

# Reading and Research - Lists

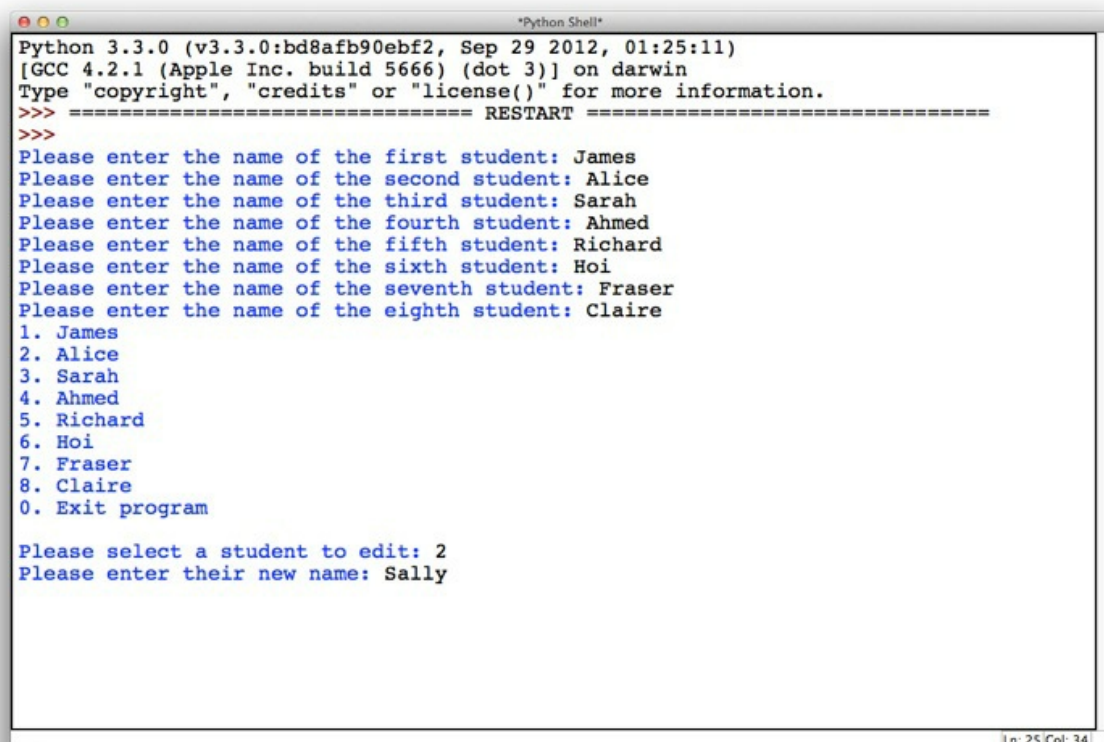
These tasks are designed to introduce you to the programming topic we will be studying in class next lesson. You **must** complete these activities prior to the lesson.

## Task 1

Create a program that will:

- Store the names of eight students and then display them on the screen as a menu.
- Select a student from the menu and edit their name.
- Redisplay the menu so that it is possible to see the changes you have made

You can see an example of the running program below. Try and use **iteration** where possible.



```
Python 3.3.0 (v3.3.0:bd8afb90ebf2, Sep 29 2012, 01:25:11)
[GCC 4.2.1 (Apple Inc. build 5666) (dot 3)] on darwin
Type "copyright", "credits" or "license()" for more information.
>>> ===== RESTART =====
>>>
Please enter the name of the first student: James
Please enter the name of the second student: Alice
Please enter the name of the third student: Sarah
Please enter the name of the fourth student: Ahmed
Please enter the name of the fifth student: Richard
Please enter the name of the sixth student: Hoi
Please enter the name of the seventh student: Fraser
Please enter the name of the eighth student: Claire
1. James
2. Alice
3. Sarah
4. Ahmed
5. Richard
6. Hoi
7. Fraser
8. Claire
0. Exit program

Please select a student to edit: 2
Please enter their new name: Sally
```

# Task 2

Having created the program in Task One, use the the space below to describe its shortcomings: You have to make a variable for each name of the student because iteration will not work for that purpose.

## Task 3 - Arrays

Rather than creating individual variables for each student it is possible to create a single data structure called an **array** to store all of the students names.

Research array data structure on the internet (e.g. wikipedia) and then in the space below explain how an array could be used to improve the program from Task 1.

An array is a data structure that contains a group of elements. Typically these elements are all of the same data type, such as an integer or string.

When displaying the results, the program will output one element of the array at a time. This may be done for a specified number of values or until all the values stored in the array have been output.

While the program could create a new variable for each result found, storing the results in an array is much more efficient way to manage memory.

## Task 4 - Lists

Most programming languages have the concept of an array data structure but Python does not. Instead, Python has **Lists**, which are similar to arrays but with important differences.

Array	List
Initial size must be declared e.g. this array has 100 items	No initial size is required
Once declared the size can not be changed	Size can expand or contract as required
Contains only data of a single type e.g. strings	Can contain different data types

There are various concepts and operations you need to be familiar with before you can use Lists in Python. Read about Lists in Python on the Python School website:

1. [Lists in Python](#)
2. [Lists and FOR Loops](#)
3. [List Operations](#)

## Task 5

Using your knowledge of Python Lists, Functions and Iteration improve the program from Task 1.

**Paste** the code for your original Task 1 in the space provided below:

```
#original code for task 1
#Daniel Ogunlana
#List's R&R
#07/12/14

first_student = str(input("Please enter the name of the first
student: "))
second_student = str(input("Please enter the name of the second
student: "))
third_student = str(input("Please enter the name of the third
student: "))
fourth_student = str(input("Please enter the name of the fourth
student: "))
fifth_student = str(input("Please enter the name of the fifth
student: "))
sixth_student = str(input("Please enter the name of the sixth
```

```

student: "))
seventh_student = str(input("Please enter the name of the seventh
student: "))
eighth_student = str(input("Please enter the name of the eighth
student: "))

students_list = first_student, second_student, third_student,
fourth_student, fifth_student, sixth_student, seventh_student,
eighth_student

for count in students_list:
    print(count)

place_to_change = int(input("Please select a student to edit: "))
student_name_change = str(input("Enter the new student name: "))
students_list.insert(place_toChange, student_name_change)
for count in students_list:
    print(count)

```

**Paste** the code for your improved Task 1 in the space provided below:

```

#improved code for task 1
#Daniel Ogunlana
#List's R&R
#07/12/14

first_student = str(input("Please enter the name of the first
student: "))
second_student = str(input("Please enter the name of the second
student: "))
third_student = str(input("Please enter the name of the third
student: "))
fourth_student = str(input("Please enter the name of the fourth
student: "))
fifth_student = str(input("Please enter the name of the fifth
student: "))
sixth_student = str(input("Please enter the name of the sixth
student: "))
seventh_student = str(input("Please enter the name of the seventh
student: "))
eighth_student = str(input("Please enter the name of the eighth
student: "))

students_list = [first_student, second_student, third_student,

```

```
fourth_student, fifth_student, sixth_student, seventh_student,
eighth_student]

for each in students_list:
    print(each)

place_to_change = int(input("Please select a student to edit: "))
student_name_change = str(input("Please enter their new student
name: "))
students_list.insert(place_to_change, student_name_change)
for count in students_list:
    print(count)
```

## Summary

In this R&R you have investigated Lists. You have seen how Lists are used to simplify your code when you need to work with lots of similar data. You have read about the differences between Lists in Python and Arrays in other programming languages.

Please make sure you have completed this R&R fully before your next programming lesson as it will form the basis of the initial classroom discussion and starter tasks.

Written with [StackEdit](#).