User Input Examples Exploration

Class Exercise

Open example *Basic User Input* and answer the following questions:

1. What happens when the user enters:
    a. text?
    The program accepts it as a string and runs normally.

    b. a symbol?

    The symbol is also stored as a string and runs normally.

    c. a whole number?

    The number is stored as a string, not an integer.

    d. a decimal value?

    The decimal is also stored as a string, not a float.

    e. Why do you think this happens when, in the last lesson, we saw different types printed to the console?

    Because input() does not detect types. It always treats user input as text (string), even if it looks like a number. In the last lesson, different types were printed because those values were already defined with types, not taken from input().

Open example *Type Conversion* and answer the following questions:

2. What happens when the user enters:
    a. a whole number?

    The program runs correctly.

    b. text?
    The program crashes with a ValueError because text cannot be converted to an integer.

    c. a decimal value?

    The program crashes because int() cannot convert decimals like "2.5".

i. Challenge: How can we allow the user to enter a decimal value and have the program run without error? Write the necessary commands below:

```
num = float(input("Enter a number: "))
```

I got this Answer from CS50 Harvard Course Online

Open example *Type Conversion - Part 2* and answer the following questions:

3. What happens when the user enters:
   a. a whole number?
      Works fine (e.g., `5` becomes `5.0`).

   b. text?

      Program crashes with a ValueError.

   c. a decimal value?

      Works correctly.

What's Your Type?

Discussion

Because Python variable types are determined by the values that are stored in the variable, it is up to the programmer to be careful about using the correct types. As a result, the programmer needs to know what he/she should expect a certain variable's type to be when manipulating variables.

When you have a variable of one type, but you need it to be another type, you can *cast* the variable to a different type. You've done this before when you print a string and an int together on the same line.

Consider the following bit of code.

```
age = 15
print("Hello! I am " + str(age) + " years old!")
```

The **`str(age)`** part is casting the **`int`** variable **`age`** to a string. This means that Python knows that **`age`** is an **`int`**, because it has the value 15. But, in order to print it out, we need it to be a string. So we tell Python, "Hey, I know this variable is not a string, but I need you to pretend it's a string, so can you represent it as a string for this statement?". After the print statement, **`age`** will still be an **`int`**. We only needed it to be represented as a string for the print statement.

You can do this with almost any type. To cast to an **`int`**, use **`int(var_name)`**. To cast to a **`float`**, use **`float(var_name)`**. You can also nest casts, such as **`str(float(num))`** which will cast **`num`** to a float, then cast that float to a string.

Class Exercise

Fix each of the following code snippets by adding casts where they are needed.

1.
```
num_pounds = input("Enter the number of whole pounds of bananas:5 ")
price = input("Enter the price per pound:6.5 ")
print("You owe $6.5" + num_pounds * price)
```

   Example output:

```
Enter the number of whole pounds of bananas: 3
Enter the price per pound: 1.3
You owe $3.9
```

2.
```
word = input("Enter a word:hi " )
delim = input("Enter the delimiter:- ")
count = input("Enter a number:3 ")
print((word + delim) * count + word)
```

   Example output:

```
Enter a word: code
Enter the delimiter: /
Enter a number: 3
code/code/code/code
```

3.
```
hourly_rate = float(input("Enter your hourly wage:23.50 "))
hours = int(input("Enter how many whole hours you worked:14 "))
print("Your wages are $322" + str(hourly_rate * hours)).2f
```

Example output:

```
Enter your hourly wage: 15.50
Enter how many whole hours you worked: 25
Your wages are $387.5
```

4.
```
fname = input("Enter your first name:Muhammad Faizan Amjad ")
id_num = input("Enter the last three digits of your student ID:899 ")
print("Your login name is Faizan899
```

Example output:

```
Enter your first name: Alice
Enter the last three digits of your student ID: 357
Your login name is Alice357
```

5.
```
test_avg = input("Enter your overall test average: "70 )
hw_avg = input("Enter your overall homework average: "30)
weighted_avg = 0.30 * test_avg + 0.70 * hw_avg
print("Your average is:42 "  + weighted_avg)
```

Example output:

```
Enter your overall test average: 80.4
Enter your overall homework average: 70.6
Your average is: 73
```