Hillview International School: Year 9

Programming in Python: Lists

Lesson outcomes

By the end of this lesson, you will be able to:

- Understand and use lists in your programs

- Write and use for loops to process lists

What are lists and why do we need them?

- Lists hold a series of values

- Much less code to process lists rather than separate variables:

Using lists:

```
for name in name_list:
    print(name)
```

Without using lists:

```
print(name1)
print(name2)
print(name3)
print(name4)
print(name5)
```
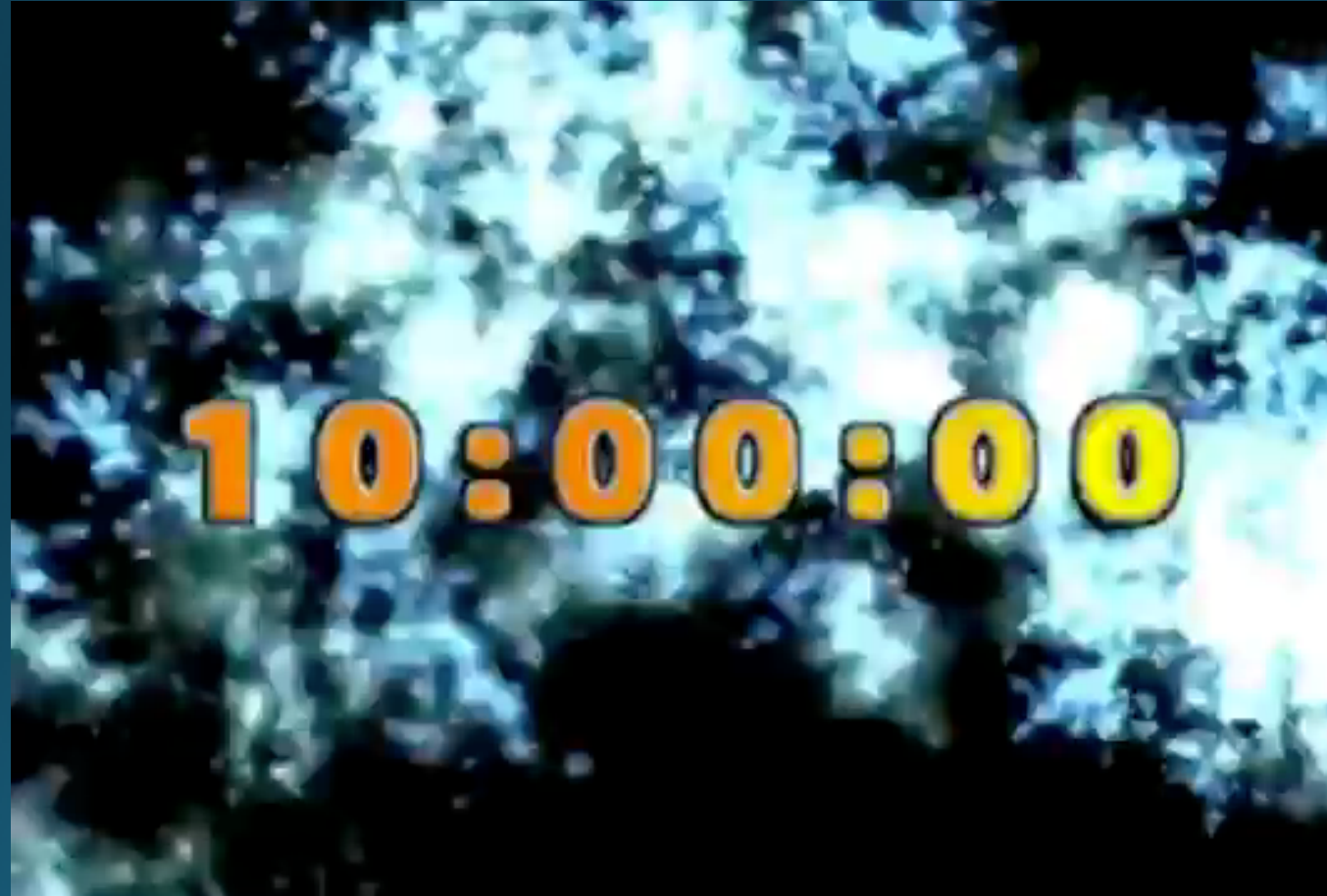
name   name   name

Creating a list

- Use square brackets [ ]

- Separate items with commas

- Contents can be Strings, Ints, Floats or any other data type… including other lists!

- Contents can be values or variables

```
list_of_names = ["Liz", "Philip", "Charles"]
```

Activity 1: Average numbers

List operations

To build and modify lists, we use these operations:

- **`my_list.append("lion")`** - will add the item lion to the end of the list

- **`my_list.insert(3,"lion")`** - will add "Lion" before item 3 in the list

- **`my_list.pop(5)`** - will delete the 5th item

In the previous exercise, we also used a function:

- **`len(my_list)`** - counts the number of items in the list – the list length

Building a list from user input

Use a loop to receive input and append to the list:

```python
number_list = []
more_numbers = True


# Get a list of numbers - end the loop by entering a blank
while more_numbers:
    number = input("Input a number (press 'enter' to finish): ")
    if number == "":
        more_numbers = False
    else:
        number_list.append(float(number))
# End while loop
```

Activity 2: Average numbers 2

Computers count from zero

- The first item in a list is item 0:
  ```
  my_list[0]
  ```

- The last item in a list is item (length – 1) – for example:
  ```
  len(my_list) = 5
  my_list[4]   # Last item
  ```

- This is because computers count from zero

Homework exercise

Write a program that:

- Builds a shopping list

- Use a loop to gather items one at a time
    - Finish when the user hits enter without typing anything

- Finally outputs the whole shopping list

Lesson summary

You should now be able to:

- Understand and use lists in your programs

- Write and use for loops to process lists

On Monday:

- We begin our big assessment project!

    - Introducing the task

    - Designing the solution

        - Computational Thinking!

        (check out the new Year 8 slides on Computational Thinking)

- Warning: this is 25% of your end of year mark!