## **Inheritance**

- · Child class inherits the methods and attributes of the parent class
- The child class can extend the init method of the parent class with super() function:

In the example below the Developer class EXTENDS the parent class Employee.

init method of the Developer class calls the init method in the parent class to instantiate the common variables between Employee and Developer class which are :

```
->name
```

->id

->pay

The variables which belong to ONLY class developer which are:

```
->dept
```

->prog\_lang

are initialized later.

```
class Employee:
1
2
     raise percent = 1.5
     def init (self,name,id,pay):
3
       self.name = name
4
5
       self.id = id
6
       self.pay = pay
7
8
     def apply raise(self):
9
       self.raise_amt = (self.raise_percent* self.pay)/100
10
       self.pay = int(self.pay + self.raise_amt)
11
       return self.pay
12
13
   class Developer(Employee): #inherits Employee class
14
15
     raise percent = 1.2
                               #class variable overloaded
     def __init__(self,name,id,pay,dept,prog_lang):
16
17
       super().__init__(name,id,pay) #calling init from parent class
18
       self.dept = dept
19
       self.prog_lang = prog_lang
```

Another class added that inherits the Employee class with its own set of methods:

```
1
   class Employee:
 2
      raise percent = 1.5
 3
      def init (self,name,id,pay):
 4
        self.name = name
 5
        self.id = id
 6
        self.pay = pay
 7
 8
     def apply raise(self):
 9
        self.raise_amt = (self.raise_percent* self.pay)/100
10
        self.pay = int(self.pay + self.raise_amt)
11
        return self.pay
12
13
14
   class Developer(Employee): #inherits Employee class
15
     raise_percent = 1.2
                                #class variable overloaded
16
     def init (self,name,id,pay,dept,prog lang):
17
        super(). init (name,id,pay) #calling init from parent class
18
        self.dept = dept
19
        self.prog_lang = prog_lang
20
21
22
   class Manager(Employee):
23
     def init (self,name,id,pay,dept,reportees=None):
24
        super().__init__(name,id,pay) #calling init from parent class
25
        self.dept = dept
        self.reportees = reportees
26
27
28
     def add new reportee(self,reporteelist):
29
        if reporteelist is None:
         return "Nothing to add"
30
31
        else:
          for reportee in reporteelist:
32
33
            self.reportees.append(reportee)
34
35
     def get reportee list(self):
36
        return self.reportees
37
38
   #create instance of Manager class
   mgr1 = Manager('Ben',100,100,'Retail',['a','b','c'])
40
   mgr1.add_new_reportee(['lisa','kyle'])
41
   print("Reportee list for manager: ", mgrl.get_reportee_list())
42
   print("\n\n")
43
44
   #create instance of Developer class
45
   dev1 = Developer('Mohima',100,100,'Retail','shell')
   print("Developer's pay: ", dev1.pay)
46
47
   print("Developer's pay after raise", dev1.apply_raise())
```

- Testing object class relationship-> is objectA an instance of Class B? -> isinstance()
- Testing parent child relationship between classes -> is class A child of subclass B? -> issubclass

```
1
   class Employee:
 2
      raise percent = 1.5
 3
     def init (self,name,id,pay):
 4
       self.name = name
 5
       self.id = id
 6
       self.pay = pay
 7
 8
9
   class Developer(Employee): #inherits Employee class
10
     raise_percent = 1.2
                               #class variable overloaded
     def __init__(self,name,id,pay,dept,prog_lang):
11
12
       super().__init__(name,id,pay) #calling init from parent class
13
       self.dept = dept
14
       self.prog_lang = prog_lang
15
16
17
   class Manager(Employee):
18
     def init (self,name,id,pay,dept,reportees=None):
19
       super().__init__(name,id,pay) #calling init from parent class
20
       self.dept = dept
21
       self.reportees = reportees
22
23
24
   #create instance of Manager class
25
   mgr1 = Manager('Ben',100,100,'Retail',['a','b','c'])
26
   #create instance of Developer class
27
28
   dev1 = Developer('Mohima',100,100,'Retail','shell')
29
30
   #isinstance
31
   print(isinstance(mgr1,Manager))
32
   print(isinstance(mgr1,Employee))
33
   print(isinstance(mgr1, Developer))
34
   print("*"*20,"\n")
35
36
37
   print(issubclass(Manager, Employee))
38
   print(issubclass(Manager, Developer))
39
   print(issubclass(Developer, Manager))
40
41
   OUTPUT
42
   True
   True
43
44
   False
45
   *******
46
47
   True
48
   False
49
   False
```