

Finals Task 2. Inheritance

Problem School Performance

Note: You are to create 4 separate python files for this task:

- performer.py(base class)
- singer.py(sub class)
- dancer.py(sub class)
- test_class.py – following the required test cases

In a school musical performance, different types of performers participate. For this program, we will be implementing the performers.

Base Class - Performer:

- Properties:
 - `name` (type: str): Represents the name of the performer.
 - `age` (type: int): Represents the age of the performer.
- Constructor:
 - `__init__(self, name: str, age: int)`: Initializes the `name` and `age` properties.
- Getters
 - `get_name(self) -> str`: Returns the name
 - `get_age(self) -> int`: Returns the age

Subclass - Singer:

- Inherits From: `Performer`
- Additional Property:
 - `vocal_range` (type: str): Represents the vocal range of the singer.
- Constructor:
 - `__init__(self, name: str, age: int, vocal_range: str)`: Initializes the `name` and `age` properties by calling the parent class's constructor and sets the `vocal_range` property.
- Getter:
 - `get_vocal_range(self) -> str`: Returns the vocal range of the singer.
- Method:
 - `sing(self) -> None`: Prints "{name} is singing with a {vocal_range} range."

Subclass - Dancer:

- Inherits From: **Performer**
- Additional Property:
 - **dance_style** (type: str): Represents the dance style of the dancer.
- Constructor:
 - **__init__(self, name: str, age: int, dance_style: str)**: Initializes the **name** and **age** properties by calling the parent class's constructor and sets the **dance_style** property.
- Getter:
 - **get_dance_style(self) -> str**: Returns the dance style of the dancer.
- Method:
 - **dance(self) -> None**: Prints "{name} is performing {dance_style} dance."

Sample output for the Test Class

Test Cases

Test case 1
Should return ['John', 25] when invoking the methods [get_name(), get_age()] of the Performer class with properties { Name: 'John' , Age: 25 }.

Test case 2
Should return ['Emily', 28, 'Ballet'] when invoking the methods [get_name(), get_age(), get_dance_style()] of the Dancer class with properties { Name: 'Emily' , Age: 28, Dance Style: 'Ballet' }.

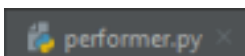
Test case 3
Should return 'Emily is performing Ballet dance.' when invoking the dance() method of the Dancer class with properties { Name: 'Emily' , Age: 28, Dance Style: 'Ballet' }.

Test case 4
Should make Dancer class a subclass of Performer class.

Test case 5
Should return ['Linda', 35, 'Soprano'] when invoking the methods [get_name(), get_age(), get_vocal_range()] of the Singer class with properties { Name: 'Linda' , Age: 35, Vocal Range: 'Soprano' }.

Test case 6
Should return 'Linda is singing with a Soprano range.' when invoking the sing() method of the Singer class with properties { Name: 'Linda' , Age: 35, Vocal Range: 'Soprano' }.

CODE:



```
class Performer:
    def __init__(self, name: str, age: int):
        self._name = name
        self._age = age
```

5 usages

```
def get_name(self) -> str:
    return self._name
```

3 usages

```
def get_age(self) -> int:
    return self._age
```

singer.py ×

```
from performer import Performer
```

2 usages

```
class Singer(Performer):
```

```
    def __init__(self, name: str, age: int, vocal_range: str):
        Performer.__init__(self, name, age)
        self._vocal_range = vocal_range
```

1 usage

```
def get_vocal_range(self) -> str:
    return self._vocal_range
```

1 usage

```
def sing(self) -> None:
```

```
    print(f"{self.get_name()} is singing with a {self._vocal_range} range.")
```

dancer.py ×

```

from performer import Performer

3 usages
class Dancer(Performer):
    def __init__(self, name: str, age: int, dance_style: str):
        Performer.__init__(self, name, age)
        self._dance_style = dance_style

1 usage
def get_dance_style(self) -> str:
    return self._dance_style

1 usage
def dance(self) -> None:
    print(f"{self.get_name()} is performing {self._dance_style} dance.")

```

test_class.py ×

```

from performer import Performer
from singer import Singer
from dancer import Dancer

performer = Performer(name="Justin", age=25)
print(performer.get_name(),
      performer.get_age())

dancer = Dancer(name="Emily", age=25, dance_style="Ballet")
print(dancer.get_name(),
      dancer.get_age(),
      dancer.get_dance_style())

dancer.dance()

print(issubclass(Dancer, Performer))

singer = Singer(name="Linda", age=35, vocal_range="Soprano")
print(singer.get_name(),
      singer.get_age(),
      singer.get_vocal_range())

singer.sing()

```

OUTPUT:

```
C:\Users\COMLAB\AppData\Local\Programs\Python\Python311\python.exe C:\Users\COMLAB\PycharmProjects\pythonProject\test_class.py
Justin 25
Emily 25 Ballet
Emily is performing Ballet dance.
True
Linda 35 Soprano
Linda is singing with a Soprano range.

Process finished with exit code 0
```