

설계패턴 4주차 실습

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LAB 1) – Prototype Pattern

```
import copy
import random

class Character:
    @staticmethod
    def generate_unique_id():
        new_id = random.randint(1, 100)
        while new_id in Character.generated_ids:
            new_id = random.randint(1, 100)
        Character.generated_ids.add(new_id)
        return new_id

    generated_ids = set()

    def __init__(self):
        self.health = 500
        self.defense = 100
        self.mana = 500
        self.magic = 100
        self.agility = 100
        self.range = 100
        self.skill = None
        self.name = None
        self.ID = self.generate_unique_id()

    def clone(self):
        cloned = copy.deepcopy(self)
        cloned.ID = self.generate_unique_id()
        return cloned

class Warrior(Character):
    def __init__(self):
        super().__init__()
        self.health = 1000
        self.defense = 500
        self.skill = "검 스윙"
```

```

class Wizard(Character):
    def __init__(self):
        super().__init__()
        self.mana = 1000
        self.magic = 500
        self.skill = "파이어 볼"

class Archer(Character):
    def __init__(self):
        super().__init__()
        self.agility = 500
        self.range = 300
        self.skill = "정밀 사격"

warrior = Warrior()
warrior_1 = warrior.clone()
warrior_1.name = "나는전사"
warrior_1.agility = 50
warrior_2 = warrior.clone()
warrior_2.name = "나도전사"

wizard = Wizard()
wizard_1 = wizard.clone()
wizard_1.name = "나는 마법사"
wizard_1.health = 550
wizard_2 = wizard.clone()
wizard_2.name = "나도 마법사"

archer = Archer()
archer_1 = archer.clone()
archer_1.name = "나는 궁수"
archer_1.mana = 50
archer_2 = archer.clone()
archer_2.name = "나도 궁수"

print("warrior 1 ", warrior_1.__dict__)
print("warrior 2 ", warrior_2.__dict__)
print("wizard 1 ", wizard_1.__dict__)
print("wizard 2 ", wizard_2.__dict__)
print("archer 1 ", archer_1.__dict__)
print("archer 2 ", archer_2.__dict__)

```

```

warrior 1 {'health': 1000, 'defense': 500, 'mana': 500, 'magic': 100, 'agility': 50, 'range': 100, 'skill': '검 스윙', 'name': '나는전사', 'ID': 18}
warrior 2 {'health': 1000, 'defense': 500, 'mana': 500, 'magic': 100, 'agility': 100, 'range': 100, 'skill': '검 스윙', 'name': '나도전사', 'ID': 25}
wizard 1 {'health': 550, 'defense': 100, 'mana': 1000, 'magic': 500, 'agility': 100, 'range': 100, 'skill': '파이어 볼', 'name': '나는 마법사', 'ID': 96}
wizard 2 {'health': 500, 'defense': 100, 'mana': 1000, 'magic': 500, 'agility': 100, 'range': 100, 'skill': '파이어 볼', 'name': '나도 마법사', 'ID': 50}
archer 1 {'health': 500, 'defense': 100, 'mana': 50, 'magic': 100, 'agility': 500, 'range': 300, 'skill': '정밀 사격', 'name': '나는 궁수', 'ID': 14}
archer 2 {'health': 500, 'defense': 100, 'mana': 500, 'magic': 100, 'agility': 500, 'range': 300, 'skill': '정밀 사격', 'name': '나도 궁수', 'ID': 71}

```

LAB 2) – Builder Pattern

```
class Character:
    def __init__(self):
        self.ID = None
        self.name = None
        self.health = 500
        self.defense = 100
        self.mana = 500
        self.magic = 100
        self.agility = 100
        self.range = 100
        self.skill = None

class CharacterBuilder:
    def __init__(self):
        self.character = Character()

    def set_name(self, name):
        self.character.name = name
        return self

    def set_health(self, health):
        self.character.health = health
        return self

    def set_defense(self, defense):
        self.character.defense = defense
        return self

    def set_mana(self, mana):
        self.character.mana = mana
        return self

    def set_magic(self, magic):
        self.character.magic = magic
        return self

    def set_agility(self, agility):
        self.character.agility = agility
        return self

    def set_range(self, range):
        self.character.range = range
        return self
```

```

def set_skill(self, skill):
    self.character.skill = skill
    return self

def generate_ID(self):
    self.character.ID = random.randint(1, 100)
    return self

def build(self):
    if not self.character.name:
        raise ValueError("Name must be set")
    if not self.character.ID:
        self.generate_ID()
    return self.character

class WarriorBuilder(CharacterBuilder):
    def __init__(self):
        super().__init__()
        self.character.skill = "검 스윙"
        self.character.health = 1000
        self.character.defense = 500

class WizardBuilder(CharacterBuilder):
    def __init__(self):
        super().__init__()
        self.character.skill = "파이어볼"
        self.character.mana = 1000
        self.character.magic = 500

class ArcherBuilder(CharacterBuilder):
    def __init__(self):
        super().__init__()
        self.character.skill = "정밀 사격"
        self.character.agility = 500
        self.character.range = 300

warrior_builder = WarriorBuilder()
warrior_1 = warrior_builder.set_name("나는 전사").build()
warrior_builder_2 = WarriorBuilder()
warrior_2 = warrior_builder_2.set_name("나도 전사").build()

wizard_builder = WizardBuilder()
wizard_1 = wizard_builder.set_name("나는 마법사").build()
wizard_builder_2 = WizardBuilder()
wizard_2 = wizard_builder_2.set_name("나도 마법사").build()

```

```

archer_builder = ArcherBuilder()
archer_1 = archer_builder.set_name("나는 궁수").build()
archer_builder_2 = ArcherBuilder()
archer_2 = archer_builder_2.set_name("나도 궁수").build()

print("warrior 1", warrior_1.__dict__)
print("warrior 2", warrior_2.__dict__)
print("wizard 1", wizard_1.__dict__)
print("wizard 2", wizard_2.__dict__)
print("archer 1", archer_1.__dict__)
print("archer 2", archer_2.__dict__)

```

```

warrior 1 {'ID': 60, 'name': '나는 전사', 'health': 1000, 'defense': 500, 'mana': 500, 'magic': 100, 'agility': 100, 'range': 100, 'skill': '검 스윙'}
warrior 2 {'ID': 96, 'name': '나도 전사', 'health': 1000, 'defense': 500, 'mana': 500, 'magic': 100, 'agility': 100, 'range': 100, 'skill': '검 스윙'}
wizard 1 {'ID': 4, 'name': '나는 마법사', 'health': 500, 'defense': 100, 'mana': 1000, 'magic': 500, 'agility': 100, 'range': 100, 'skill': '파이어볼'}
wizard 2 {'ID': 70, 'name': '나도 마법사', 'health': 500, 'defense': 100, 'mana': 1000, 'magic': 500, 'agility': 100, 'range': 100, 'skill': '파이어볼'}
archer 1 {'ID': 79, 'name': '나는 궁수', 'health': 500, 'defense': 100, 'mana': 500, 'magic': 100, 'agility': 500, 'range': 300, 'skill': '정밀 사격'}
archer 2 {'ID': 68, 'name': '나도 궁수', 'health': 500, 'defense': 100, 'mana': 500, 'magic': 100, 'agility': 500, 'range': 300, 'skill': '정밀 사격'}

```