

CPIT252 – LAB4 – BUILDER DESIGN PATTERN

First:

the test class contains errors so there isn't a "before screenshot for the Junit test"

Second:

Let's start with the easy stuff

- I did compare the classes of the three characters (Knight, Archer, FlagBearer) and noticed that the "Archer" didn't implement the methods on the interface, so I did implement them, and I've added the toString() method just like the "Knight" & "FlagBearer" although that the auto generation didn't implement it.
- I also modified the constructor based on the other classes constructors and I've put the style (Skintone,, etc.) based on what I've seen on the output. At the end of the lab class. And this is the result in "Archer" class,

```
8      public Archer(String name) {
9          if (name == null) {
10             throw new IllegalArgumentException("Character must have a name");
11         }
12         // TODO: instantiate an avatar builder using Avatar.Builder
13         this.name = name;
14         this.avatar = new Avatar.Builder(SkinTone.FAIR).withHairColor(HairColor.BLOND).withHairType(HairType.LONG_STRAIGHT)
15             .withBodyType(BodyType.FIT).withFacialFeatures(FacialFeatures.CLEAN_SHAVEN)
16             .build();
17     }
18
19     @Override
20     public String getName() { return name; }
21
22
23     @Override
24     public void setName(String name) { this.name = name; }
25
26
27
28     @Override
29     public Avatar getAvatar() { return avatar; }
30
31
32
33     @Override
34     public void setAvatar(Avatar avatar) { this.avatar = avatar; }
35
36
37 }
38
```

CPIT252 – LAB4 – BUILDER DESIGN PATTERN

Third:

I've created a switch to choose between character names in "CharacterFactory" class

```
5 public class CharacterFactory {
6     // TODO: Add a factory method that returns an object (Archer, FlagBearer, or Knight) by its name:
7     @ public static Characters createCharacter(CharacterTypes type, String name){
8         switch (type) {
9             case ARCHER:
10                 return new Archer(name);
11             case FLAG_BEARER:
12                 return new FlagBearer(name);
13             case KNIGHT:
14                 return new Knight(name);
15             default:
16                 return null;
17         }
18     }
19 }
```

Forth:

In "avatar" class I had to

- **First:** modify the constructor

```
private Avatar(Builder builder) {
    //TODO: initialize using the builder nested class
    this.body = builder.body;
    this.face = builder.face;
    this.tone = builder.tone;
    this.hairColor = builder.hairColor;
    this.hairType = builder.hairType;
}
```

CPIT252 – LAB4 – BUILDER DESIGN PATTERN

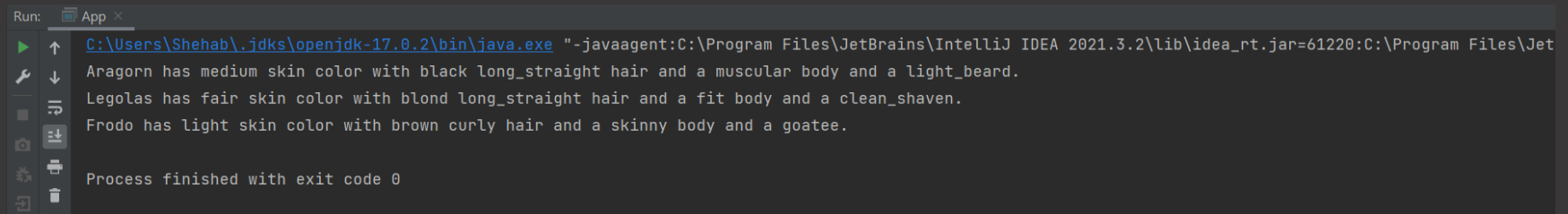
- **Second:** create the the methods (withHairColor, withBodyType, withFacialFeatures, withHairType) inside the innerclass ("Build")
- **Third:** modifying build(), having the following result

```
89
90     public Builder withHairType(HairType hairType) {
91         this.hairType = hairType;
92         return this;
93     }
94     public Builder withFacialFeatures(FacialFeatures facialFeatures) {
95         this.face = facialFeatures;
96         return this;
97     }
98     public Builder withBodyType(BodyType bodyType) {
99         this.body = bodyType;
100        return this;
101    }
102    public Builder withHairColor(HairColor hairColor) {
103        this.hairColor = hairColor;
104        return this;
105    }
106    // TODO: Add with withHairColor, withBodyType, withFacialFeatures
107    public Avatar build() {
108        return new Avatar( builder: this);
109    }
110 }
111 }
```

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Fifth:

This is the final output with the Junit test



```
Run: App ×
C:\Users\Shehab\.jdk\openjdk-17.0.2\bin\java.exe "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA 2021.3.2\lib\idea_rt.jar=61220:C:\Program Files\Jet
Aragorn has medium skin color with black long_straight hair and a muscular body and a light_beard.
Legolas has fair skin color with blond long_straight hair and a fit body and a clean_shaven.
Frodo has light skin color with brown curly hair and a skinny body and a goatee.

Process finished with exit code 0
```

✓ Tests passed: 1 of 1 test – 18 ms

C:\Users\Shehab\.jdk\openjdk-17.0.2\bin\java.exe ...

Process finished with exit code 0