**Lab: Reflection**

Problems for exercises and homework for the ["CSharp HYPERLINK "https://softuni.bg/trainings/1637/c-sharp-oop-advanced-july-2017" OOP Advanced" course @ SoftUni.](https://softuni.bg/trainings/1637/c-sharp-oop-advanced-july-2017)

You can check your solutions here: <https://judge.softuni.bg/Contests/710/Reflection-Lab>

* **Stealer**

Add the Hacker class from the box below to your project.

|  |
| --- |
| **Hacker.cs** |
| public class Hacker  {  public string username = "securityGod82";  private string password = "mySuperSecretPassw0rd";  public string Password  {  get => this.password;  set => this.password = value;  }  private int Id { get; set; }  public double BankAccountBalance { get; private set; }  public void DownloadAllBankAccountsInTheWorld()  {  }  } |

There is one really nasty hacker but not so wise though. He is trying to steal a big amount of money and transfer it to his own account. The police is after him but they need a proffessional… Correct - this is you!

You have the information that this hacker is keeping some of his info in private fields. Create a new class named **Spy** and add inside a method called - **StealFieldInfo** which receives:

* stirng - name of the class to investigate
* array of string - names of the filds to investigate

After finding the fields you must print on the console:

“Class under investigation: **{nameOfTheClass}**”

On the next lines print info about each field in the current format:

“**{filedName}** = **{fieldValue}**”

Use **StringBuilder** to concatenate the answer**. Don’t change anything in "Hacker" class!**

In your main Method you should be able to check your program with the current piece of code.



**Example**

|  |
| --- |
| **Output** |
| Class under investigation: Hacker  username = securityGod82  password = mySuperSecretPassw0rd |

**Solution**



* **High Quality Mistakes**

You are already expert of **High Quality Code**, so you know what kind of **access modifiers** must be set to members of class. You should have noticed our hacker is not familiar with these concepts.

Create a method inside your Spy class called - **AnalyzeAcessModifiers(stirng className)**. Check all **fields and methods access modifiers**. Print on console all **mistakes** in format:

* Fields
* **{fieldName} must be private!**
* Getters
* **{methodName} have to be public!**
* Setters
* **{methodName} have to be private!**

Use **StringBuilder** to concatenate the answer**. Don’t change anything in "Hacker" class!**

In your main Method you should be able to check your program with the current piece of code.



**Example**

|  |
| --- |
| **Output** |
| username must be private!  get\_Id have to be public!  set\_Password have to be private! |

**Solution**



* **Mission Private Impossible**

It’s time to see what this hacker you are dealing with aims to do. Create a method inside your Spy class called - **RevealPrivateMethods(stirng className)**. Print all private methods in the following format:

All Private Methods of Class: **{className}**

Base Class: **{baseClassName}**

On the next lines print found method’s names each on new line

Use **StringBuilder** to concatenate the answer**. Don’t change anything in "Hacker" class!**

In your main Method you should be able to check your program with the current piece of code.



**Example**

|  |
| --- |
| **Output** |
| All Private Methods of Class: Hacker  Base Class: Object  get\_Id  set\_Id  set\_BankAccountBalance  Finalize  MemberwiseClone |

**Solution**



* **Collector**

Using reflection to get all "Hacker" methods. Then prepare algorithm that will recognize, which methods are getters and setters.

Print to console each getter on new line in format:

**{name} will return {Return Type}**

Then print all setters in format:

**{name} will set field of {Parameter Type}**

Use **StringBuilder** to concatenate the answer**. Don’t change anything in "Hacker" class!**

In your main Method you should be able to check your program with the current piece of code.



**Example**

|  |
| --- |
| **Output** |
| get\_Password will return System.String  get\_Id will return System.Int32  get\_BankAccountBalance will return System.Double  set\_Password will set field of System.String  set\_Id will set field of System.Int32  set\_BankAccountBalance will set field of System.Double |

**Solution**

