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Clean Code:

A Handbook of Agile Software Craftsmanship

Chapter 02: Meaningful Names

Meaningful names characteristics:

Name of the classes, methods and variables must have some characteristics to make it easier to understand the code. In this chapter we will learn a few of them.

Meaningful names characteristics:

- 1. The name should be intension-revealing.
 - What is the purpose behind this element of code? (method, object, variable, ...)
 - What was the author of the code thinking about and what was he looking for?
 - What is this module supposed to do?

The name should be chosen in such way that no comments or documents are required to answer these questions. Name of the element should answer all the big questions. If a name needs comment, it doesn't reveal its intent.



private void changeColorOfText()



private void changeColorOfTextOnMouseClick()



- 2. The name should not give dis-information.
 - Using names that may mislead the reader, will take more time to understand the code. Or even take his mind towards another concept with a similar name, or hide the meaning of the code. Some possible situations:
 - Using the name hp as the acronym of hypotenuse.
 - Using the name accountList while its type is not List. Instead we can use accountGroup, bunchOfAccountsor even accounts.
 - Using long similar names like XYZControllerForEfficientHandlingOfStrings and XYZControllerForEfficientStorageOfStrings.
 - Using the letters 0 and I along side with the numbers 0 and 1.





```
String indexSequel = "1,2,3";
List<Integer> indexList = List.of(1, 2, 3);
```



- 3. The name should make meaningful distinctions.
 - We should pick a name for code elements in such way to differ them easily, no matter how much they are alike. Some examples:
 - The names in a scope, or method arguments should not be singular letter and similar, like they are only to satisfy the compiler. The reader should not be forced to read the algorithm to understand the intention of the variable.
 - Three classes named Product, ProductInfo and ProductData. What is the intention behind each one?
 - Using words like variable, method or class for naming.





public void copyChars(char a1[], char a2[])





public void copyChars(char source[], char destination[])



Meaningful names characteristics:

4. The name should be pronounceable.

Maybe using bthymdh as a variable name look like a good decision as the acronym of birthdayYearMonthDayHour in the first look. But every time you want to read this part of code you will be forced to wait for a few seconds so you could understand and read this variable.

Meaningful names characteristics:



String cstmrNm = "Mohammadmahdi Farrokhy";
String cstmrNm = "";





String customerName = "Mohammadmahdi Farrokhy";
String customerName = "";



- 5. The name should be searchable.
 - Using singular letter variables or constant numbers will make it difficult to find them in code with the eye quickly.
 - Variable names should be more than 3 characters long.
 - Constant numbers should be stored in a final variable and use the variable where needed.

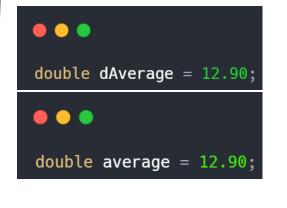
```
int s = 0;
for (int j = 0; j < 34; j++)
    s += (t[j] * 4) / 5;</pre>
```



```
int realDaysPerIdealDay = 4;
final int NUMBER_OF_TASKS = 34;
final int WORK_DAYS_PER_WEEK = 5;
int sum = 0;
for (int taskNum = 0; taskNum < NUMBER_OF_TASKS; taskNum++) {
   int realTaskDays = taskEstimate[taskNum] * realDaysPerIdealDay;
   int realTaskWeeks = realTaskDays / WORK_DAYS_PER_WEAK;
   sum += realTaskWeeks;
}</pre>
```



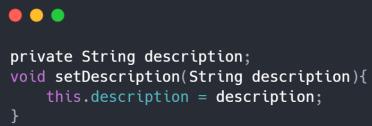
- 6. The name should avoid encoding.
 - The code is complex by itself. So we don't need extra complexity caused by encoded names. Suh as:
 - Names with member prefix: m_{_} is a sign of class members used in old IDEs. Today this kind of names are obsolete.
 - Hungarian notation: It was used in the old IDEs where there was a distance between object declaration and its usage; and the programmer wanted to remember the object type.





```
private String m_dsc;
void setDescription(String description){
   m_dsc = description;
}
```







Meaningful names characteristics:

7. The name of **interfaces** and their implementor **classes**.

Don't use I at the beginning of an interface name. Instead write a C at the beginning or Impl at the end of its implementor classes.



```
public interface IShapeFactory{
public class ShapeFactory implements IShapeFactory{
public interface ShapeFactory{
public class CShapeFactory implements ShapeFactory{
public class ShapeFactoryImpl implements ShapeFactory{
```





- 8. The name of classes:
 - It should be noun or noun phrase like Customer, Account and AddressParser.
 - It should not contain general words like Manager, Processor, Data or Infothat indicate a big variety of tasks and do not reveal the true functionality of the class.



```
public class OrderManager{
public class CreateShape{
```



```
public class OrderSorter{
public class ShapeCreator{
```



- 9. The name of **methods**:
 - It should be verb or verb phrase like deletePage, calculateDistance and postPayment.
 - Setter methods should start with set.
 - Getter methods should start with get.
 - Boolean methods should start with is.

```
private int age;
public void initAge(int age) {
    this.age = age;
public int age() {
    return age;
public boolean adultOrNot() {
    return age > 18;
```



```
private int age;
public void setAge(int age) {
    this.age = age;
public int getAge() {
    return age;
public boolean isAdult() {
    return age > 18;
```

Meaningful names characteristics:

10. Use one word for one concept.

If you once used insert as a keyword for adding a new element to a collection, use **insert** for any situation you add a new element to a collection. If you once used getas a keyword for getting an existing element in a collection, use **get** for any situation you get an existing element in a collection.

```
public Integer getAgeFromList(List<Integer> ageList){
}

public String readNameFromList(List<String> nameList){
}
```



```
public Integer getAgeFromList(List<Integer> ageList){
}

public String getNameFromList(List<String> nameList){
}
```



Meaningful names characteristics:

11. Use solution domain names.

It is better to use computer science terms, design patterns and algorithms names instead of using the problem domain names all the time. Using problem domain names requires the presence of a domain expert.

12. But if you have access to the domain expert, choosing problem domain names can be a good decision.



```
// Factory Design Pattern
public class CircleCreator{
}
public class RectangleCreator{
}
```



```
// Factory Design Pattern
public class CircleFactory{
}

public class RectangleFactory{
}
```





13. Add meaningful context.

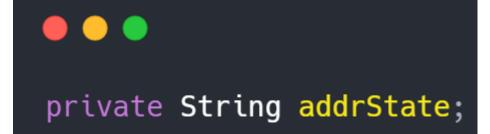
Some names may be ambiguous by themselves. Adding a meaningful context can clear the naming.





private String state;









14. Don't add gratuitous context.

Some prefixes or postfixes only add more complexity. Imagine adding per at the beginning of every property name in class Person. By writing per the IDE suggests too many different objects and it confuses us.

```
public class Person{
   private String perFirstName;
   private String perLastName;
   private int perAge;
   private Address perAddress;
}
```



```
public class Person{
   private String firstName;
   private String lastName;
   private int age;
   private Address address;
```



In brief meaningful name has these features:

- The name is not dis-informative.
- The name doesn't remind the reader of another concept.
- The name doesn't need comments to be understood.
- The name reveals the author's intentions.
- The names of the classes, objects and variables are nouns or noun phrases.
- The names of the methods are verbs or verb phrases.
- The names of the enums are adjectives.
- The names of the packages are nouns or noun phrases.
- There is a semantic continuity between name of the class with its methods and properties.
- There is no similar and duplicated names.
- The more the distance of a variable's declaration and usage, the longer its name.
- The more publica method, the more general its task and the shorter its name.