COMP07027 Introduction to Programming

School of Computing, Engineering and Physical Sciences Scotland Academy Wuxi

Lecture 4: Set, Dictionary, If...Else

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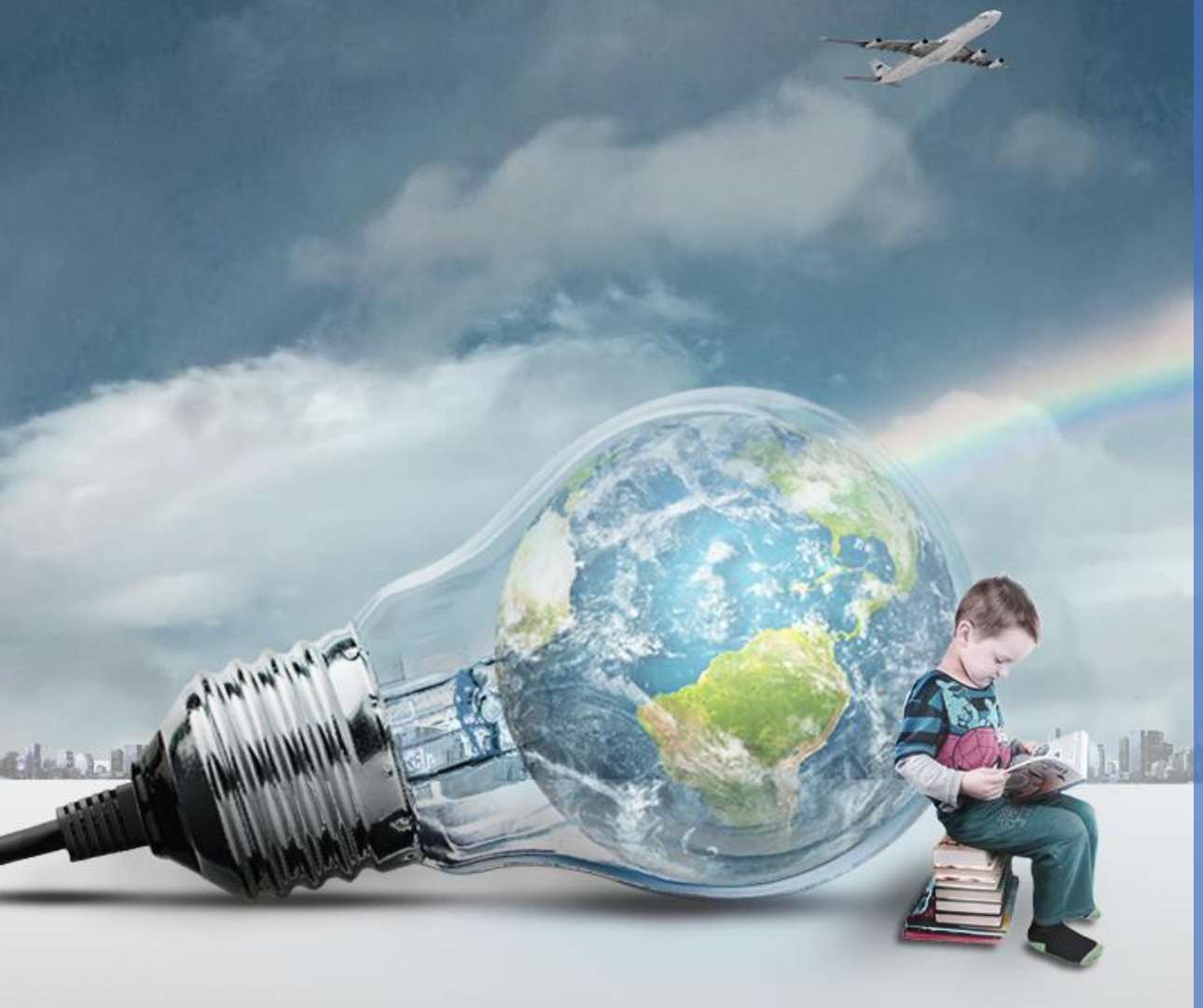
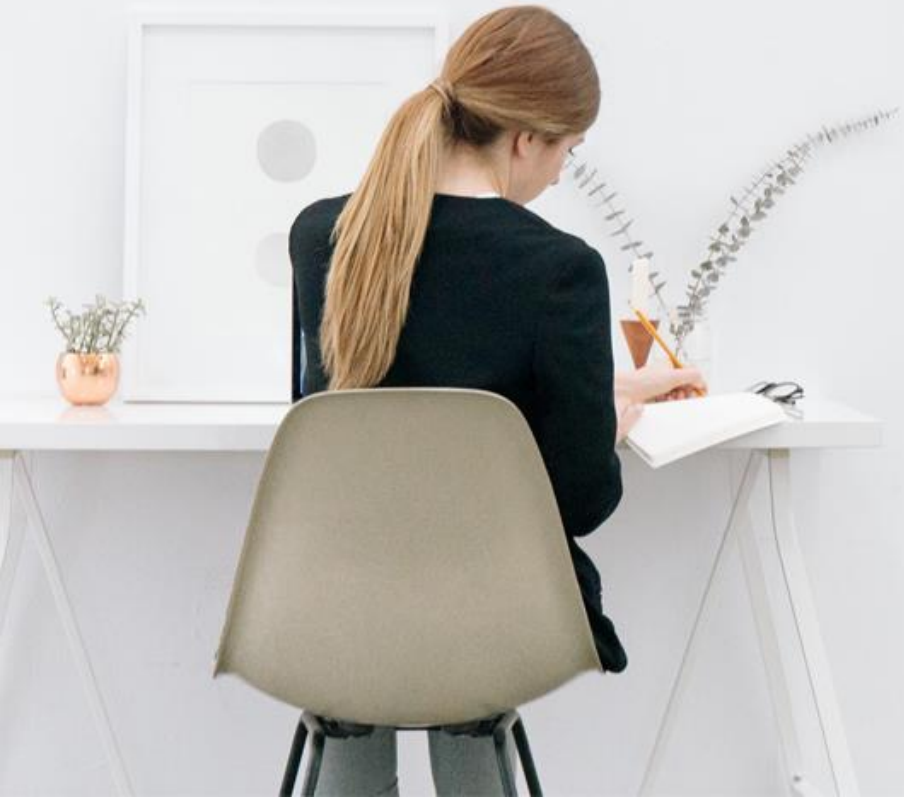
Agenda of the lecture 4



01 Python Set

02 Python Dictionary

03 Python If…Else



1-Python Sets

Python Sets

- Sets are used to store multiple items in a single variable.
- A set is a collection which is both *unordered* and *unindexed*.
- Round brackets are used to make lists:

```
myset = {“Football", “Hockey", “Tennis”}
print(myset)
```

- Tuples items are unordered and unindexed: Set items are unordered, unchangeable, and do not allow duplicate values.

```
myset = {“Football", “Hockey", “Tennis”}
print(myset)
```

- Duplicate values will be ignored:

```
myset = {"apple", "banana", "cherry", "apple"}
print(myset)
```

Python Sets length and datatypes

- Use the len() method to find out how many items are in a se:

```
myset = {“Football", “Hockey", “Tennis“}
print(len(myset))
```

- Any data type can be used as a list item:

```
s1 = {“Football", “Hockey", “Tennis“}
s2 = {6, 4, 76, 6, 3}
s3 = {9.5, 5.3, 4.5}
```

- Different data types can be found in a single set:

```
myset = {“Jin", 32, False, 22, “Hi”, 22}
```

- tuple are defined as objects of the data type ‘set' from the Python perspective:

```
myset = {“Football", “Hockey", “Tennis“}
print(type(myset))
```

- In building a new set, we can also use the set() constructor.

```
myset = set((“Football", “Hockey", “Tennis“))
print(myset)
```

Python - Access set Items

- The items in the set are unindexed, that’s why we can not access the item od set with indexing.
- Loop through the set, and print the values:
- ```
  mytset = {“Football", “Hockey", “Tennis”}
  for x in myset:
    print(x)
  ```
- Check if "banana" is present in the set:
- ```
  mytset = {“Football", “Hockey", “Tennis”}
  print(“Hockey" in myset)
  ```

- Once a set is created, you cannot change its items, but you can add new items.

Python - Add sets

- To add one item to a set use the add() method

```
myset = {“Football", “Hockey", “Tennis”}
myset.add(“cricket")
print(myset)
```

- Add elements from tropical into myset:

```
thisset = {"apple", "banana", "cherry"}
tropical = {"pineapple", "mango", "papaya"}
thisset.update(tropical)
print(thisset)
```

- Add Any Iterable:

```
thisset = {"apple", "banana", "cherry"}
mylist = ["kiwi", "orange"]
thisset.update(mylist)
print(thisset)
```

Python - Remove Set Items

We can specify the data type, although we do not need particularly.

```
myset = {“Football", “Hockey", “Tennis”}
myset.remove(“Hockey")
print(myset)
```

- Remove the last item by using the pop() method:

```
myset = {“Football", “Hockey", “Tennis”}
myset.pop()
print(myset)
```

- The clear() method empties the set:

```
myset = {“Football", “Hockey", “Tennis”}
myset.clear()
print(myset)
```

Python - Loop Sets

- Loop through the set, and print the values:

```
myset = {“Football", “Hockey", “Tennis”}
for x in myset:
  print(x)
```

Join Two Sets

•You can use the union() function to create a new set that has all of the items from both sets:

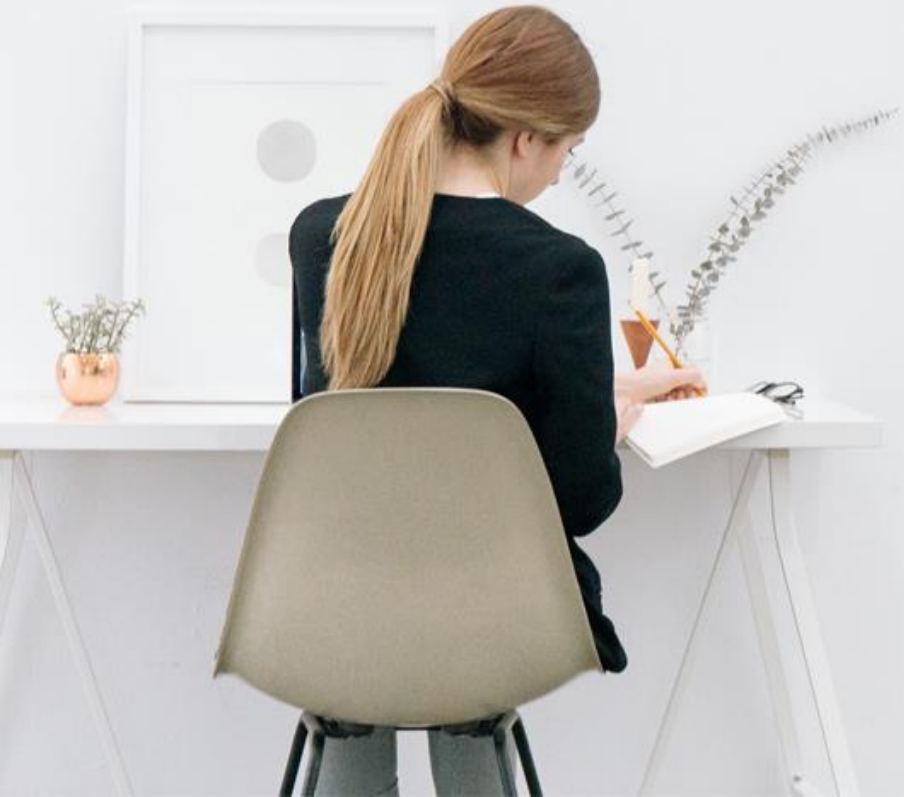
```
set1 = {"a", "b" , "c"}
set2 = {1, 2, 3}
set3 = set1.union(set2)
print(set3)
```

- you can use the update() method to insert all of the things from one set into another:

```
set1 = {"a", "b" , "c"}
set2 = {1, 2, 3}
set1.update(set2)
print(set1)
```

- The intersection_update() method will keep only the items that are present in both sets.

```
x = {"apple", "banana", "cherry"}
y = {"google", "microsoft", "apple"}
x.intersection_update(y)
print(x)
```



1-Python Dictionaries

Python Dictionaries

- Data values are stored in key:value pairs using dictionaries.
- Curly brackets are used to write dictionaries, which have keys and values:.

```
mydict = {
  “class": “CS",
  “suject": “Programming",
  "year": 2021
}
print(mydict)
```

- Dictionary items are ordered, changeable, and does not allow duplicates.
- The key name can be used to refer to dictionary elements, which are given in key:value pairs.

```
mydict = {
  “class": “CS",
  “suject": “Programming",
  "year": 2021
}
print(mydict[“class”])
```

Python Dictionaries

- Dictionaries cannot have two items with the same key:

```
mydict = {
  “class": “CS",
  “suject": “Programming",
  "year": 2021,
  "year": 2020,
}
print(mydict)
```

- Print the number of items in the dictionary:

```
mydict = {
  “class": “CS",
  “suject": “Programming",
  "year": 2021

}
print(len(mydict))
```

Dictionary Items - Data Types

- String, int, boolean, and list data types:

```
mydict = {
  “class": “CS",
  “suject": “Programming",
  "year": 2021

}
print(mydict)
```

- Print the data type of a dictionary:

```
mydict = {
  “class": “CS",
  “suject": “Programming",
  "year": 2021

}
print(type(mydict))
```

There is also a method called get() that will give you the same result.

Python - Access Dictionary Items

- The items in a dictionary can be accessed by referring to the key name, which is enclosed in square brackets:

```
mydict = {
  “class": “CS",
  “suject": “Programming",
  "year": 2021
}
print(mydict[“class”])
```

- Get the different part of doctionary:

```
x = mydict.get("model")
print(x)
y = mydict.keys()
print(y)
z = mydict.values()
print(z)
u = mydict.items()
print(u)
```

Python - Change Dictionary Items

- You can change the value of a specific item by referring to its key name:
-
```
mydict = {
  “class": “CS",
  “suject": “Programming",
  "year": 2021
}
mydict[“class”] = 2022
```

- Update the "year" of the car by using the update() method:

```
mydict = {
  “class": “CS",
  “suject": “Programming",
  "year": 2021
}
mydict.update({"year": 2022})
```

Python - Add Dictionary Items

- Adding an item to the dictionary is done by using a new index key and assigning a value to it:

```
mydict = {
  “class": “CS",
  “suject": “Programming",
  "year": 2021
}
mydict[“room"] = 230
print(mydict)
```

- Add a month item to the dictionary by using the update() method:

```
mydict = {
  “class": “CS",
  “suject": “Programming",
  "year": 2021
}
mydict.update({“month”: “Sep”})
print(mydict)
```

Python - Remove Dictionary Items

- The pop() method removes the item with the specified key name:

```
mydict = {
  “class": “CS",
  “suject": “Programming",
  "year": 2021
}
mydict.pop(“year”)
print(mydict)
```

- The clear() method empties the dictionary::

```
mydict = {
  “class": “CS",
  “suject": “Programming",
  "year": 2021
}
mydict.clear()
print(mydict)
```

Loop Through a Dictionary

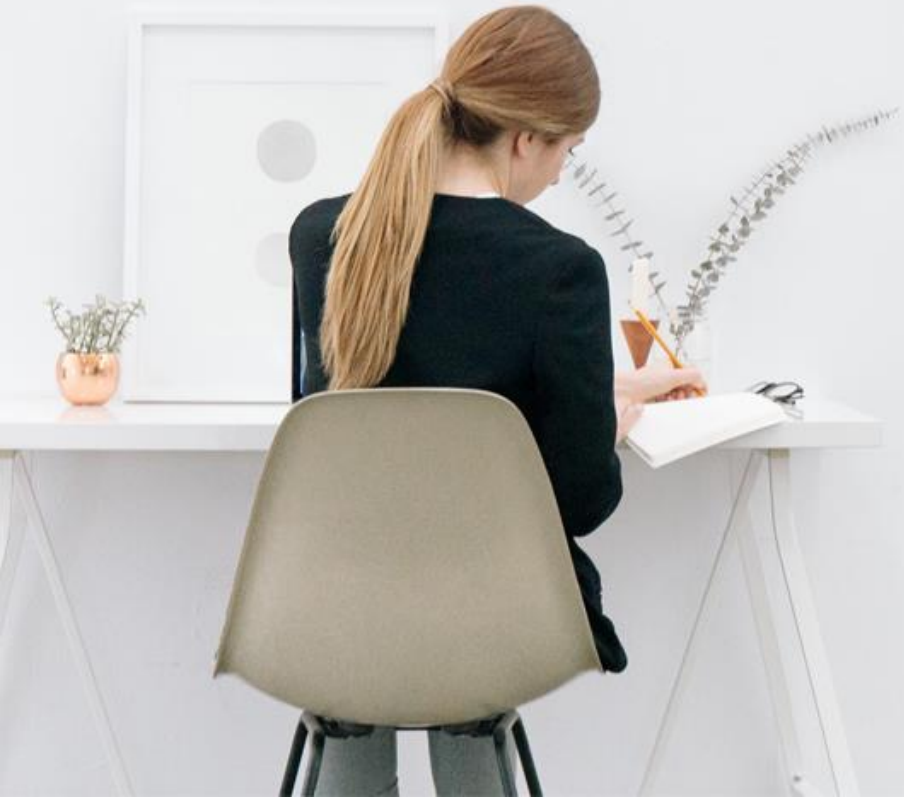
- Print all key names in the dictionary, one by one:

```
mydict = {
  “class": “CS",
  “suject": “Programming",
  "year": 2021
}
for x in mydict:
  print(x)
for x in mydict.values():
  print(x)
for x in mydict.keys():
  print(x)
for x, y in thisdict.items():
  print(x, y)
```

Python - Copy Dictionaries

- Make a copy of a dictionary with the copy() method:

```
mydict = {
  “class": “CS",
  “suject": “Programming",
  "year": 2021
}
newdict = mydict.copy()
print(mydict)
print(newdict)
```



1-Python if…else

Python If … Else

- Python supports the following standard mathematical logical conditions:
    1. Equals: `a == b`
    2. Not Equals: `a != b`
    3. Less than: `a < b`
    4. Less than or equal to: `a <= b`
    5. Greater than: `a > b`
    6. Greater than or equal to: `a >= b`
- These conditions can be employed in a variety of situations, the most popular of which being "if statements" and loops.
- The if keyword is used to create a "if statement.“

```
x = 88
y = 76
if x > y:
  print(“x is greater than y")
```

- Indentation: We have to follow basic python syntax to follow the line rules
-

```
x = 88
y = 76
if x > y:
print(“x is greater than y") # this will show us an error of indentation
```

Python Elif

- The elif keyword in Python means "attempt this condition if the previous conditions were not true:

```
x = 88
y = 76
if x > y:
  print(“x is greater than y")
elif x < y:
    print(“y is greater than x")
```

- Indentation: We have to follow basic python syntax to follow the line rules

```
x = 88
y = 76
if x > y:
print(“x is greater than y") # this will show us an error of
indentation
```

Python else

- Anything that isn't covered by the preceding conditions is caught by the else keyword.

```
x = 88
y = 76
if x > y:
  print(“x is greater than y")
elif x == y:
    print(“Both values are equal")
Else:
    print(“y is greater than x ")
```

- You can also have an else without the elif:

```
x = 88
y = 76
if x > y:
  print(“x is greater than y")
Else:
    print(“y is greater than x ")
```

Python else

- Anything that isn't covered by the preceding conditions is caught by the else keyword.

```
x = 88
y = 76
if x > y:
  print(“x is greater than y")
elif x == y:
    print(“Both values are equal")
Else:
    print(“y is greater than x ")
```

- You can also have an else without the elif:

```
x = 88
y = 76
if x > y:
  print(“x is greater than y")
Else:
    print(“y is greater than x ")
```

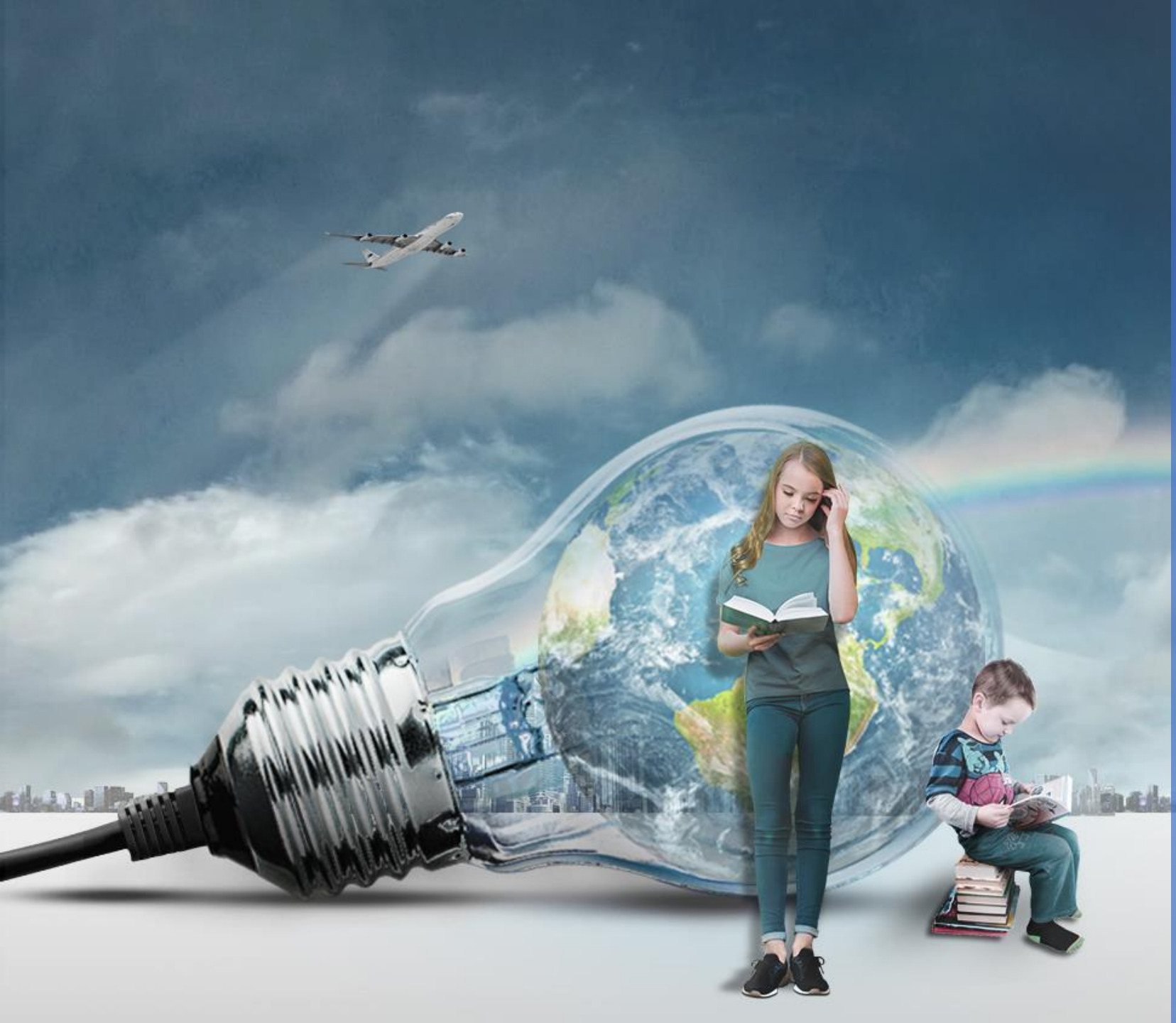
Python with And condition

- The and keyword is a logical operator that joins conditional expressions together:

```
x = 88
y = 76
Z = 30
if x > y and y > z:
  print("x is greater than y and z")
elif x < y and y > z :
    print("y is greatest value")
elif x < y and y < z :
    print("z is greatest value")
Else:
    print(" Other possible situation can be true")
```

- The or keyword is a logical operator:

```
x = 88
y = 76
Z = 30
if x > y or z < y:
  print("Both statements are true")
```



Thank You