2024

Clean Code

Disminuyendo la carga cognitiva del código

¿Quién soy?

- Leonardo Micheloni
- Programador +20 años
- Microsoft MVP 9 años
- CSM desde 2012
- Arquitecto y tech lead en Tokiota Madrid

@leomicheloni

Sponsors

NTT DATA

plain concepts

intelequia

prodware

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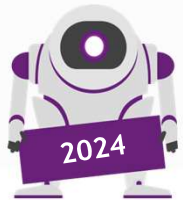
ilitia

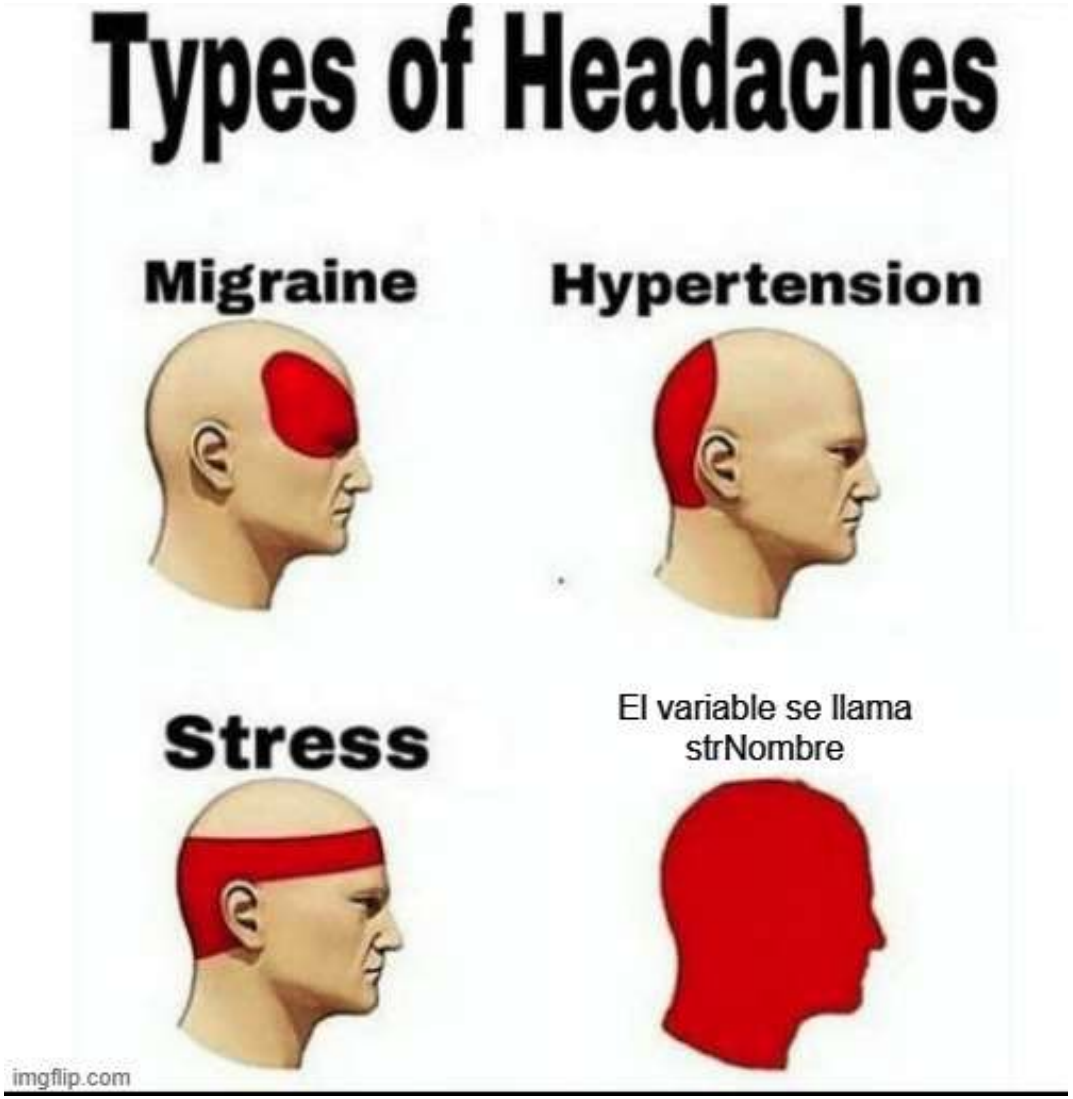


#netcoreconf

¿Disminuir la carga cognitiva del código?

- Detenernos a pesar qué hace un if
- Nos cuesta encontrar el código que buscamos
- No notar claramente la intención de una función

- Nos vamos cansando de analizar
- Nos perdemos con facilidad
- Odiamos todo


Types of Headaches
Migraine
Hypertension
Stress
El variable se llama
strNombre
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Agenda

01 DRY - KISS - YAGNI

02 NAMING

03 CONDICIONALES

04 FUNCIONES

05 COMENTARIOS

06 ALGUNA COSA MÁS


Contenido de la charla
CÓDIGO SIN CONTEXTO
REFLEXIONES
AI
HERRAMIENTAS DE MODA
MEMES

Title Example

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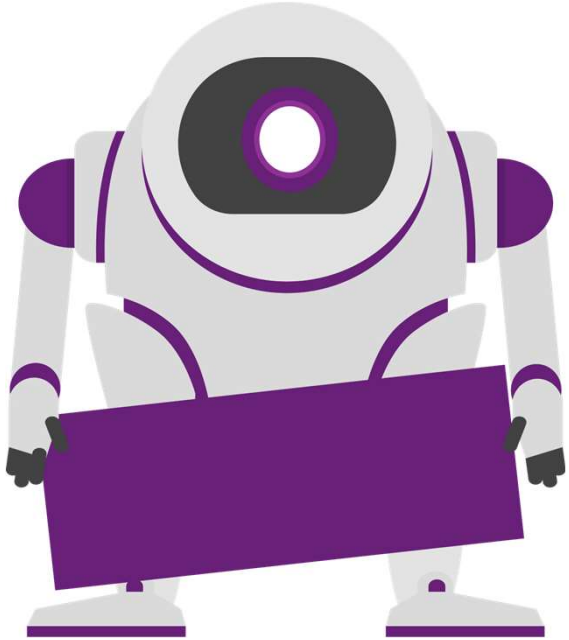

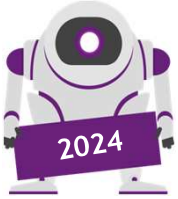

#netcoreconf

Title example

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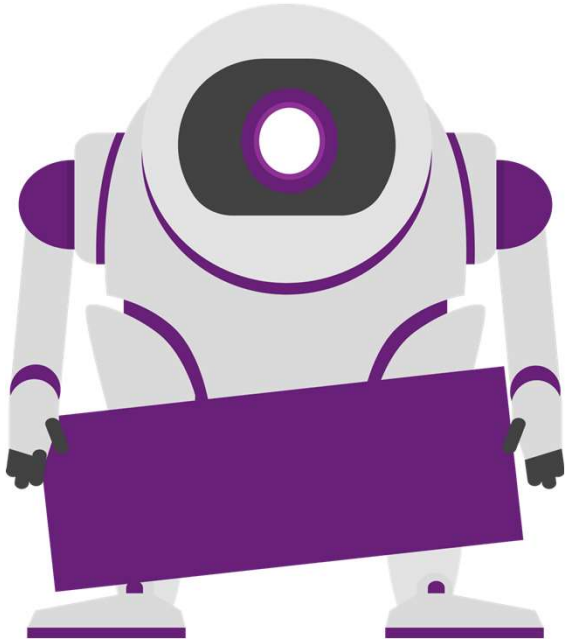
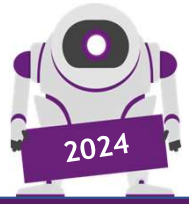
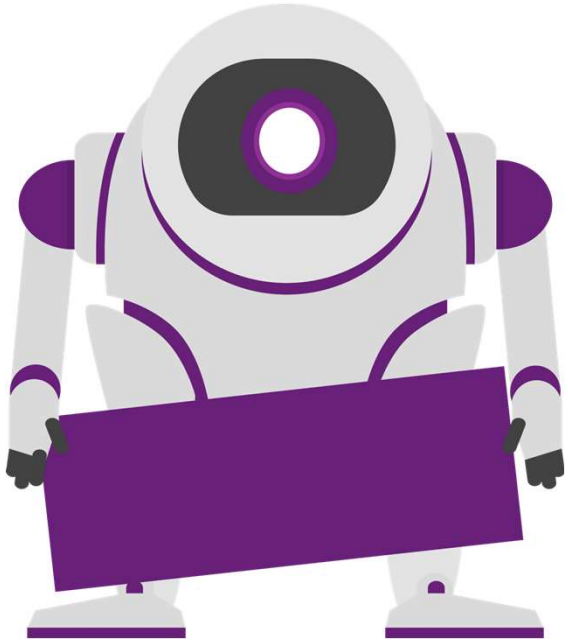
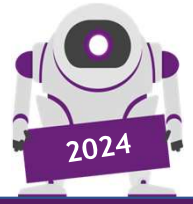




¿Por qué son importantes estos conceptos?

- Un framework / lenguaje / library no es más que una herramienta
- Se habla de ser bueno usando x pero no de ser buen programador
- Es cada vez más común mezclar tecnologías y herramientas
- Las aplicaciones evolucionan cada vez más rápido
- No siempre somos nosotros quienes comenzamos el código

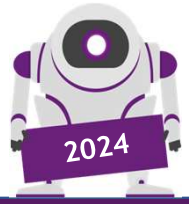


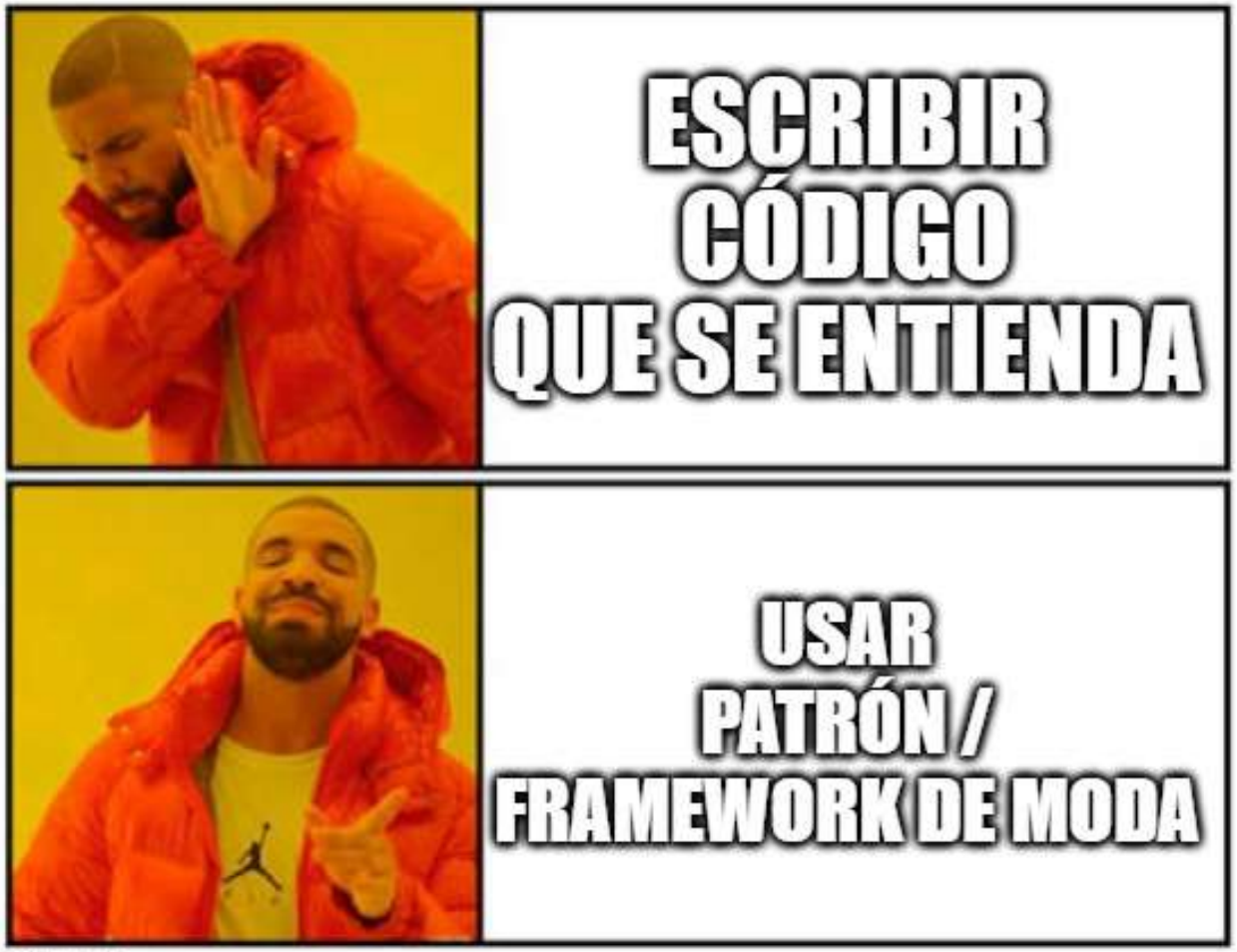


"Any fool can write code that a computer can understand. Good programmers write code that humans can understand."

Martin Fowler

No es Martin Fowler

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CÓDIGO
QUE SE ENTIENDA
USAR
PATRÓN /
FRAMEWORK DE MODA
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DRY

- **Don’t repeat yourself principle**
- Es similar a la normalización de bases de datos
- Copy + Paste oriented programming
- Hay más líneas de código para mantener

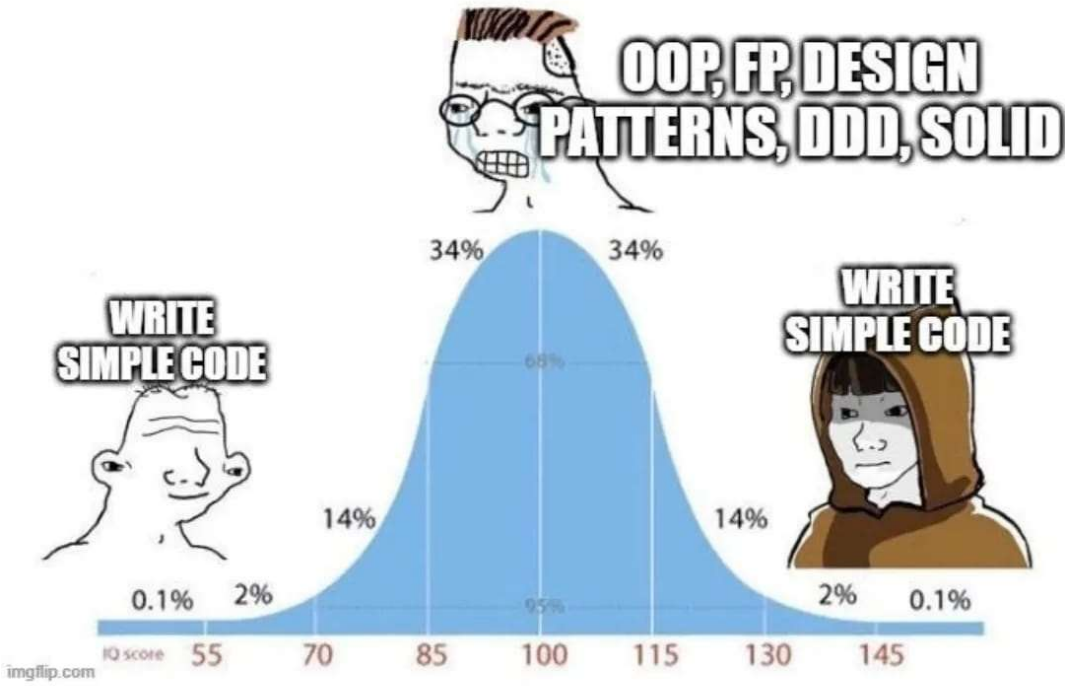
- Peeero..

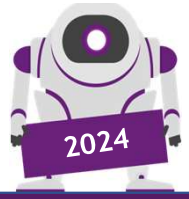
KISS

- **Keep it simple stupid**
- Hay un momento en nuestra evolución que nos gusta ser complicados
- La simplicidad es belleza

YAGNI

- **You ain’t gonna need it**
- Voy a hacer tal cosa por las dudas
- No se extremistas






```cs
using System;
using System.Threading;
using System.Threading.Tasks;
using MediatR;

namespace SaludoGlobalizado
{
    // Definimos una interfaz para la abstracción del lo
    4 references
    public interface ILogService
    {
        3 references
        Task LogAsync(string mensaje);
    }

    // Implementación concreta del servicio de log
    1 reference
    public class ConsoleLogService : ILogService
    {
        3 references
        public async Task LogAsync(string mensaje)
        {
            await Task.Run(() => Console.WriteLine($"[LOG]: {mensaje}"));
        }
    }

    // Definimos un comando para solicitar el saludo en un idioma específico
    3 references
    public class ObtenerSaludoCommand : IRequest<string>
    {
        2 references
        public string Idioma { get; set; }
    }

    // Manejador para el comando de obtener saludo
    3 references
    public class ObtenerSaludoCommandHandler : IRequestHandler<ObtenerSaludoCommand, string>
    {
        3 references
        private readonly ILogService _logService;

        1 reference
        public ObtenerSaludoCommandHandler(ILogService logService)
        {
            _logService = logService;
        }

        0 references
        public async Task<string> Handle(ObtenerSaludoCommand request, CancellationToken cancellationToken)
        {
            var idiomaEncontrado = ObtenerIdioma(request.Idioma);
            if (idiomaEncontrado != null)
            {
                await _logService.LogAsync($"Saludo en {idiomaEncontrado.Nombre}: {idiomaEncontrado.Saludo}");
                return idiomaEncontrado.Saludo;
            }
            else
            {
                await _logService.LogAsync("No se encontró el idioma especificado.");
                return "No se encontró el idioma especificado.";
            }
        }

        private Idioma ObtenerIdioma(string idioma)
        {
            // Implementación ficticia para obtener el idioma (similar a la versión anterior)
            return idioma.Equals("Inglés", StringComparison.OrdinalIgnoreCase)
                ? new Idioma { Nombre = "Inglés", Saludo = "Hello, World!" }
                : idioma.Equals("Español", StringComparison.OrdinalIgnoreCase)
                    ? new Idioma { Nombre = "Español", Saludo = "¡Hola, Mundo!" }
                    : null;
        }
    }

    // Configuración y ejecución
    0 references
    class Program
    {
        0 references
        static async Task Main(string[] args)
        {
            // Creamos una instancia del servicio de log
            var logService = new ConsoleLogService();

            // Configuramos MediatR con un service locator
            var mediator = ConfigureMediator(logService);

            // Solicitamos el saludo en un idioma específico (por ejemplo, inglés)
            var idiomaElegido = "Inglés";
            var saludo = await mediator.Send(new ObtenerSaludoCommand { Idioma = idiomaElegido });

            // No necesitamos Console.WriteLine aquí, ya que el log se maneja internamente
        }

        // Configuración de MediatR con un service locator
        1 reference
        static IMediator ConfigureMediator(ILogService logService)
        {
            var serviceFactory = new ServiceFactory(type =>
            {
                if (type == typeof(ObtenerSaludoCommandHandler))
                    return new ObtenerSaludoCommandHandler(logService);

                // Agrega más manejadores aquí si es necesario

                throw new InvalidOperationException($"Manejador no registrado para {type}");
            });

            return new Mediator(serviceFactory);
        }
    }
}
```

Simple, direct, prose

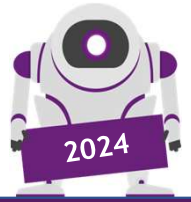
Clean code is simple
and direct

Clean code reads like
well-written prose

Grady Booch

Code Smells

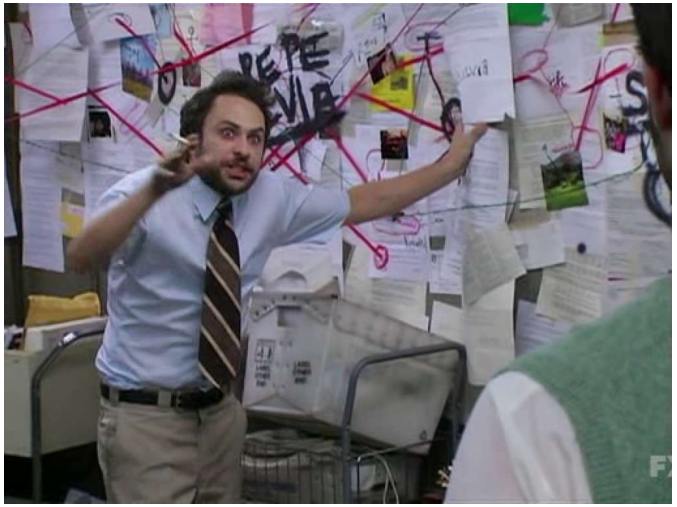
- Olores de código
- Indican que el código tiene potenciales problemas
  - Para ser mantenido
  - Para escalar
  - Para evolucionar
- Es propenso a errores



Naming

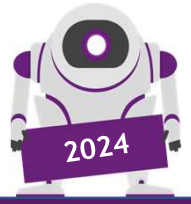
Clean code: Naming

- Deben ser claros en su intención
- Deben indicar responsabilidad única
- No deben tener prefijos o subfijos
- Las variables booleanas deben responder preguntas positivas



Clean code: Naming

- Smells
  - AND OR IF
  - El código tiene “side effects”
  - Tipos de datos en el nombre
  - Booleanos que no responden una pregunta
  - Variables o métodos que no son simétricos
  - Funciones con efectos secundarios no descriptos por su nombre
  - Las propiedades de un objeto comienzan por el nombre del objeto



Naming intention

```
//// Naming intention
// Mal
string d = DateTime.Now.ToString("yyyy/MM/dd");
// bien
string currentDate = DateTime.Now.ToString("yyyy/MM/dd");

// Mal
void Save()
{
    // ...
}
// Bien
void SaveUserStatus()
{
    // ...
}

// Mal
string[] a = { "Ford", "Rena", "Citroen", "Mazda" };
foreach (var element in a)
{
    // ...
}
// Bien
string[] carMakers = { "Ford", "Rena", "Citroen", "Mazda" };
foreach (var maker in carMakers)
{
    // ...
}
```

Symmetric naming

```
//// Naming, be symmetric
// Mal
public void Start()
{
    // ...
}
public void Finish()
{
    // ...
}

// Bien
public void Start()
{
    // ...
}
public void Stop()
{

}

// Mal
bool on = true;
bool down = false;

// Bien
bool on = true;
bool off = false;
```

Avoid redundant naming

```
//// Redundant naming
// Mal
1 reference
public class Car
{
    0 references
    public string carMake = "Honda";
    0 references
    public string carModel = "Accord";
    0 references
    public string carColor = "Blue";
}

// Bien
1 reference
public class Car
{
    0 references
    public string make = "Honda";
    0 references
    public string model = "Accord";
    0 references
    public string color = "Blue";
}
```

Booleans should answer questions

```
// Naming, boolean should answer question
// Mal
public void Valid()
{
    // ...
}
// Bien
public void IsValidSubmission()
{
    // ...
}

// Mal
bool valid = true;
// Bien
bool isValid = true;

// Mal
bool registered = false;
// Bien
bool isRegistered = false;

// Mal
bool notValid = false;
// Bien
bool isValid = true;



// don't double negate
// Mal
if (!notValid)
{
    // ...
}

// Bien
if (isValid)
{
    // ...
}
```

Naming variables

- Don’t use abbreviations
- Don’t use prefixes of subfixes
- Use noun + verb in function

```
//// Naming, don't use abbreviations
// Mal
var usrPwd = // ....
// Bien
var userPassword = //
```

```
//// Naming, don't use prefixes or suffixes
string strName = "Chespirito";

// Mal

if (bExiste == true)
{
    // ...
}
```

Naming functions

- Don’t use AND, OR, etc.
- Use noun + verb in function

```
// Naming, don't use AND, OR, IF
public void ValidateAndSave(User user)
{
    // ...
}

public void AddOrCreate(File file)
{
    // ...
}

public void SaveOrUpdate()
{
    // ...
}
```

```
//// Naming use noun + verb in functions
// Bad
void Do(User u, Credentials c){
    // ...
}
// Good
void RegisterUser(User user, Credentials credentials){
    // ...
}

// Bad
void get(){
    // ....
}
// Good
void GetRegisteredUsers(){
    // ....
}
```

Clean Code: Naming

- Soluciones
  - Verbalizar con un amigo
  - O con un pato de goma
  - Refactorizar hasta que el nombre sea “limpio”

Condicionales

Clean Code: Condicionales

- Comparar explícitamente
- Usar condicionales positivos (evitar la doble negación)
- Asignar implícitamente
- Evitar "magic numbers"
- Evitar condicionales complejos

Clean Code: Condicionales

- Smells
  - Ser “antinegativo”
  - Magic numbers
  - Asignaciones de booleanos en condiciones
  - Comentarios sobre una condición
  - Condiciones difícil de comprender

Avoid magic numbers

```
//// Conditionals, don't use magic numbers
// Mal
if(user.age > 18){
    // ...
}
// Bien
int validAge = 18;
if(user.age > validAge){
    // ...
}

// Mal
Thread.Sleep(86400000);
// Bien
const int MILLISECONDS_IN_A_DAY = 86400000;
Thread.Sleep(MILLISECONDS_IN_A_DAY);

// Mal
if(userStatus == -1){ // new user
    // ....
}
// Bien
int UserStatusNew = -1;
if(userStatus == UserStatusNew){
    // ....
}
```

Conditionales

- Must be positive
- Don’t be “antinegative”


```
//// Conditionals, be "positive"
// Mal
if(isNotValid())
{
    // ...
}
// Bien
if(isValid())
{
    // ...
}
```

```
//// Conditionals, don't be "anti-negative"
// Mal
if(!IsNotValid())
{
    // ...
}
// Bien
if(IsValid())
{
    // ...
}
```

Conditionales

- Use direct comparison
- Use ternary operator

```
//// Conditionals, use direct comparison
// Mal
if(isValid() == true)
{
    // ...
}
// Bien
if(isValid())
{
    // ...
}
```

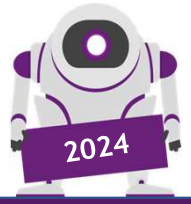
```
//// Conditionals, assign using ternary operator
string message = "";

if (IsValid())
{
    validationOk = "Welcome!";
}
else
{
    validationOk = "Go Away";
}

// Bien
string validationOk = IsValid() ? "Welcome!" : "Go Away";
```

Use functions to clarify

```
//// Conditional, use functions to clarify conditions
// Mal
if (fsm.state == "fetching" && isEmpty(listNode))
{
    // ...
}
// Bien
public bool ShouldShowSpinner(Fsm fsm, ListNode listNode)
{
    return fsm.state == "fetching" && IsEmpty(listNode);
}
if (ShouldShowSpinner(fsmInstance, listNodeInstance))
{
    // ...
}
```

Clean Code: Condicionales

- Soluciones
  - Siempre usar booleanos que respondan preguntas positivas
  - Poner magic numbers en variables
  - Crear funciones si la condición es una regla de negocio
  - Utilizar variables intermedias

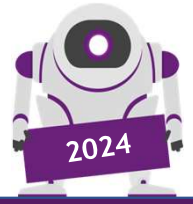



ONe
WEEK
LAteR...

Funciones

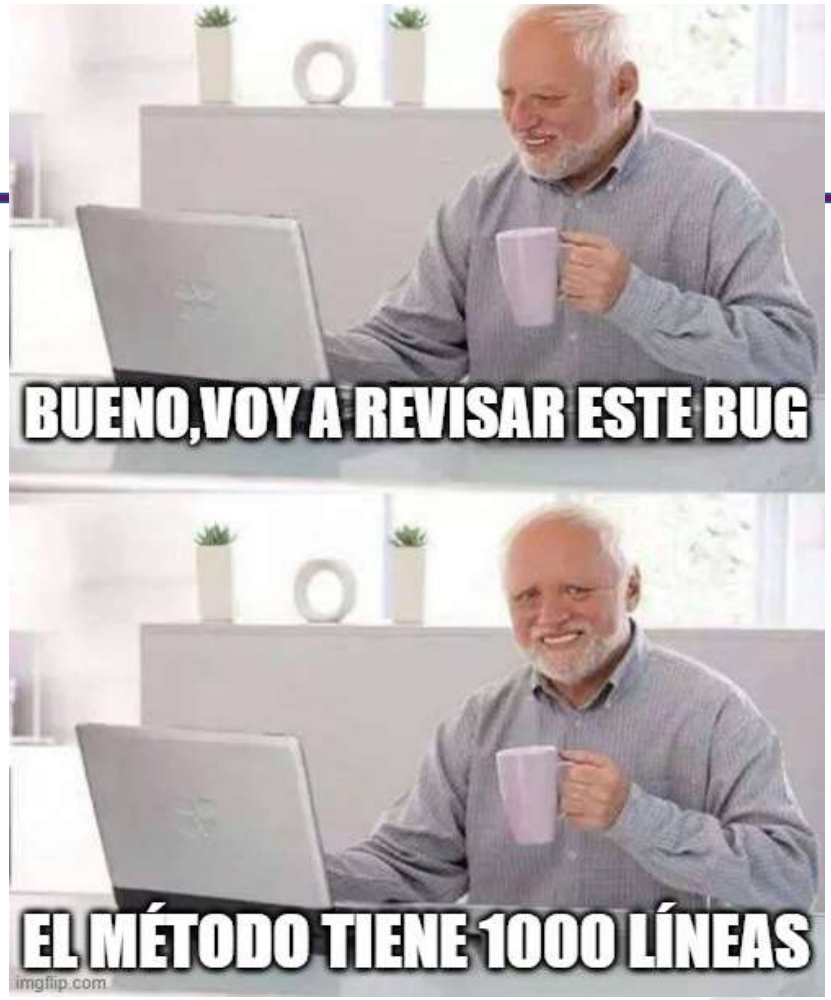
Clean Code: Funciones

- Primitive obsession
- Evitar Arrow Code
- Evitar funciones con demasiada responsabilidad
- Evitar funciones con efectos secundarios
- Evitar muchos argumentos
- Evitar funciones con flag arguments



Clean code: Funciones

- Smells
  - Hay que hacer scroll para leerlas, vertical / horizontal
  - Tienen demasiados parámetros
  - Intención poco clara
  - Cambian con mucha frecuencia



Primitive obsession

```
//// Classes, avoid primitive return types, use classes
// Bad
public object RegisterUser(User user)
{
    // ...
    return json;
}
// Good
public UserRegistrationResult RegisterUser(User user)
{
    return new UserRegistrationResult
    {
        Success = true,
        UserId = 123,
        WelcomeDiscount = 10
    };
}

2 references
public class User
{
    // properties and methods of User class
}

2 references
public class UserRegistrationResult
{
    1 reference
    public bool Success { get; set; }
    1 reference
    public int UserId { get; set; }
    1 reference
    public int WelcomeDiscount { get; set; }
}
```

Arrow code

```
//// Conditionals, avoid arrow code
// MAL
string result = "";

if (!user.IsRegistered())
{
    if (user.Name.Length < 3)
    {
        result = "the name is too short";
    }
    else
    {
        if (user.Password.Length < 4)
        {
            result = "the password is too short";
        }
        else
        {
            if (user.Age < 18)
            {
                result = "you must be over 18 in order to register my friend";
            }
            else
            {
                if (user.Gender == "")
                {
                    result = "A gender must be specified";
                }
                else
                {
                    if (user.Country == "")
                    {
                        result = "Please select a country from the list";
                    }
                    else
                    {
                        if (user.HasValidEmail())
                        {
                            result = "Welcome man";
                        }
                        else
                        {
                            result = "The email is not valid";
                        }
                    }
                }
            }
        }
    }
}
else
{
    result = "This user is already registered";
}
```

```
// Bien - guard clauses
if (user.IsRegistered())
    return "This user is already registered";

if (user.Name.Length < 3)
    return "The name is too short";

if (user.Password.Length < 4)
    return "the password is too short";

if (user.Age < 18)
    return "you must be over 18 in order to register my friend";

if (user.Gender == "")
    return "A gender must be specified";

if (user.Country == "")
    return "Please select a country from the list";

if (!user.HasValidEmail())
    return "The email is not valid";

return "Welcome man";
```

Too many arguments

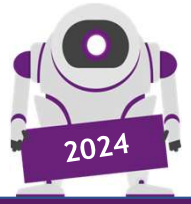
```
//// Functions, avoid too many arguments, use clases instead
// Mal
public void Register(string name, string lastName, int age, string email, string country)
{
    // ...
}

// Bien
2 references
public class User
{
    1 reference
    public string Name { get; set; }
    1 reference
    public string LastName { get; set; }
    1 reference
    public int Age { get; set; }
    1 reference
    public string Email { get; set; }
    1 reference
    public string Country { get; set; }

    0 references
    public User(string name, string lastName, int age, string email, string country)
    {
        Name = name;
        LastName = lastName;
        Age = age;
        Email = email;
        Country = country;
    }
}

public void RegisterUser(User user)
{
    // ...
}
```

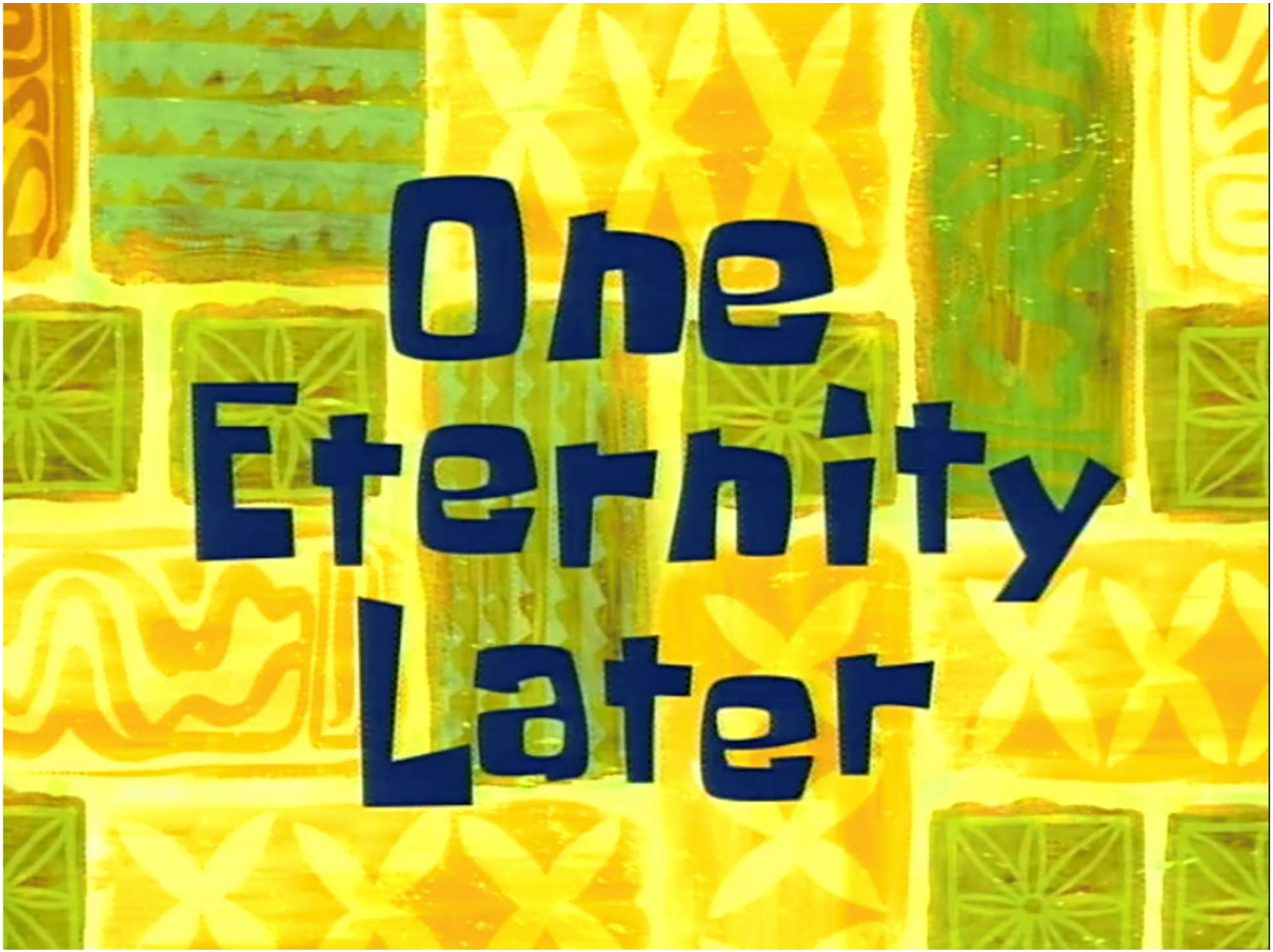
Flag arguments

```
//// Functions, don't use flag arguments
  // Bad
  void CreateFile(string name, bool temp)
  {
    if (temp)
    {
      fs.Create($"./temp/{name}");
    }
    else
    {
      fs.Create(name);
    }
  }
  // Good
  void CreateFile(string name)
  {
    fs.Create(name);
  }
  void CreateTempFile(string name)
  {
    CreateFile($"./temp/{name}");
  }
```

Clean Code: Funciones

- Soluciones
  - Guard clauses
  - Fail fast
  - Extract method
  - Nuevas clases
  - Rename

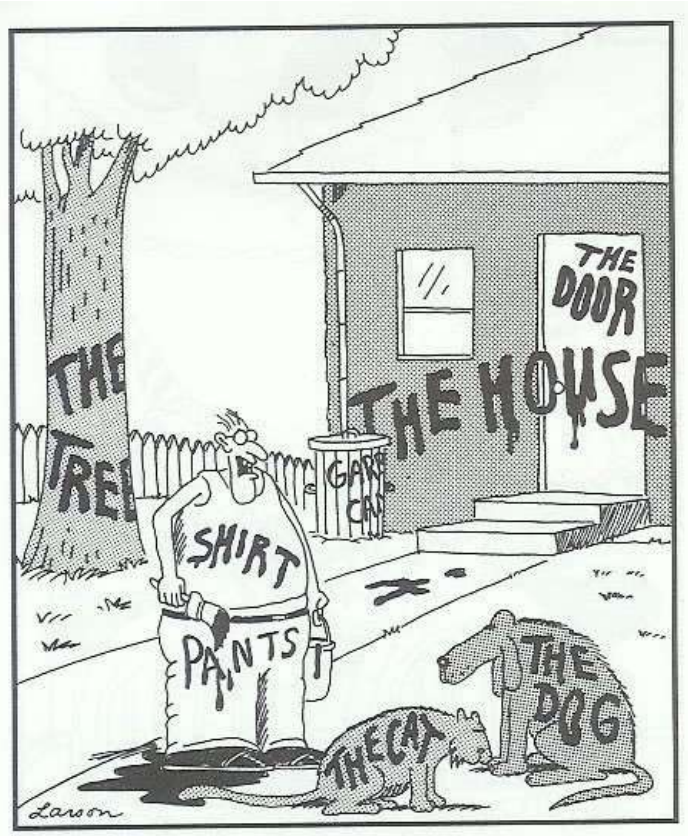



One
Eternity
Later

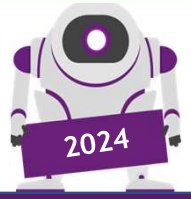
Comentarios

Clean Code: Comentarios

- Pueden indicar que nuestro código no es claro
- Evitar comentarios obvios
- Evitar comentarios desactualizados

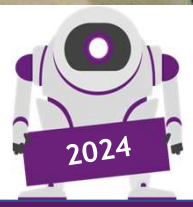


"Now! … *That* should clear up a few things around here!"



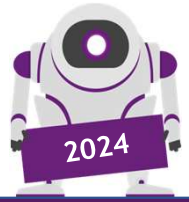
Clean Code: Comentarios

- Smells
  - Los comentarios son más grandes que el código
  - El comentario dice lo mismo que el nombre de la función
  - El comentario intenta explicar algo que el código debería
  - El comentario está desactualizado
  - El comentario indica miedo



Clean Code: soluciones

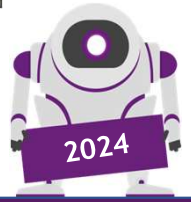
- Al escribir un comentario pensar por qué lo hacemos
- Cambiar la función / variable para que indique su intención
- Borrar comentarios en condiciones y extraer la condición



Keep improving

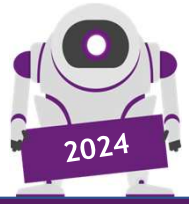
Refactor

- Cambiar el código sin modificar su comportamiento
- Hacerlo más legible
- Lo detectamos gracias a Code Smells, Patrones, DRY, etc.
- Aplicar algunos de los conceptos
  - KISS
  - DRY
  - SOLID
- Baby steps
- El mejor refactor es el que quita código



Mind set

- Mirar el código
- No odiar
- Respect
- Baby steps



Mantenimiento

- Refactoring
- Baby steps
- No aceptar ventanas rotas
- Code reviews
- Pair programming

"Always leave the code you're editing a little better than you found it."
Robert C. Martin

John Lennon (tal vez)

“Life is what happens to you while you’re busy trying to understand your own code”

¿Preguntas?

Referencias

- https://github.com/leomicheloni/sabados-tech-clean-code
- https://app.pluralsight.com/library/courses/writing-clean-code-humans
- https://www.amazon.es/Refactoring-Improving-Design-Existing-Technology/dp/0201485672/
- https://www.amazon.es/Clean-Code-Handbook-Software-Craftsmanship/dp/0132350882
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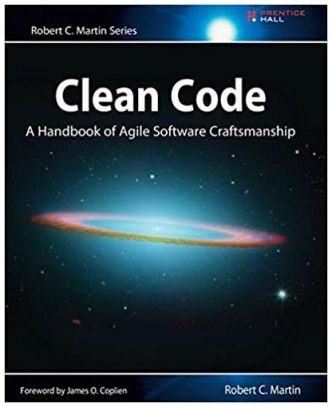
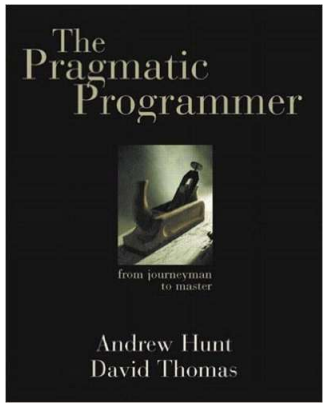
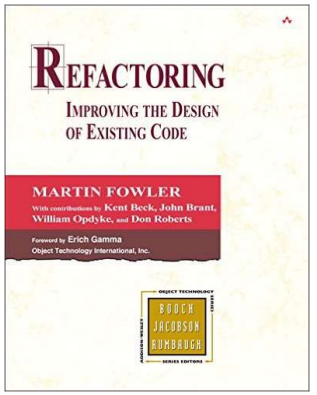
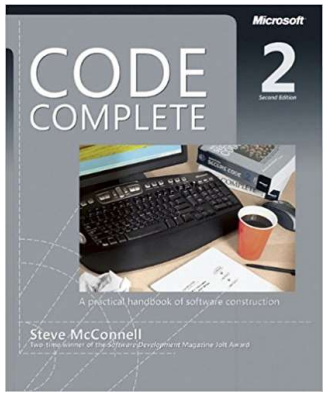
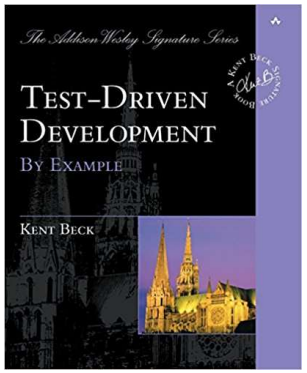
- https://www.amazon.es/Pragmatic-Programmer-Journeyman-Master/dp/020161622X/
- https://www.amazon.es/Head-First-Design-Patterns-Freeman/dp/0596007124/
- https://github.com/tcorral/Refactoring_Patterns











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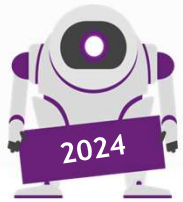

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