

[Youtube Live]

객체 지향 프로그래밍의 시작 - 객체를 활용한 MATLAB 프로그래밍

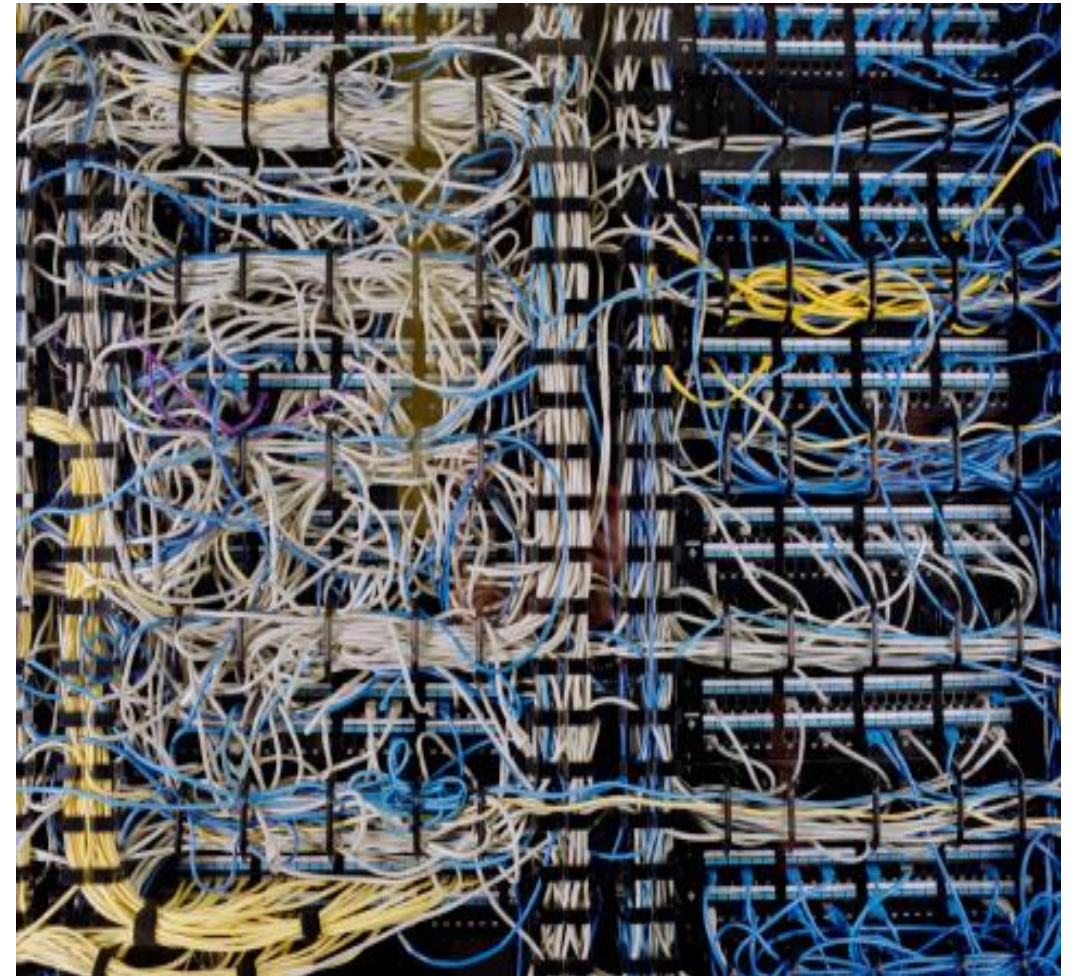
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Agenda

- MATLAB 에서의 객체 필요성
- Class 정의와 Object 생성
- Package folder의 활용

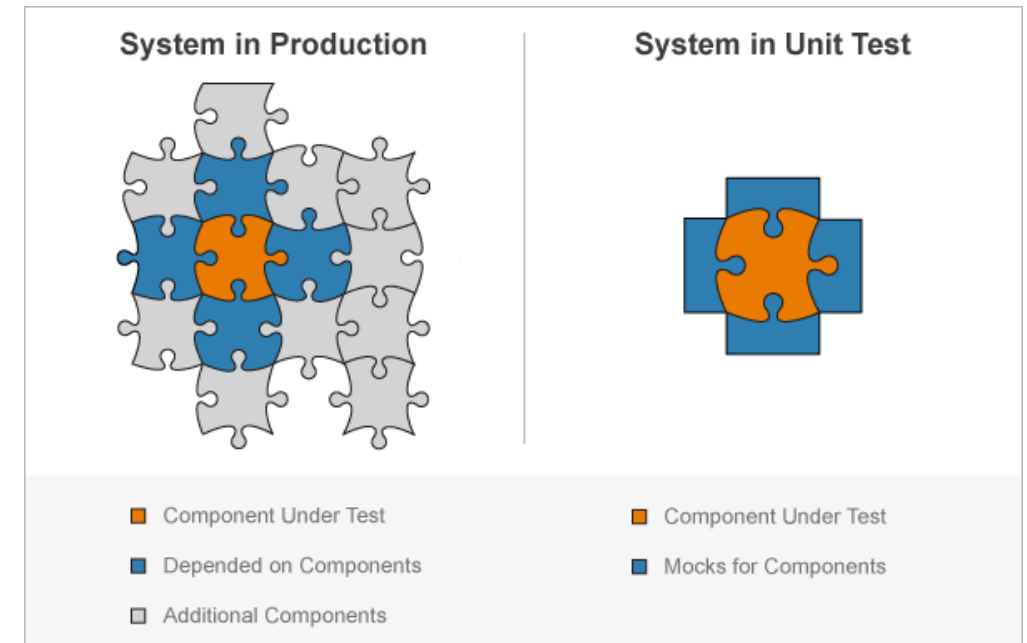
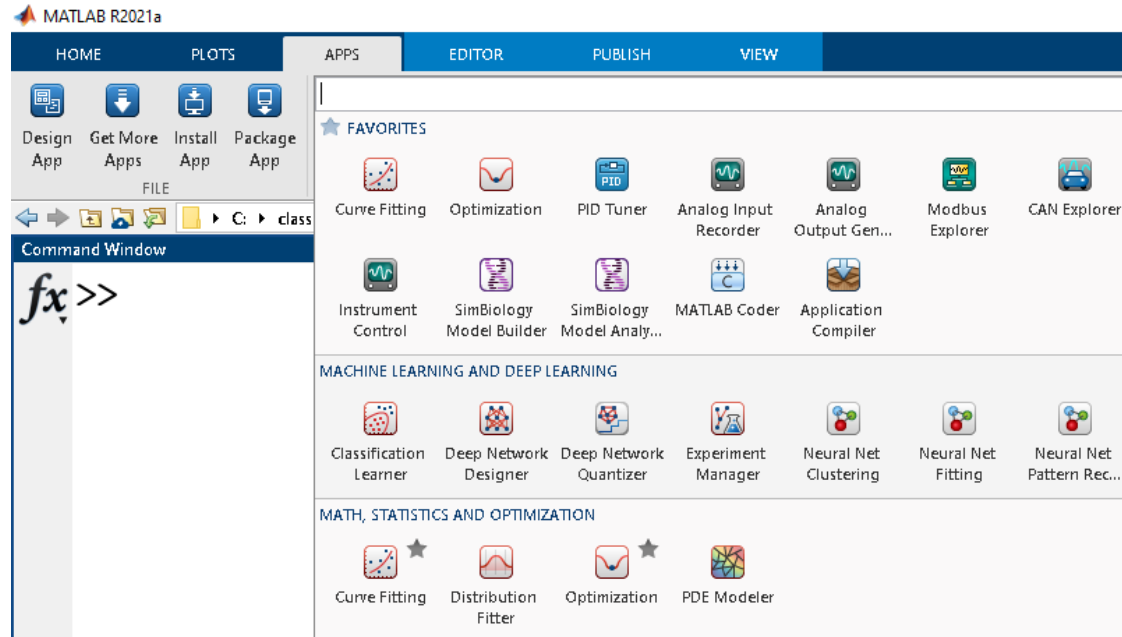
Why or When Use Object-Oriented Design

“작업의 규모와 복잡도가 증가할수록 함수도 더 복잡해지고 관리하기 어려워집니다. 함수가 너무 커지면 크기가 작은 여러 함수로 나누고 함수 간에 데이터를 전달하는 방법이 있습니다. 하지만 함수 개수가 많아지면 함수에 전달되는 데이터를 설계하고 관리하는 일이 더 어려워지고 오류가 발생하기 쉬워집니다.”



Where Use Object-Oriented Design

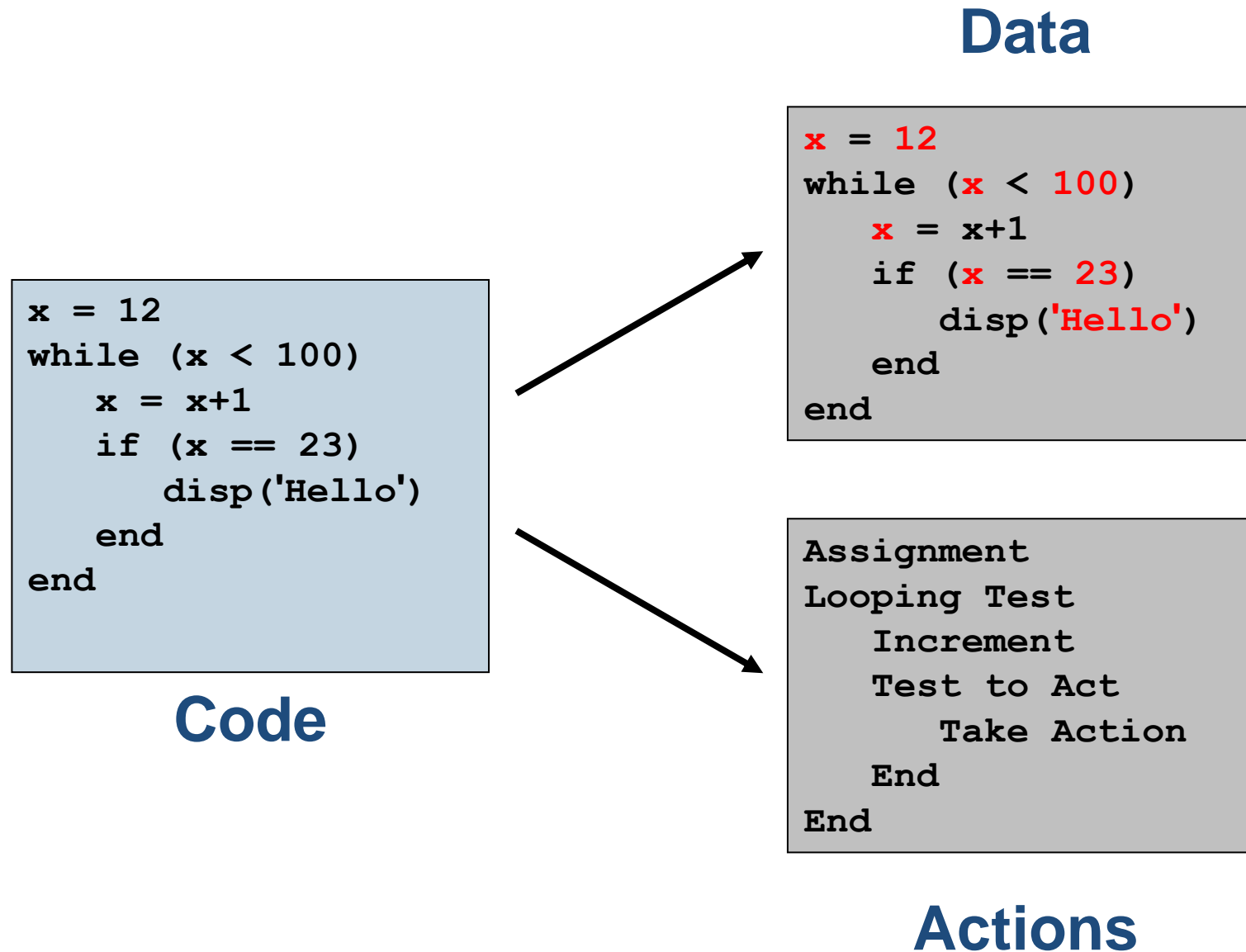
Workspace		
Name	Class	Size
var1	double	1x1
var2	struct	1x1
var3	Custom_Type_of_MATLAB	1x1



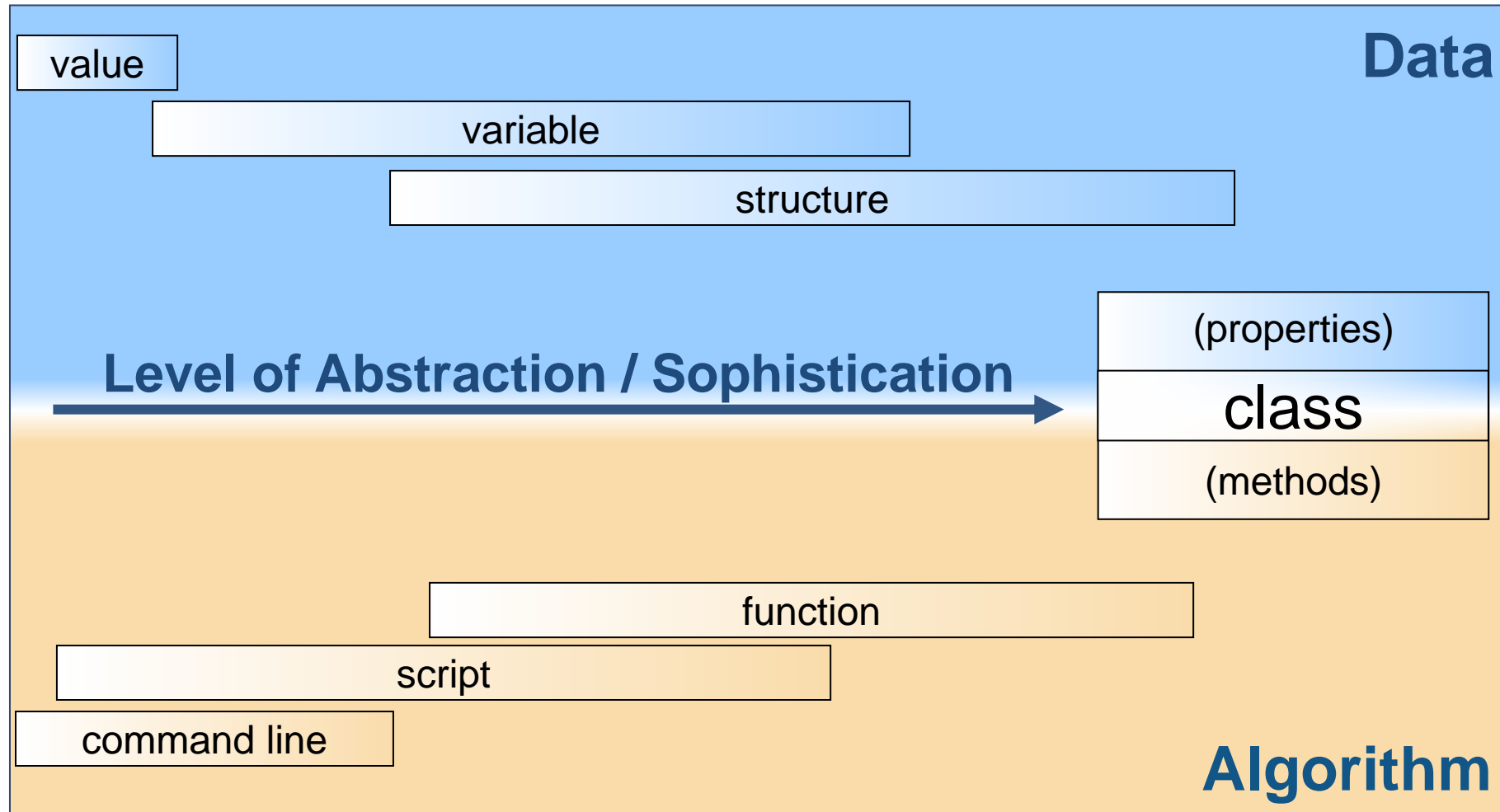
User Stories

- **Shell Geologists Develop and Deploy Software for Predicting Subsurface Geologic Features**
 - First, they rewrote some of the procedural MATLAB code, applying object-oriented principles to make the code easier to extend and maintain.
- **Trient Develops Financial Analytics Platform to Support Its Investment Team**
 - Object-oriented programming in MATLAB enabled us to write less error-prone code, define reusable interfaces, and make rapid updates.
- **Bosch Develops a Single Platform for Automotive Test Data Analysis and Visualization**
 - The team used the object-oriented programming capabilities of the MATLAB language to simplify ongoing maintenance tasks, including the creation of more than 250 class definition files for the complete application.

What is a program?



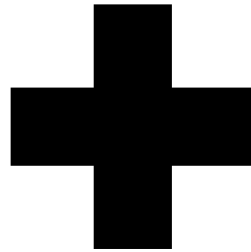
Progression of Programming Techniques



Class

KBOteam1

Name	'LG'
Win	79
Loss	61



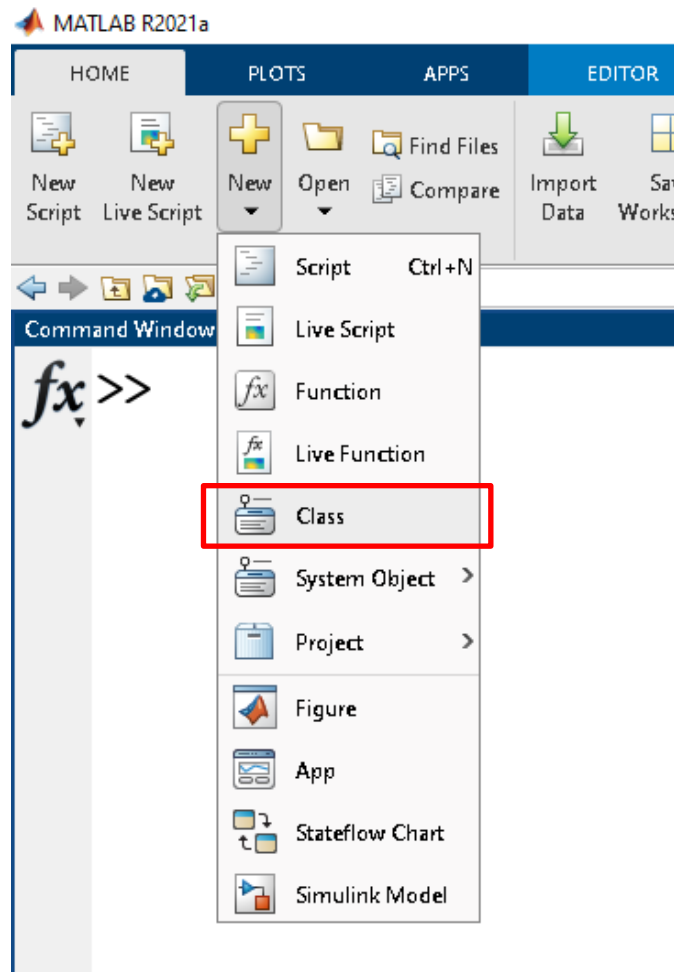
```
function wp = winrate(Win , Loss)
wp = Win/(Win+Loss);
disp([Name '의 승률은 ' num2str(wp) ' 입니다.'])
end
```

```
function wlm = wlmargin(Win , Loss)
wlm = Win - Loss;
disp([Name '의 승패마진은 ' num2str(wlm) ' 입니다.'])
end
```

- Abstraction
- Inheritance

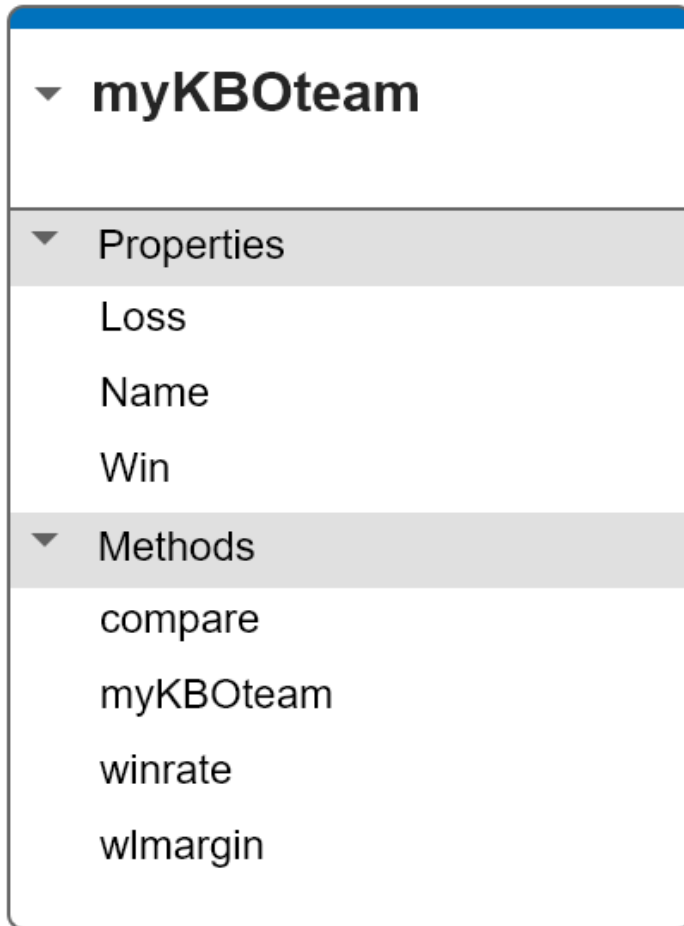
- Encapsulation
- Polymorphism

How to make a class definition file



```
Editor - Untitled*
Untitled* x +
1  classdef untitled
2      %UNTITLED Summary of this class goes here %...%
4
5      properties
6          Property1
7      end
9      methods
10         function obj = untitled(inputArg1, inputArg2)
11             %UNTITLED Construct an instance of this class %...%
12             obj.Property1 = inputArg1 + inputArg2;
13         end
14
15         function outputArg = method1(obj, inputArg)
16             %METHOD1 Summary of this method goes here %...%
17             outputArg = obj.Property1 + inputArg;
18         end
19     end
20 end
21 end
22 end
```

Demo : KBO data Class



- 야구팀의 승패 데이터를 가지고 승률과 승패마진을 계산할 수 있습니다.
- 팀 간의 승률을 비교 할 수 있습니다.

Package 폴더의 활용

Folders start with '+'

How to use

```
>> obj = PackageName.ClassName
```

Or

```
>> import PackageName.*
```

```
>> obj = ClassName
```

▼ myKBOteam Y2020	
▼ Properties	
Loss	
Name	
Win	
▼ Methods	
compare	
myKBOteam	
winrate	
wlmargin	

▼ myKBOteam Y2021	
▼ Properties	
Draw	
Loss	
Name	
Win	
▼ Methods	
compare	
myKBOteam	
winrate	
wlmargin	

MathWorks Training

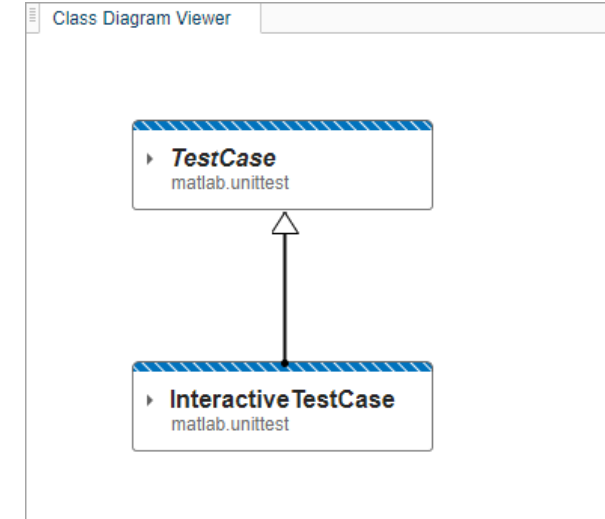
- [MATLAB Programming Techniques](#)

Types of Functions

There are several types of functions available with MATLAB®

- **Anonymous Functions**
- **Local Functions**
- **Nested Functions**
- **Private Functions**

- [Object-Oriented Programming with MATLAB](#)



Q & A