

What the Hack: Variables | Episode 2 Challenges Solutions

Finish testing your knowledge? Take a look at some solutions to the challenges!

Challenge 1: Type Checking and Casting

```
a = "Hello"  
b = 100  
c = "100"  
d = 101.234
```

```
### Question 1. ###  
##Check the type of the variables below  
#we use the type() function to check the type of the variable  
#and use the print function to have Python display the type to us  
  
print(type(a))  
#in the output, it's printed that the type of variable a is <class 'str'>,  
which means it's a string  
#we can also tell that it is a string because the variable is enclosed with  
"" single quotation marks.  
#when the variable is assigned, ' ' single quotation will also make this  
variable a string  
  
print(type(b))  
#in the output, it's printed that the type of variable a is <class 'int'>,  
which means it's an integer, which means that it is a whole number  
#we can also tell that it is an integer because the variable has no decimals,  
not enclosed with any quotation marks  
  
print(type(c))  
#in the output, it's printed that the type of variable a is <class 'str'>,  
which means it's a string  
#although we see that the variable says 100, but it is not an integer because  
it is enclosed by the double quotation mark "". Similar to the type of the  
variable a, ' ' single quotation marks will also make it a string  
  
print(type(d))  
#in the output, it's printed that the type of variable a is <class 'float'>,  
which means it's a float, or a floating number.  
#although it is a number, but the number has decimals  
#remember that an integer is a whole number, just like how it is in math!
```

Question 2.

#Can you convert variable a to type float or type integer?

#for converting a variable to a float type variable, we use float()

```
print(float(a))
```

#the output shows an error message: "ValueError: could not convert string to float: 'Hello'"

#this means that we cannot convert the variable a to a float type variable.

#remember that our variable a is a string, and it says Hello.

#for converting a variable to an integer type, we use int(). (int is short for integer)

```
print(int(a))
```

#the output shows an error message: "#the output shows an error message: "ValueError: could not convert string to float: 'Hello'"

#float and integer are both for numbers, numbers with decimal and without decimal places, respectively.

#the content in our variable is written in English alphabets

#remember, English alphabets (abcdefg) and numbers (1234567) are not the same thing, thus we can't convert our variable a to a float or an integer

Question 3.

#Can you convert variable b to type float or type string?

#for converting a variable to a float type variable, we use float()

```
print(float(b))
```

#the output shows 100.0

#this means we successfully converted our variable b to a float type variable!

#one thing to notice is that 100.0 now has a decimal place, and it is different from the value in our original variable 100.

#remember that a float is a type of variable that has decimal places

#for converting a variable to a string type variable, we use str()

```
print(str(b))
```

#the output shows 100

#this means we successfully converted our variable b to a string type variable!

#it might be a little difficult to tell, because the value printed in the terminal looks the same as the value that we have when we initially assigned it to the variable b at the beginning of this program.
#but just remember, a string will have ' ' single quotation marks or "" double quotation marks when we have them in the editor, they just won't be displayed on the screen when we print them.

Question 4.

#Can you convert variable c to type float or type integer?

#for converting a variable to a float type variable, we use float()

```
print(float(c))
```

#the output shows 100.0

#this means we successfully converted our variable b to a float type variable!

#just notice that instead of 100, now it's 100.0, with a decimal number! because float is a number with decimal places

#for converting a variable to a integer type variable, we use integer()

```
print(int(c))
```

#the output shows 100

#this means we successfully converted our variable b to an integer type variable!

#the reason why we can do these is because, although the value of variable c is enclosed by double quotation marks, the inside of the value are essentially numbers (1 and 0).

#if they are numbers, then it is possible to convert them to a float or an integer.

#remember in question a, we couldn't convert "Hello" into a float, because "Hello" are alphabets, not numbers

Question 5.

#Can you convert variable d to type integer or type string?

#like what we've seen above, we convert a variable to an integer type variable using int()

```
print(int(d))
```

#the output shows 101

#this means we successfully converted the variable d to an integer type variable!

```
#notice that when the variable is converted from a float to an integer the
value is 101, instead of 101.234. We don't have decimal places anymore
#the reason for that comes from the difference between a float and an
integer. A float has decimal places, but an integer doesn't. So when a float
gets converted to an integer, the decimal places will be removed.
```

```
#like what we've seen above, we convert a variable to a string type variable
using str()
print(str(d))
#the output shows 101.234
#this means we successfully converted the variable d to a string type
variable!
#just like in question 3, #it might be a little difficult to tell whether our
variable is a string or a float from the display, because the value printed
in the terminal looks the same as the value that we have when we initially
assigned it to the variable b at the beginning of this program.
#again, a string will have ' single quotation marks or "" double quotation
marks when we have them in the editor, they just won't be displayed on the
screen when we print them.
```

Challenge 2: Asking for Input and Printing the Input

```
#input() is the function that we use for asking
#in the input() function, we can put the description of our question by
enclosing them in quotation marks, either ' single quotation marks or ""
double quotation marks
#we assign the input from the user to the variable name, so that the input
from the user will be saved into this variable
name = input("What is your name?: ")
#when we use the input() function, the content entered by the user will be
saved as a string.
#You can take a look at the type of the name variable by using
print(type(name))
```

```
#now, print a greeting to the user!
#We can print the things we want to say by enclosing them in quotation marks
again, either ' single or "" double
#we want to greet the user with the name that they just told us (they just
entered to our program), so we concatenate the input (our user's name) with
our "Hello" message
print("Hello " + name)
#the reason why there is a space after Hello is because, when the Hello
message and the name are concatenated, they are not separated by anything,
but in English, we have a space between words.
```

Challenge 3: Make Your Own Small Calculator

```
#we use the input() function to ask the user for a number
#remember when we use the input() function, the content entered by the user
will be saved as a string
#in this challenge, because we want to work with numbers, we will need to
convert what the user entered to an integer. We do that using the int()
function
number = int(input("Enter a number: "))

#When we want to get the quotient from our number divided by 2, we use the //
floor division operator
#we save the result from this calculation to our variable called quotient
quotient = number // 2

#when we want to get the remainder from our number divided by 2, we use the %
modulo operator
#we save the result from this calculation to our variable called remainder
remainder = number % 2

#we are going to display the result of the calculation using the print()
function
#we will put the results in a proper English sentence, and we do that using
string concatenation, meaning using a + operator between the strings
#because we are using string concatenation, our quotient and remainder will
need to be in strings too, so we convert that by using the str() function.
print("Your number divided by 2 is " + str(quotient) + ",and the remainder is
" + str(remainder))

#if we don't want to use string concatenation and we don't need to make the
display message readable, we could simply print the two numbers
print(quotient, remainder)
#however, it's a good practice to make things clear by formatting what's
being displayed properly for the people that are using your program.
```