

# NASA@ MyLibrary: JWST Python Demo

## Tie in:

A space telescope is very far away, so we can't physically go there to operate it. We have to use computers and computer programs to operate the telescope remotely.

## Concepts:

- Strings
- Variables
- Arrays or lists (of strings)
- Loops
  - By "for each"
  - By index

## About Python:

Python is a popular programming language for first-time learners, because it is very simple. Traditionally, one of the first things a programmer learns is how to print the phrase "hello world" to a screen.

```
# hello world in different programming languages
# examples of how to print "hello world" to the screen

# python
print("hello world")

# java
class HelloWorld {
    public static void main(String[] args) {
        System.out.println("hello world");
    }
}

# c++
include <iostream>
int main()
{
    cout << "hello world" << endl;
    return 0;
}
```

Demo:

Print a "raw" string (like "hello world")

```
# 1
print("hello world!")

# 2
# print someone's name
```

Assign strings/names to variables; print variables

```
name = "cole" # hard coded

print("hello, " + name) # what happens when I run this?
```

```
# what if we don't know ahead of time what the name is?
name = input("what's your name? ")

print("hello, " + name + "! thanks for coming!")
```

## Store string variables in array/list

```
# what if I want to store a bunch of names?

# 1
# initializing list to make it contain nothing
names = [] # empty list
print("list has " + str(len(names)) + " names in it")
# len -> "length"
# str(x) turns x into a string, which can be added with the + sign

# 2
# let's put 5 names in the list with while loop
while len(names) < 5:
    name = input("what's your name?")
    names.append(name)

print("list has " + str(len(names)) + " names in it")

# 3
# how do we see all the names in the list?
# for loop
for name in names:
    print("hello, " + name)
```

By index # what if i want to print just the 1st name?

```
# 1
# how do i print just one name?

# new list (hard coded)
names = [
    "thor",
    "iron man",
    "captain marvel",
    "scarlet witch",
    "spiderman"
]
print("list has " + str(len(names)) + " names in it") #can only print strings

# 2
# how do I print just the first name?
print("the first name is " + names[1])

# 3
# fill in the puzzle
names = [
    "thor",          #
    "iron man",      # 1
    "captain marvel", #
    "scarlet witch", #
    "spiderman"      #
]

# 4
# what if I want to print a different name?
```