1. Variables: Containers for storing data values.

x = 5

name = 'Alice'

2. Input: Getting user input.

name = input('Enter your name: ')

OR x = input()

3. Output: Printing to the console.

print('Hello, World!')

4. Data Types: Different kinds of data.

- Integer: x = 5

- Float: pi = 3.14

- String: name = 'Alice'

- Boolean: is\_valid = True

len(x) takes the length of x, works for lists, strings

*You don’t need to define whether the data is an integer, float, etc. Python automatically adjusts the data type accordingly. Python uses single quotes, ‘’, instead of double quotes, “”.*

5. Lists: Ordered collections of items.

fruits = ['apple', 'banana', 'cherry']

fruit.append(‘pineapple on pizza’) #adds item to the end of the list

fruit.insert(0, ‘milk on pizza’) #inserts item to the specified index, not after but AT (e.g. 0 would mean at the beginning of the list)

fruit.remove(‘apple’) #removes the string ‘apple’ from the list, works also for other data types

fruit.pop(0) #removes item 0 of the list (i.e. first term)

fruit[1] #calls the 2nd term of the list

6. Loops: Repeating a block of code.

- For loop:

for fruit in fruits:

print(fruit)

*(where fruits is a list, loops list items)*

for i in range(#):

print(i)

*this will work to repeat # times*

- While loop:

count = 0

while count < 5:

print(count)

count += 1

7. Conditionals: Making decisions in code.

if age >= 18:

print('Adult')

elif age <= 3:

print(‘Baby’)

else:

print('Minor')

Parts or conditionals

if <condition 1> and <condition 2>:

if <condition 1> or <condition 2>:

if <boolean variable name> is <boolean>:

*elif means else if*

8. Functions: Reusable blocks of code.

def greet(name):

return ‘hello’ + name

print(greet('Alice'))

*use return to return a value*

9. Strings: Handling text.

greeting = 'Hello'

print(greeting)

*(prints out “greeting”)*

10. Comments: Annotating your code.

# This is a single-line comment

11. Mathematical Operations: Performing calculations.

# Addition

result = 5 + 3

# Subtraction

result = 10 - 4

# Multiplication

result = 7 \* 6

# Division

result = 8 / 2

# Exponentiation

result = 2 ^ 3

# Modulus

result = 10 % 3

12. String Methods: Working with text.

- Splitting Characters: Breaking a string into a list of words or characters.

text = 'Hello, World!'

words = text.split() # Split by whitespace

chars = list(text) # Split into individual characters

- Joining Characters: Combining a list of characters or words into a single string.

words = ['Hello', 'World']

sentence = ' '.join(words) # Joins with a space

13. String Slicing: Extracting parts of a string.

text = 'Hello, World!'

slice = text[0:5] # 'Hello'

alternatively text[0] is the 1st character of text string, etc.

14. String Formatting: Creating formatted strings.

name = 'Alice'

age = 30

message = f'{name} is {age} years old.'

15. Conversions

x = str(#) will convert the integer # to a string and store it in the variable x

x = int(‘6’) will convert the string 6 to an integer and store it in the variable x