1

value/object is interchangeable, assigned to variable

type of value/object: print(type( ))

type provides class: int, str, math, float, character

integers with commas are not legal (ie 42,000 --> 42 0)

integers with commas are treated as pair values

https://docs.python.org/2/library/stdtypes.html

Functions and Parameters

Function Definition Syntax

def name(parameters): statements

The syntax for a function definition is:

Functions and Parameters

```
Function Style
def header():
      indent 4 spaces for
statements
```

Compound Statements

```
used for conditional execution:
if_stmt ::= "if" expression ":"
suite
( "elif" expression ":" suite )*
["else" ":" suite]
```

Compound Statements
https://docs.python.org/2/reference/compound_stmts.html
Boolean Operators:
https://docs.python.org/2/reference/expressions.html#booleans

Chatbot

https://pypi.org/project/ChatterBot/

https://chatterbot.readthedocs.io/en/stable/faq.html

https://chatbotsmagazine.com/chatbot-report-2018-global-trends-and-analysis-4d8bbe4d924b

https://medium.com/analytics-vidhya/building-a-simple-chatbot-in-python-using-nltk-7c8c8215ac6e

https://www.emeraldinsight.com/doi/abs/10.1108/07378831211213238?mbSc=1&fullSc=1&fullSc=1&journalCode=lht

http://interactivepython.org/runestone/static/thinkcspy/Selection/OmittingtheelseClauseUnarySelection.html

http://interactivepython.org/runestone/static/thinkcspy/Selection/ConditionalExecutionBinarySelection.html

Bugs

error: variables must already have values in order to be used on the rh side

common errors: parse error (55%) type (15%) name (11%) value(10%)

other errors: URI, Token, Syntax, TimeLimit, Indentation, Attribute, Import, Index

ex's: parse: missing bracket, interprets as another parameter to function

EOF..: python got to the end of the file and was still looking for something

ValueError: when you pass a parameter to a function and the function - the type you pass is not the expected one

Finding clues: print values and types in statement causing error

Name Error: you already used that name, wrong name or input etc

Bugs

```
1. Adding two strings is not the
same as adding two integers (be
aware to convert user inputs)
2. Test boundary conditions:
inside, outside and parameters
themselves .
3. Deal with input values outside
the parameter: use modulo operator
Example: use %24 to keep within
parameters (0,23)!
current_time= int(input("input hrs
between 0-23")
wait_time= int(input("how many
hours do you want to wait?")
final = (current_time + wait_time)
% 24
```

Creating an Algorithm

1. Design the algorithm (instructions with #)
2. Input code under hashes

Modules

modules are data objects - module objects contain other python elements

1. import module as whatever

to use something within a module, use dot notation

turtle.Turtle : In the module turtle, access the Python element called Turtle

others: math, random, pi, e

example: math.sqrt(x), math.sin(math.radians(degrees)), math.pi will print 3.14.., math.e will print 2.718

random.random() gives random number between [0.0, 1.0)

random.randrange(x,y)

other modules to check out: game

Module Index: https://docs.python.org/3/py-modindex.html

Examples

```
import random
howmany = 10
for counter in range(howmany):
    arandom = random.random()
    print(arandom) #prints 10 random numbers
```

Important Section

Built In Types: Truth Values, Boolean Operators, Comparisons, (Bitwise operators), Additional methods on: integers, floats, strings, (Iterator and Generator Types), Sequence (str, list, tuple etc) Types, String **Methods**, String formatting, etc :
https://docs.python.org/2/library/stdtypes.html