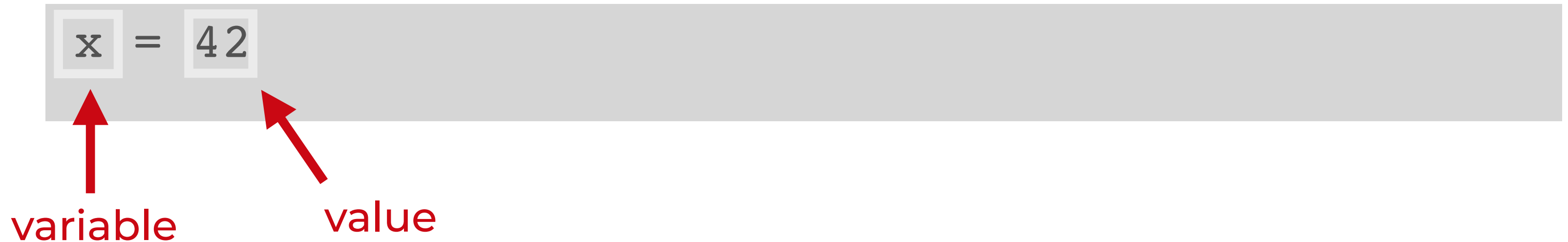
Character data:

AKA "string data"

This is character data

VARIABLES STORE INFORMATION

- Variables provide 'names' for the information that we store
- Example:



YOU ASSIGN VALUES TO VARIABLES WITH THE EQUAL SIGN

The equal sign enables you to store values in a variable

```
x = 42
```

```
print(x)
```

```
42
```

So when we examine `x`, we can see that it contains the value that we assigned.

YOU CAN RE-USE VARIABLE NAMES

- Assign a value to a variable using the equal sign
- Then assign a new value to a variable
 - use the equal sign again with a new value

Notice that we re-used `x` to store a different number



```
x = 42  
print(x)  
42
```

```
x = 11  
print(x)  
11
```

VARIABLE NAMING

VARIABLE NAMES CAN ONLY BEGIN WITH CERTAIN CHARACTERS

- Names *can* begin with
 - characters
 - underscores
- Names *can not* begin with:
 - digits

YOU CAN ONLY USE CERTAIN CHARACTERS IN VARIABLE NAMES

Allowed characters in variable names

character type	example
uppercase letters	A ... Z
lowercase letters	a ... z
digits	0 ... 9
underscore	—

DATA TYPES

THE VALUES WE STORE HAVE A *DATA TYPE*

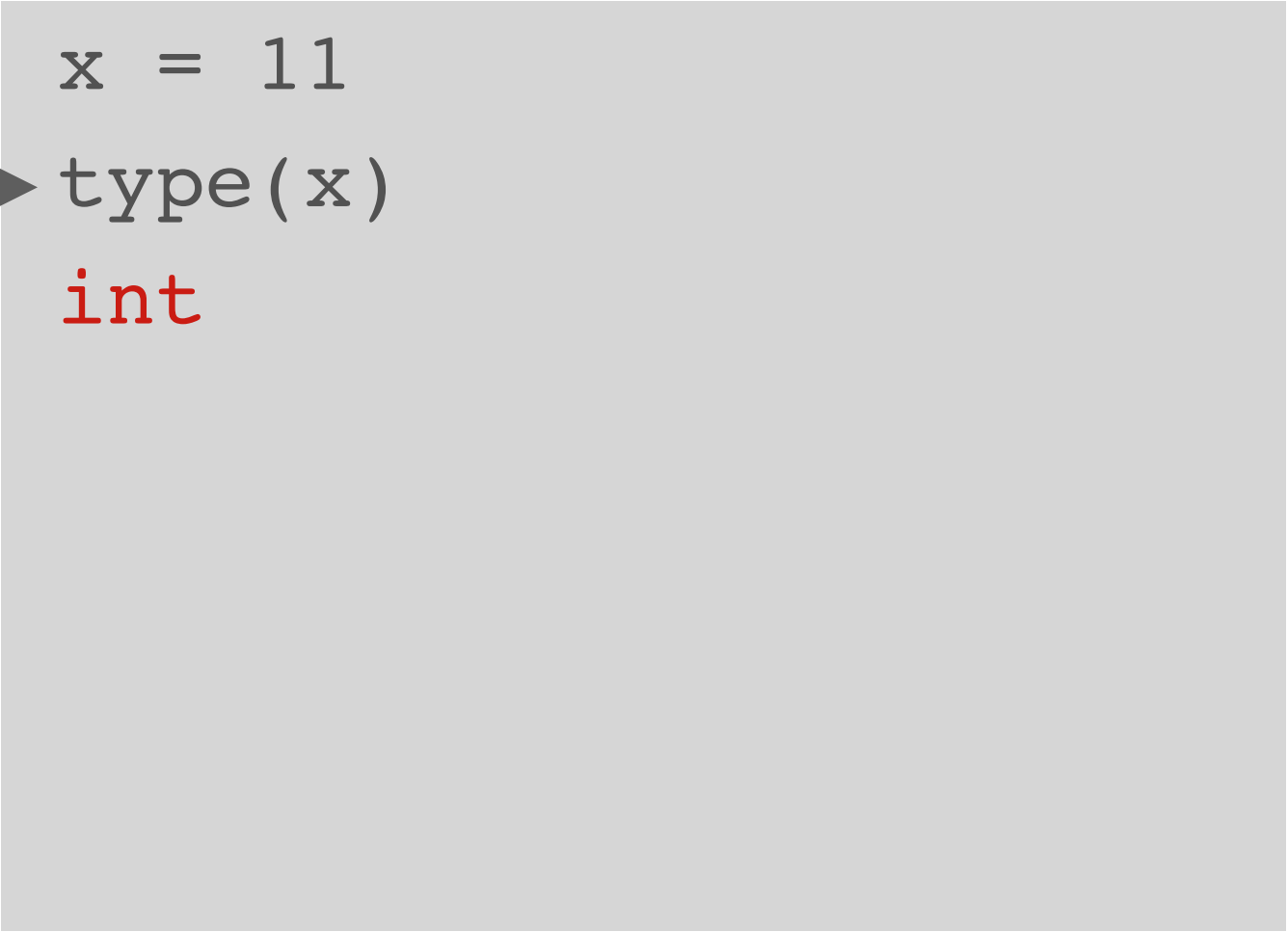
- A data type is the "type" of information that's being stored
 - character data (string)
 - numeric data (float, integer)
 - logical
- Data type is sort of like a "classification" of the information

DATA TYPE DETERMINES THE OPERATIONS THAT ARE ALLOWED ON THAT INFORMATION

- Example: `x = 42`
 - 42 is an integer (an `int`)
 - `int` is a data type
- We can multiply, add, subtract integers
 - there are also other operations for `ints`

YOU CAN CHECK THE DATA TYPE OF A VARIABLE WITH THE `type()` FUNCTION

When we use the `type()` function on `x` it shows that `x` is an `int` (integer)



```
x = 11
type(x)
int
```

YOU CAN CHANGE THE DATA TYPE STORED IN A VARIABLE

- You can assign a value of one data type, then assign a value of different type
- Example:
 - First store an integer in `x`
 - Then store a string in `x`

```
x = 11  
type(x)  
int
```

```
x = "This one goes to eleven."  
type(x)  
str
```

This is called “dynamic typing”

THERE ARE SEVERAL IMPORTANT DATA TYPES THAT YOU NEED TO KNOW

7 types you need to remember

data type	description	example
integer	whole number	42
float	number with decimal	2.72
string	sequences of text	Hello!
boolean	true or false	True
list	These are a little more complicated. To be explained later	
tuple		
dictionary		

- These are the most common built-in types
 - but there are other built-in types!

RECAP

RECAP OF WHAT WE LEARNED

- Variables store information
- Data types define the "type" of information being stored in a variable
 - 7 core data types
- You assign values to variables with the = sign
 - you can also re-use variable names
- Rules for variable names