INTRODUCTION

NEODYBLUE & TOOGY

GCONFS

Menu du jour

1. Programmation Impérative

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1. Programmation Impérative

2. Syntaxe C#

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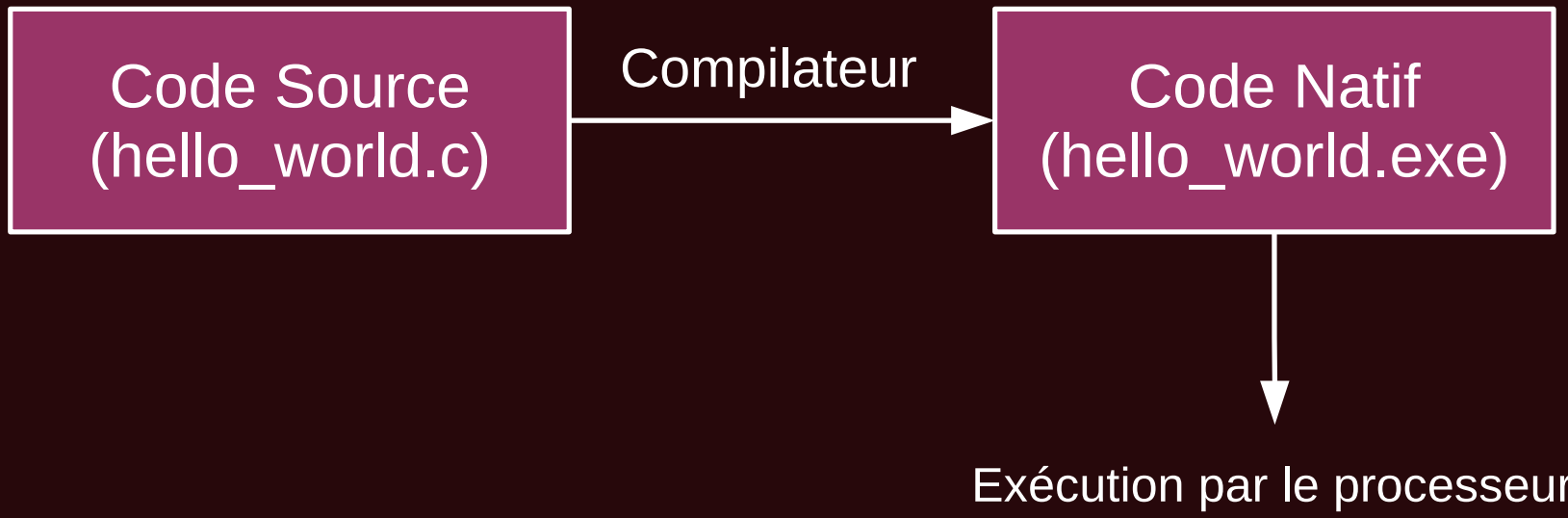
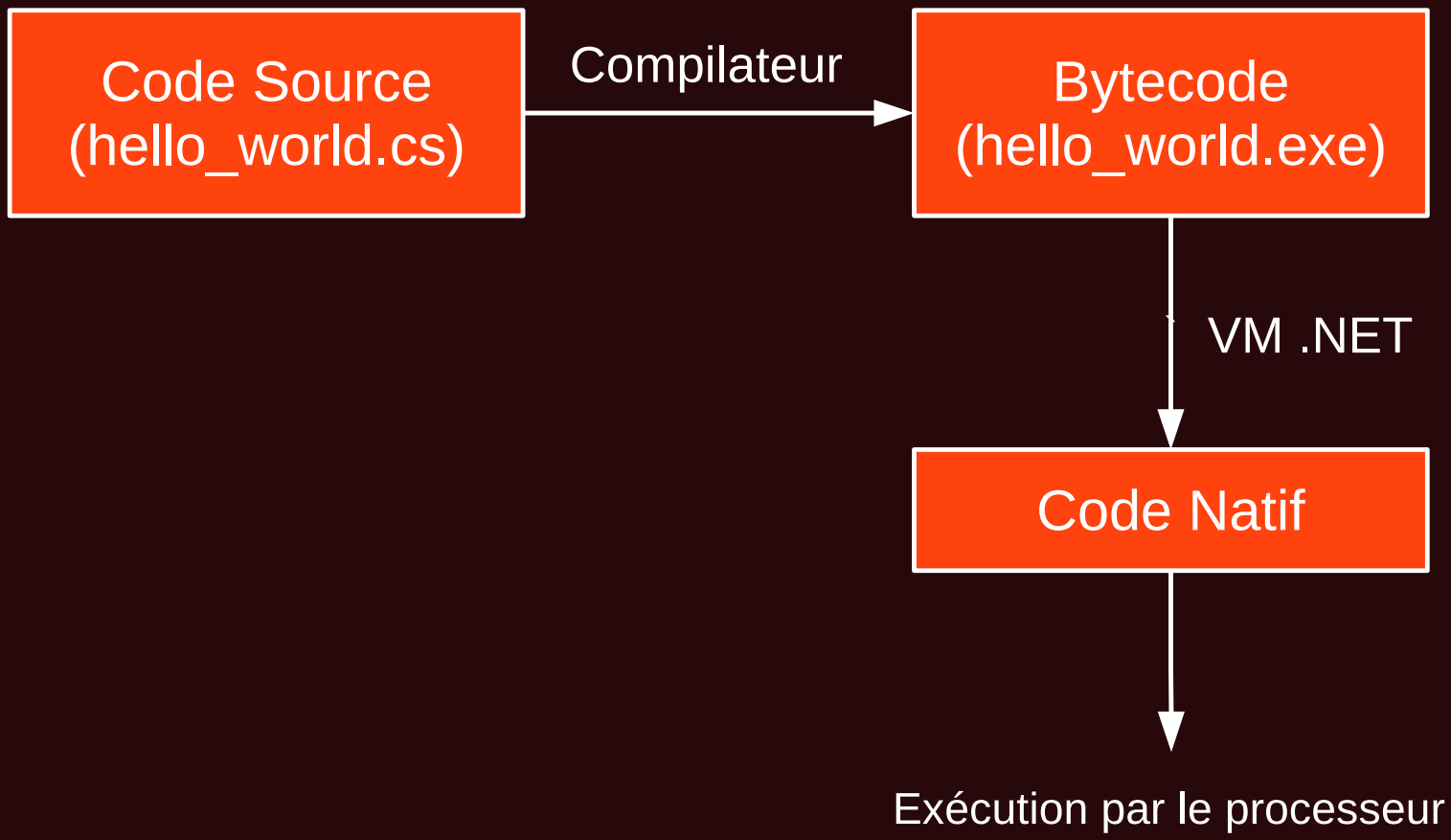
2. Syntaxe C#
3. Programmation Orientée Objet *(POO)*

Menu du jour

1. Programmation Impérative
2. Syntaxe C#
3. Programmation Orientée Objet *(POO)*
4. Quelques conseils


Code Source
(hello_world.c)
Compilateur
Code Natif
(hello_world.exe)
Exécution par le processeur


Code Source
(hello_world.cs)
Compilateur
Bytecode
(hello_world.exe)
VM .NET
Code Natif
Exécution par le processeur

Programmation **Impérative**

Mon ordinateur, mon esclave

- Fais moi un sandwhich ;

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- Fais la vaisselle ;

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- Sors les poubelles ;

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  { Lave le sol ; }

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- Si (il y a du courrier) :
  { Va chercher le courrier ; }

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Il obéit.

Syntaxe C#

Les variables

Déclaration

- <type> <name> ;
- <type> <name> = <valeur> ;
- <type>[ ] <name> ;
- <type>[ ] <name> = new <type>[<size>] ;

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Déclaration

Exemples

```
int i;
string str;
int a = 5;
long verylong = 1000000000000000;
float val = 6.4f;
double d = 4.2;
string str2 = "Hello";
int[] datas = new int[10];
```

Manipulation

Nombres

```
int[] results = new int[2];
int a = 4;
bool vrai = true;
bool faux = false;
int b = 6;
a = -1;
results[0] = a + b; // [0] = 5
b = 3;
results[1] = a * b; // [1] = -3
```

Strings

```
string name = "Neodyblue";
string text = "Welcome " + name + "!";// "Welcome Neodyblue!"
```

Manipulation

Nombres

```
int[] results = new int[2];
int a = 4;
bool vrai = true;
bool faux = false;
int b = 6;
a = -1;
results[0] = a + b; // [0] = 5
b = 3;
results[1] = a * b; // [1] = -3
```

Strings

```
string name = "Neodyblue";
string text = "Welcome " + name + "!";// "Welcome Neodyblue!"
```

Les structures de contrôle

Les opérateurs de comparaison

- == : 3 == 3
- != : 1 != 2
- < : 1 < 3
- > : 3 > 1
- <= : 1 <= 1
- >= : 4 >= 2

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- >= : 4 >= 2

Le Test.

```
Console.WriteLine("Say my name!");
string name = Console.ReadLine();

if (name == "Heisenberg")
{
  Console.WriteLine("You're goddamn right.");
}
else
{
  Console.WriteLine("You lose!");
}
```

Les boucles

```
for (<init>; <booleen>; <step>)
{
  // Do something
}
```

```cpp
for (int i = 0; i < 10; ++i)
{
  // This code will be executed 10 times
  // i values : 0, 1, 2, ..., 8, 9
}
```

```
while (<booleen>)
{
  // Do something
}
```

```
string str = "";
while (str.Length != 10)
{
  str += "A";
}
```

```
do
{
  // Do something at least 1 time
} while (<booleen>);
```

```
string str = "";
do
{
  str = Console.ReadLine();
  // Do something with str
} while (str != "exit");
```

Factorisation : les fonctions

Déclaration de fonction

```
<type> <name>(<parameter>)
{
  // Code
}
```

```c
int sum(int a, int b)
{
  return a + b;
}
bool is_even(int n)
{
  return n % 2 == 0;
}
```

```c
int div(int c, int d)
{
  if (d == 0)
  {
    // FAIL
  }
  else
    return c / d;
}
```

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int div(int c, int d)
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  if (d == 0)
  {
    // FAIL
  }
  else
    return c / d;
}
```

```
int x = 5;
int y = 11;

int result_sum = sum(x, y); // result_sum = 16
int result_div = div(x, y); // result_div = 0
bool even = is_even(y); // even = false
```

Surcharge

```
void print(int n)
{
  Console.WriteLine (n);
}

void print(int n, string msg)
{
  Console.WriteLine (msg + " " + n);
}
```

Les collections

Listes

```
List<<type>> <name> = new List<<type>>();
```

```
List<string> words = new List<string>();
```

Ajout et suppression

```
words.Add("hello");
words.Add("world");
words.Add("test");

words.Remove("test");
```

```
List<string> words = new List<string>();
```

Ajout et suppression

```
words.Add("hello");
words.Add("world");
words.Add("test");

words.Remove("test");
```

Parcourir une collection

```
foreach (<type> <name> in <collection>)
{
  // Do something with <name>
}

for (int i = 0; i < <collection>.Count; ++i)
{
  // Do something with <name> and its index
}
```

Parcourir une collection

```
foreach (string word in words)
{
  Console.WriteLine(word);
}

for (int i = 0; i < words.Count; ++i)
{
  Console.WriteLine("[" + i + "]: " + words[i]);
}
```

Programmation Orientée Objet *(POO)*

Field (champ)

```
public class Circle
{
    public double radius;
    public string color;
}
```

Method

```
public class Circle
{
    public double radius;
    public string color;

    public void setColor(string newColor)
    {
      this.color = newColor;
    }
}
```

Property (propriété)

Snippet VS : propfull

```
public class Truc
{
    // backing field
    private int _attribut;

    public int Attribut // propriété
    {
        get { return _attribut; }
        set { _attribut = value; }
    }
}
```

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    private int _attribut;

    public int Attribut // propriété
    {
        get { return _attribut; }
        set { _attribut = value; }
    }
}
```

Validation

```
class Thermostat
{
    private int _temperature; // backing field

    public int Temperature // propriété
    {
        get { return _temperature; }
        set
        {
            if (value >= 50)
                _temperature = 50;
            else
                _temperature = value;
        }
    }
}
```

Auto-propriété

Snippet VS : prop

```
public class Objet
{
    public int Attribut { get; set; };
}
```

Accès privé sur le *set*

Snippet VS : propg

```
public class Objet
{
    public int Attribut { get; private set; };
}
```

Auto-propriété

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public class Objet
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```

Accès privé sur le *set*

Snippet VS : propg

```
public class Objet
{
    public int Attribut { get; private set; };
}
```

Interface

```
interface IBicycle
{
     string BrandName { get; set; }

     void Brake();
}

class BlueBicycle  : IBicycle
{
    private string _brandName;

    public string BrandName {
        get { return _brandName; }
        set { _brandName = lowerCase(value); }
    }

    void Brake() {
        // Braaaaaake! :o
    }
}
```

Interface

```
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     string BrandName { get; set; }

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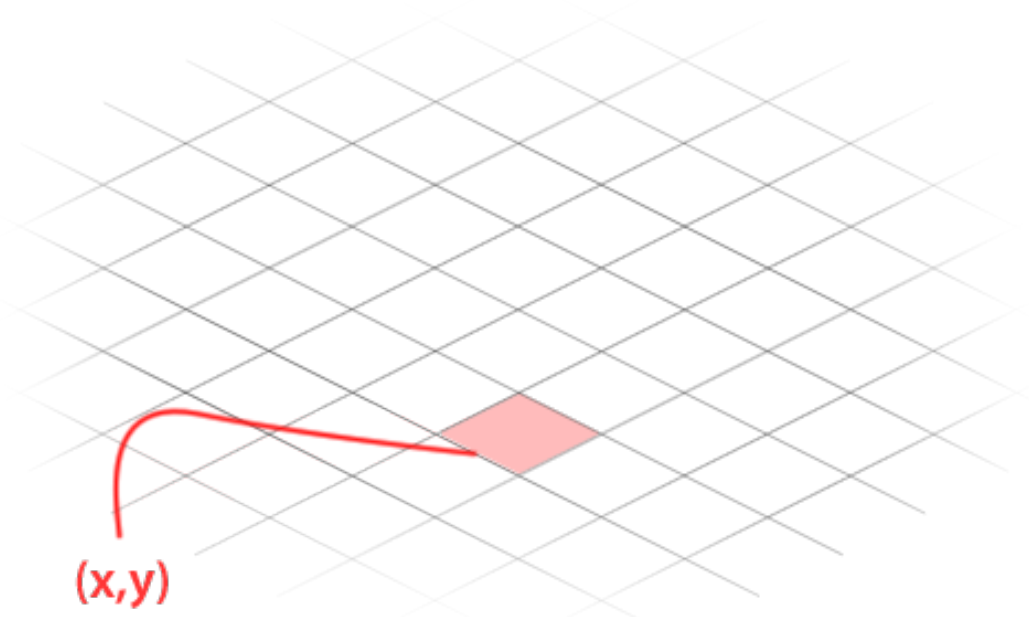
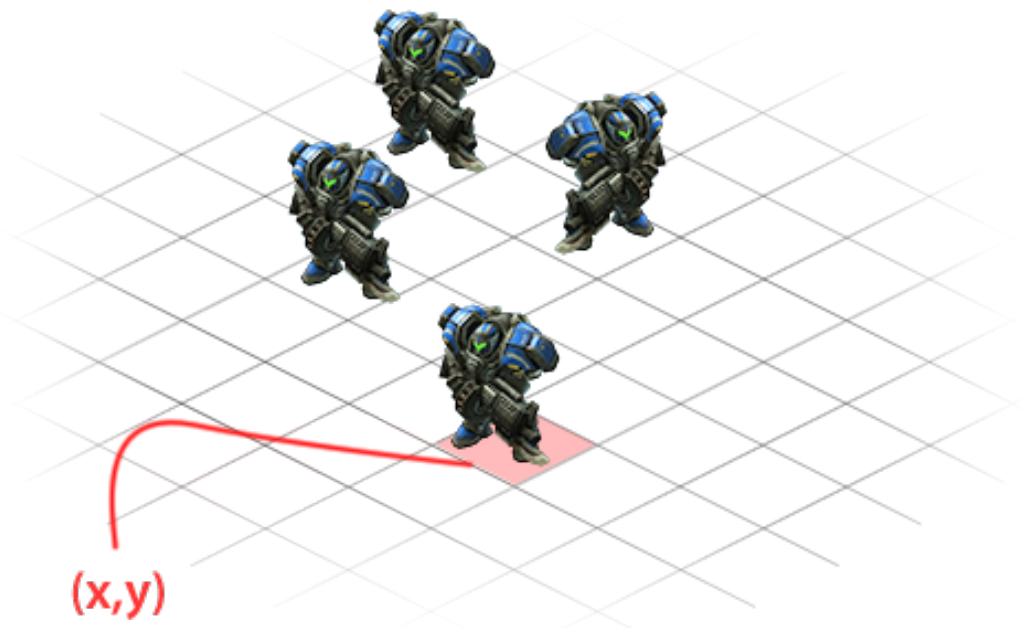
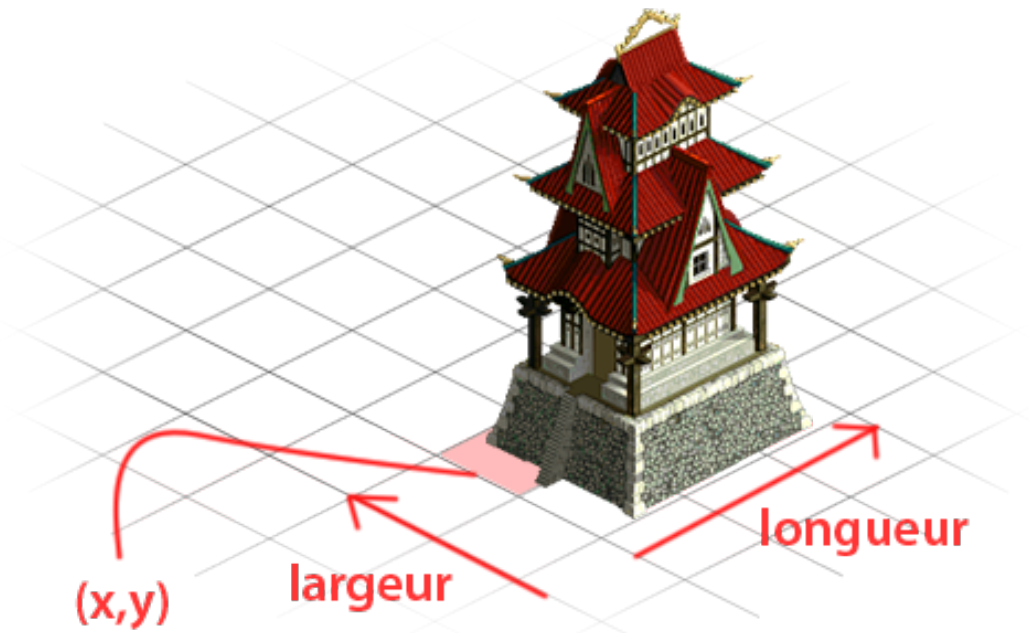

(x,y)


(x,y)

Modélisation d'une unité

```
class Unit
{
    public Tuple<int,int> Position { get; set; }

    public int HealthPoints { get; set; }
    private int _maxHealthPoints;

    public int Speed { get; private set; }

    public int Dps { get; private set; }

    public void Move(Tuple<int,int> destination)
    {
        // Bouger
    }

    public void Die()
    {
        // Mourir
    }
}
```


(x,y)
largeur
longueur

Modélisation d'un bâtiment

```
class Building
{
    public Tuple<int,int> Position { get; private set; }
    public Tuple<int,int> Size { get; private set; }

    public List<Unit> Units { get; set; }

    public int HealthPoints { get; set; }
    private int _maxHealthPoints;

    public void Die()
    {
        // Mourir
    }
}
```

```
class Unit
{
    public Tuple<int,int> Position { get; set; }

    public int HealthPoints { get; set; }
    private int _maxHealthPoints;

    public int Speed { get; private set; }

    public int Dps { get; private set; }

    public void Move(Tuple<int,int> destination)
    {
        // Bouger
    }

    public void Die()
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        // Mourir
    }
}
```

```
abstract class GameItem
{
    public Tuple<int,int> Position
        { get; private set; }

    public int HealthPoints
        { get; set; }

    private int _maxHealthPoints;

    public abstract void Die();
}
```

```
class Building  : GameItem
{
    public Tuple<int,int> Size
        { get; private set; }

    public List<Unit> Units
        { get; set; }

    public override void Die()
    {
        // Mourir
    }
}
```

```
class Unit  : GameItem
{
    public int Speed
        { get; private set; }

    public int Dps
        { get; private set; }

    public void Move(
        Tuple<int,int> destination)
    {
        // Bouger
    }

    public override void Die()
    {
        // Mourir
    }
}
```

Héritage

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    }

    public override void Die()
    {
        // Mourir
    }
}
```

Héritage

```
class MyClass
{
    public void MyFonction()
    {
        List<GameItem> gameItems = new List<GameItem>();

        gameItems.Add(new Unit());
        gameItems.Add(new Building());
    }
}
```

Virtual methods

```
abstract class Unit
{
    public virtual void Die()
    {
        // A single death is a tragedy; a million deaths is a statistic.
    }
}

class Bomber  : Unit
{
    public override void Die()
    {
        // Kill everyone around before actually dying

        base.Fonction(parameter);
    }
}
```

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}
```

Quelques conseils

ReSharper

https://www.jetbrains.com/resharper/

Documenter son code

```
/// <summary>
/// Elle fait quoi cette fonction ?
/// </summary>
/// <returns>Qu'est ce que ça retourne ?</returns>
/// <param name="a">C'est quoi ce paramètre ?</param>
/// <param name="b">C'est quoi ce paramètre ?</param>
int sum(int a, int b)
{
  return a + b;
}
```


git

Des choses pas claires ?