



Challenge De Programmation

—
LY Johann
TOUJANI Med



L'École des Ingénieurs Scientifiques

Table De Matière



- Plan

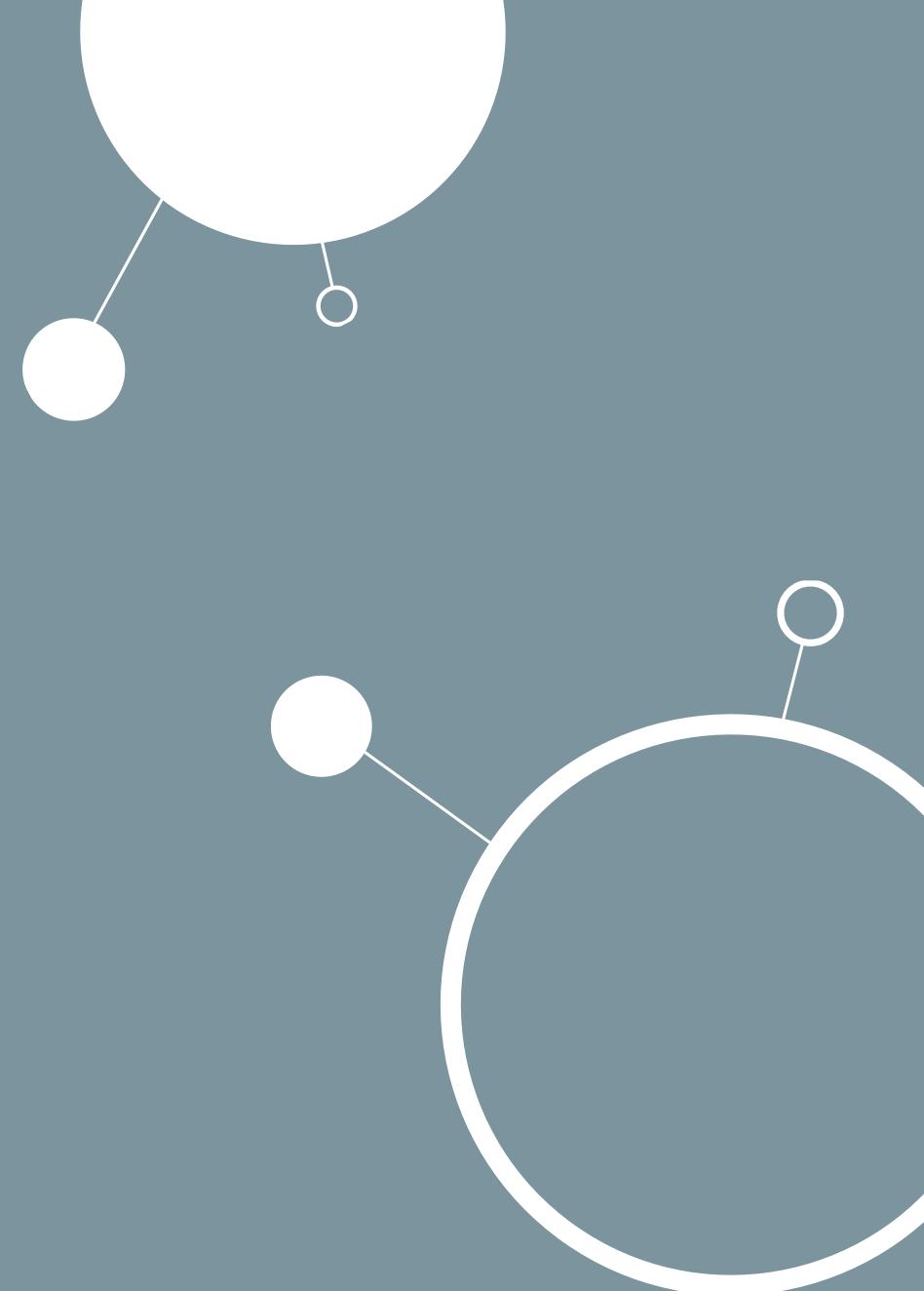
Pré-présentation

Méthode de Résolution

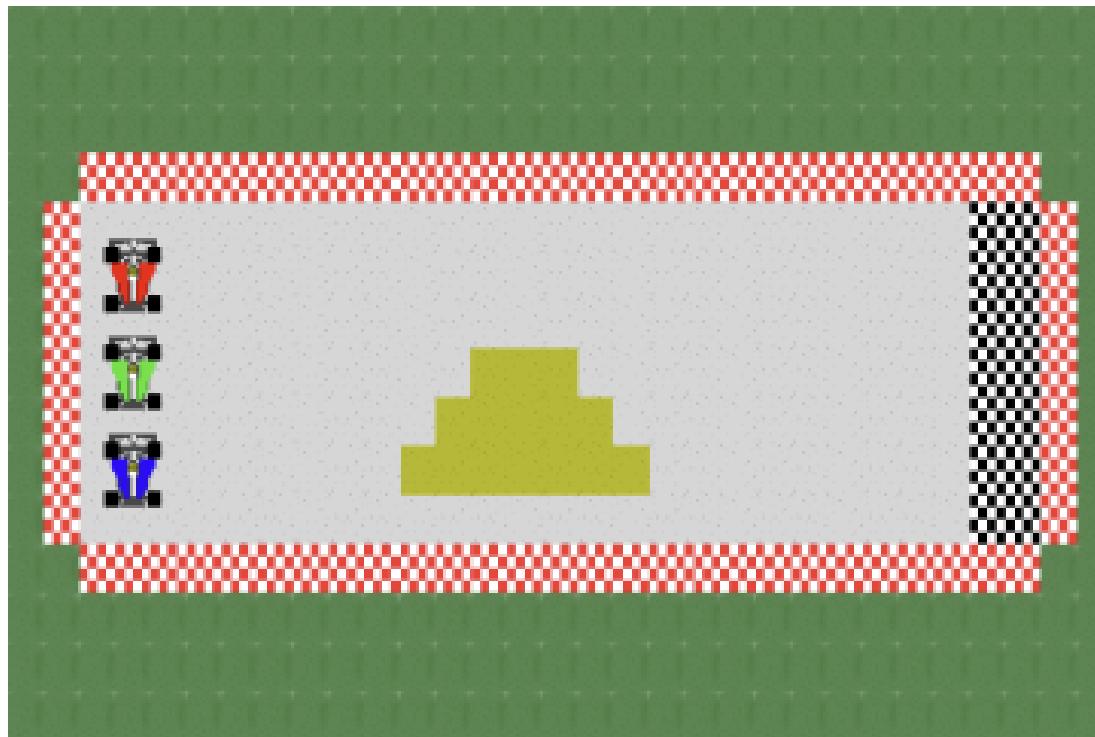
Karhba

Bilan

Pré-présentation



Simulation – du principe au representation sur le GDC



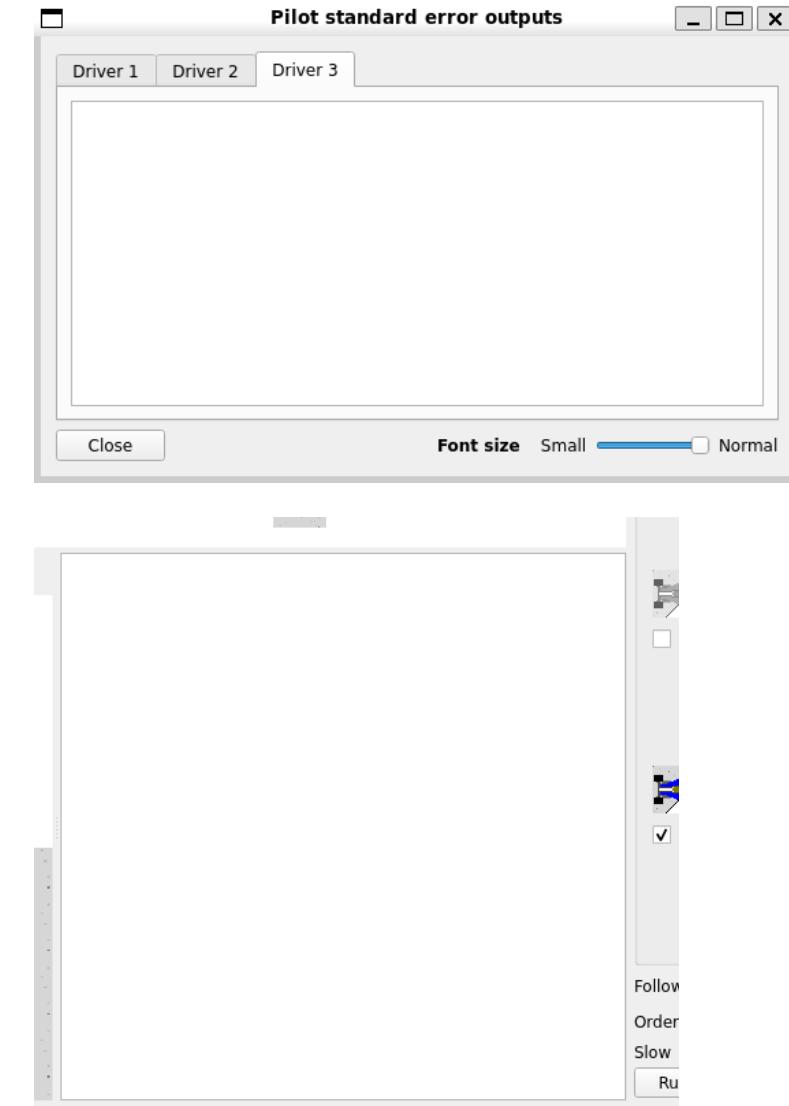
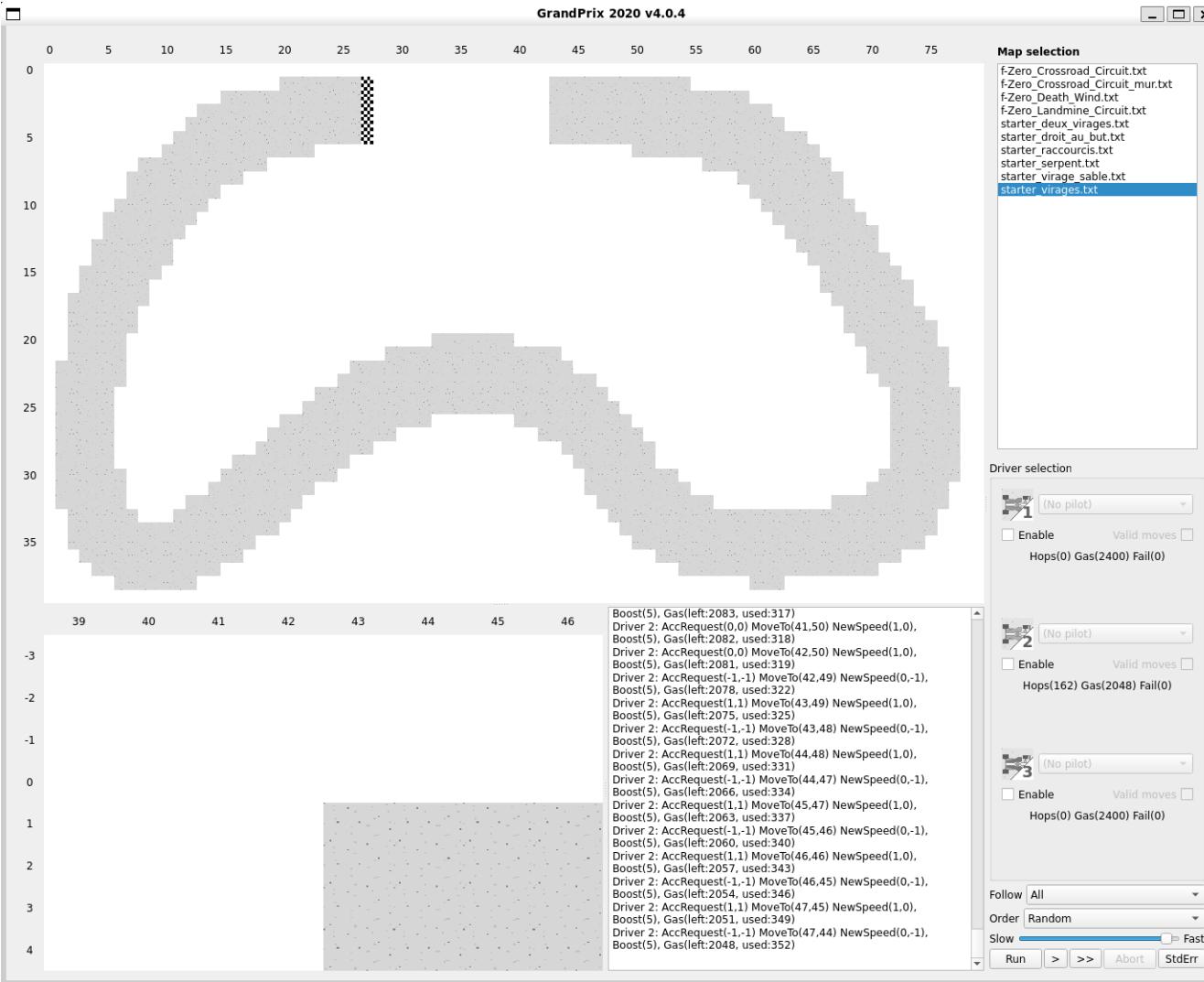
(a)

31 15 35

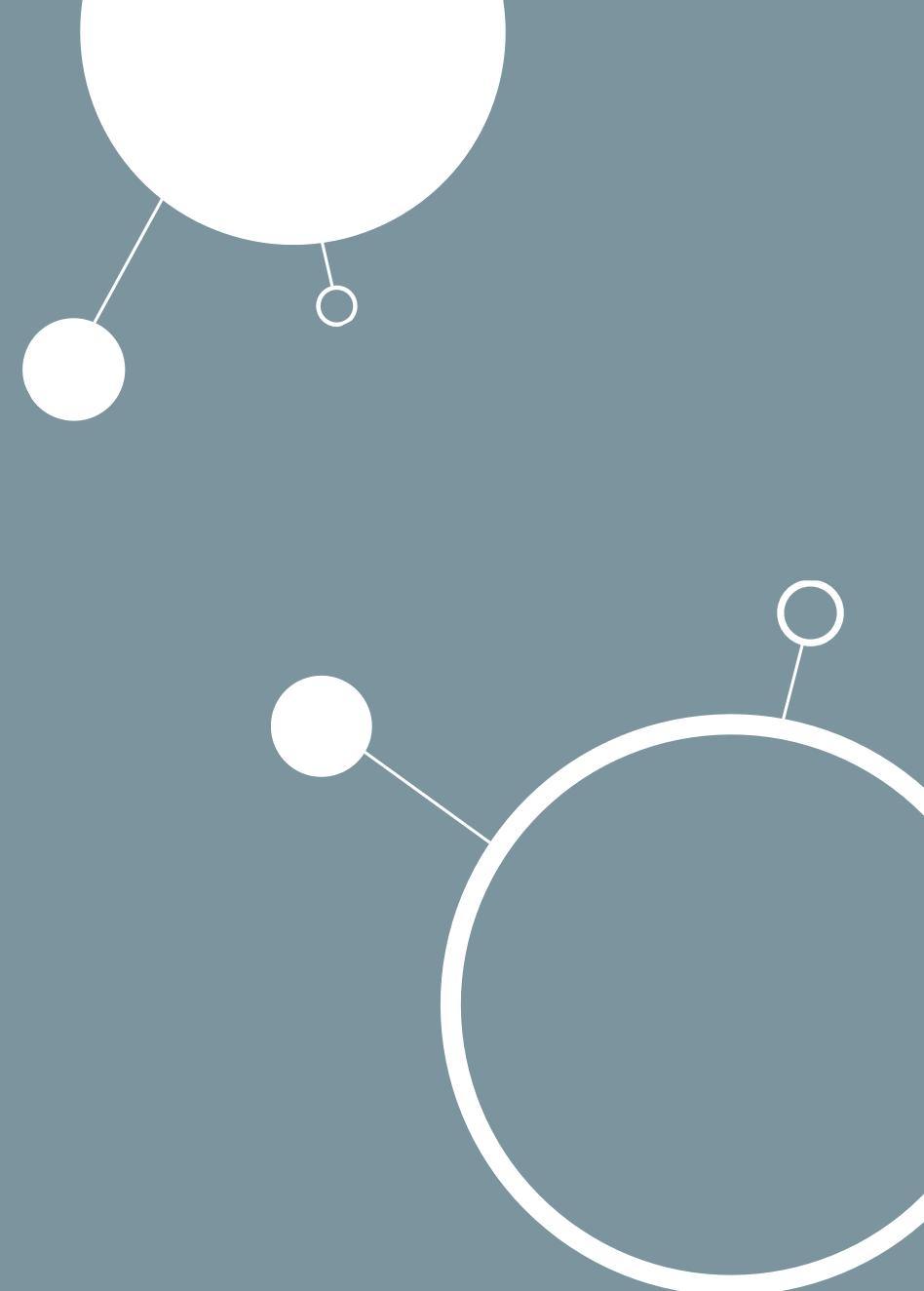
```
.....  
.....  
.....  
.....  
..#####=  
..#1#####=  
..#####=  
..#2#####=  
..#####=  
..#3#####=  
..#####=  
.....  
.....  
.....
```

(b)

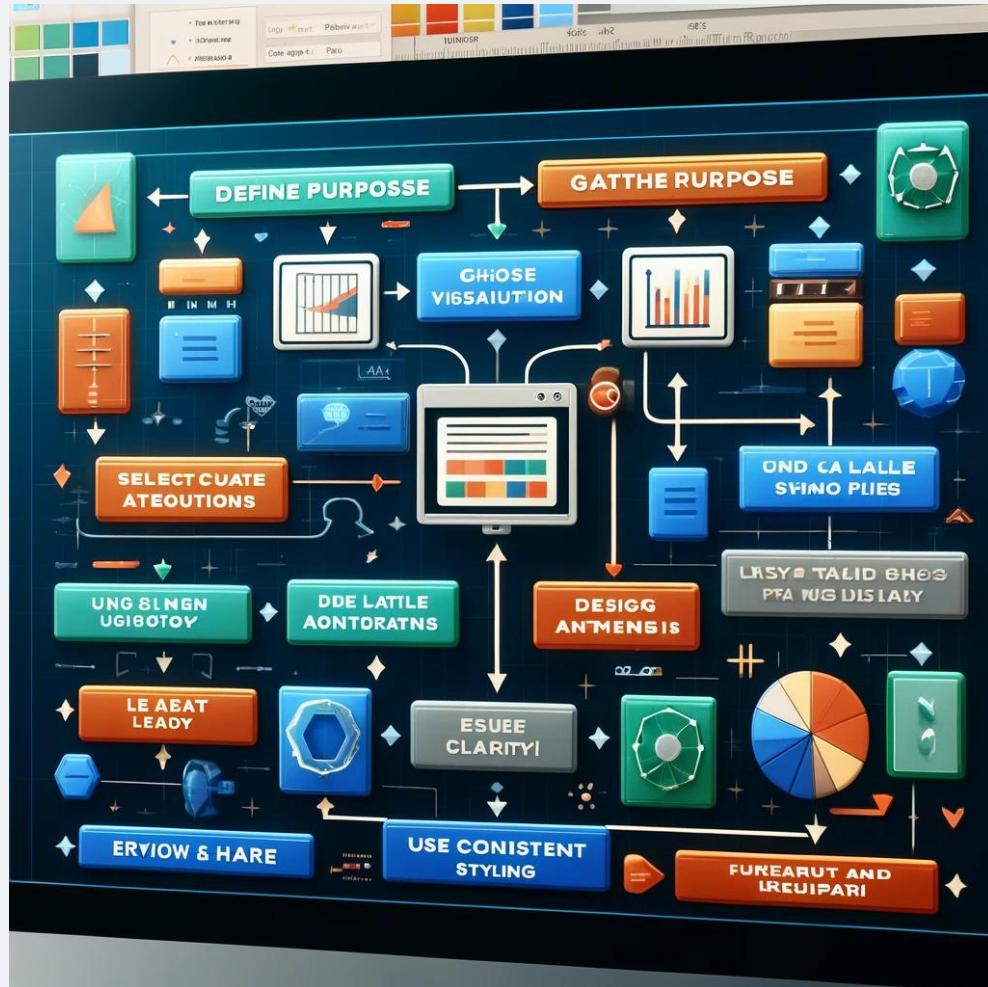
GDC et communication avec le pilote



Méthode de Résolution



Méthode de Résolution

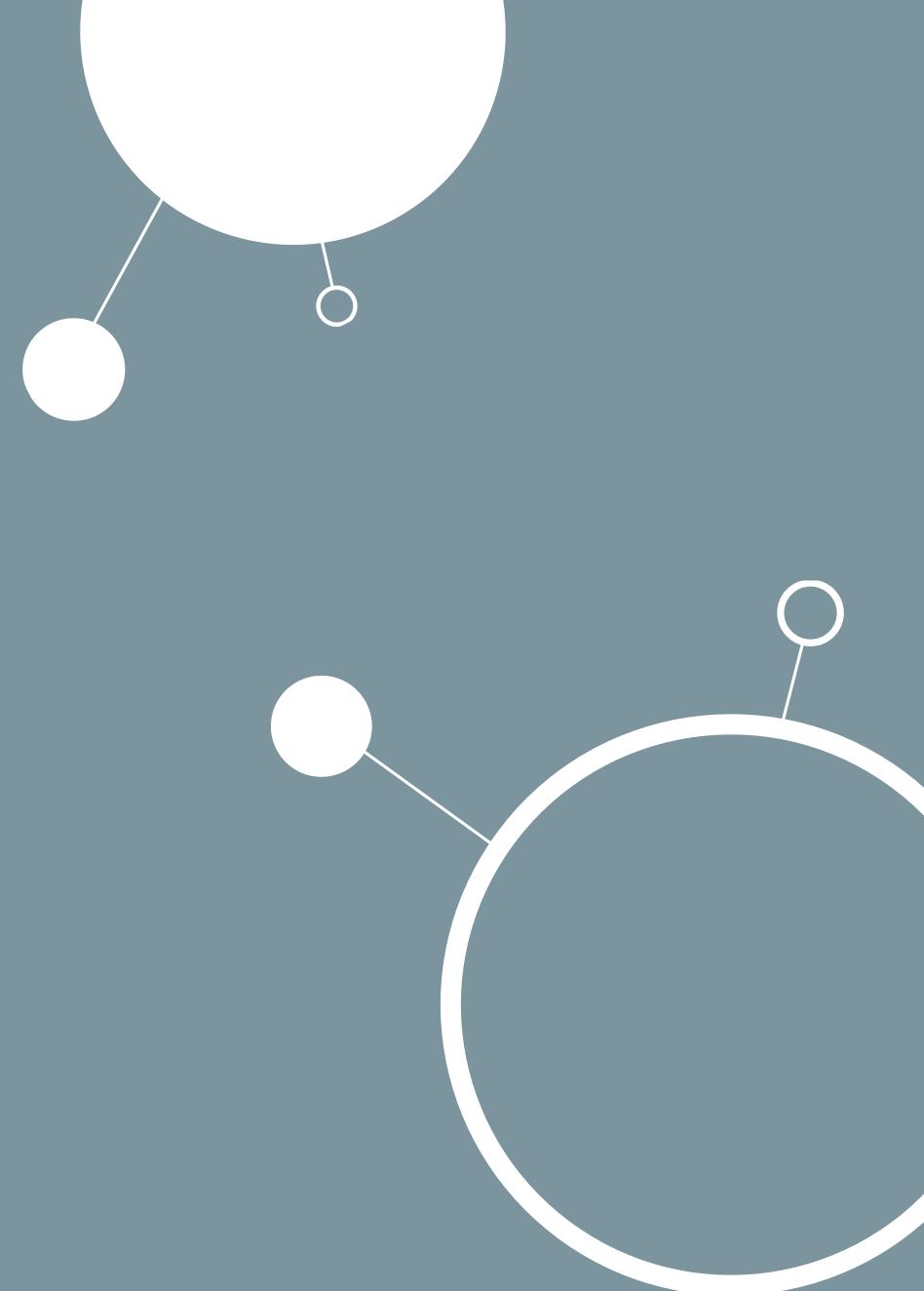


- Plan

Details de la méthode

Test

Détail sur la méthode



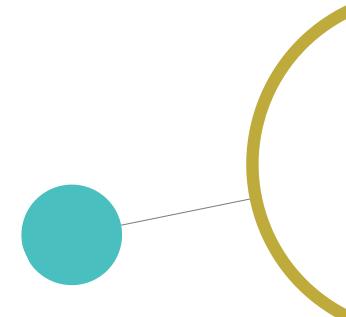
List

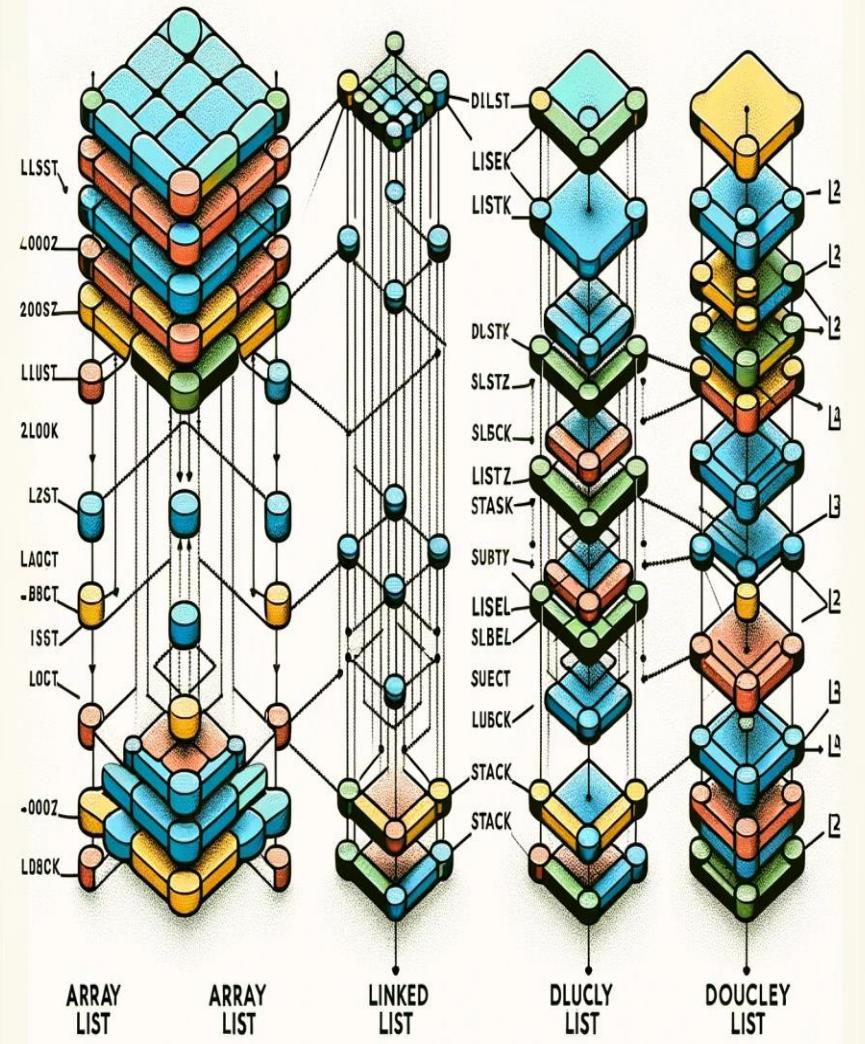
Heap

Graph

scanMap

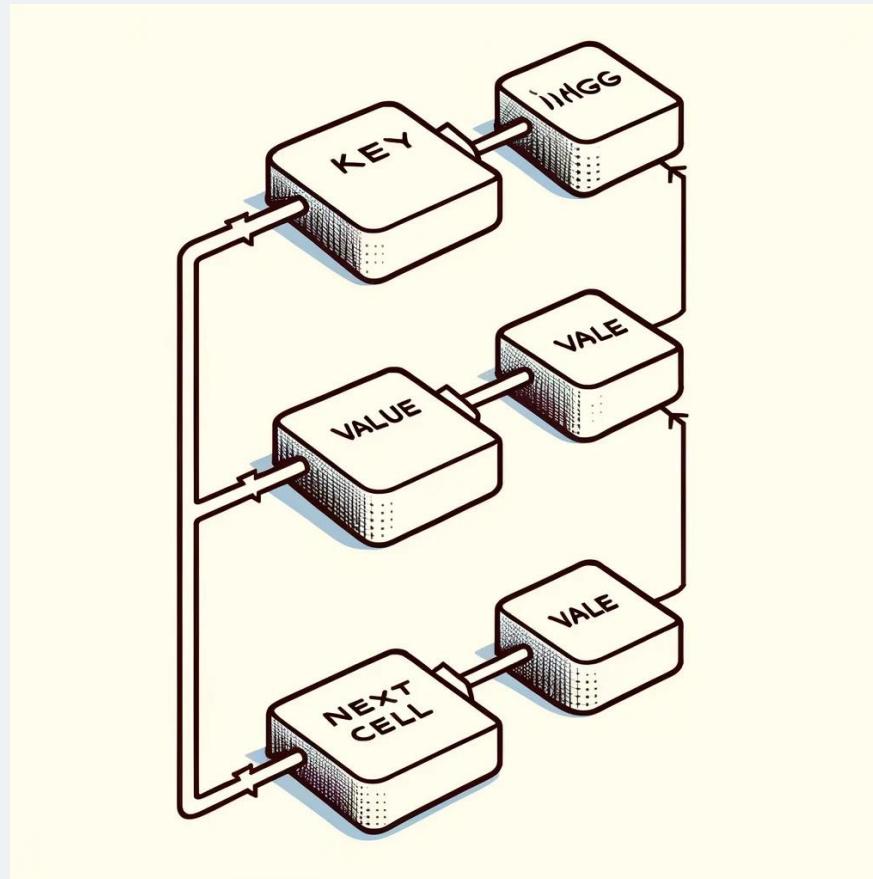
Pilot





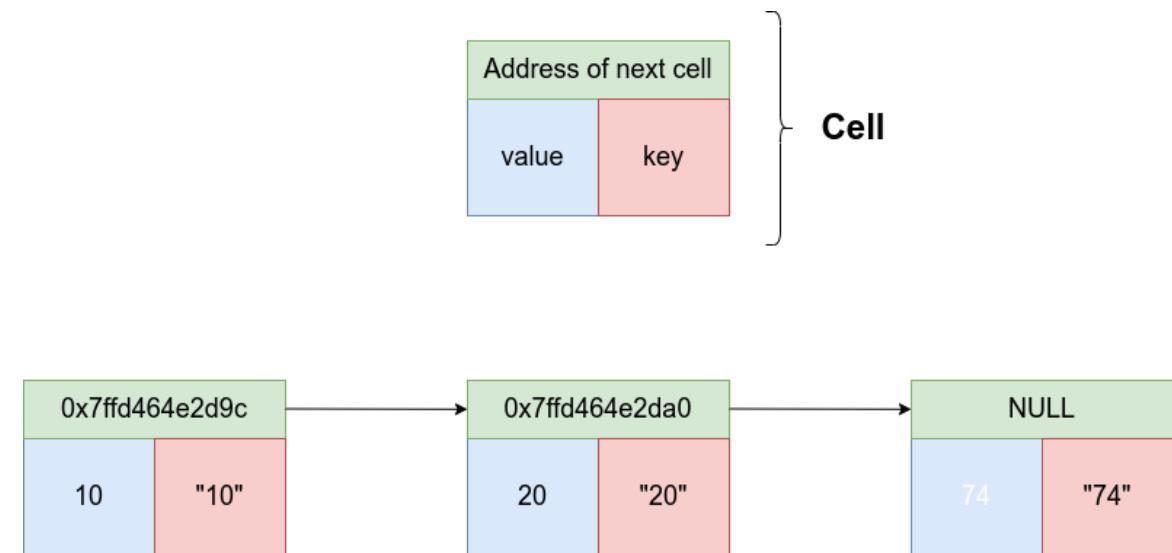
List

Structure d'une liste

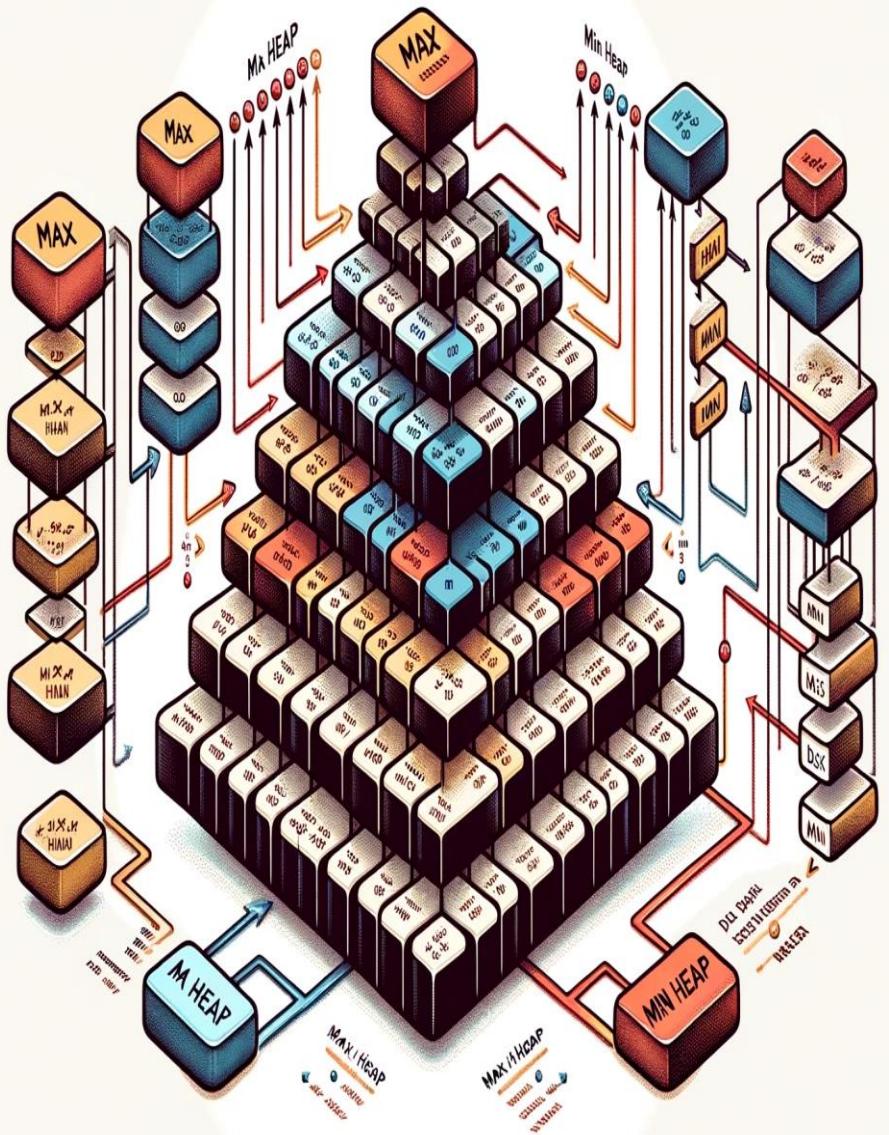


Implémentation de List

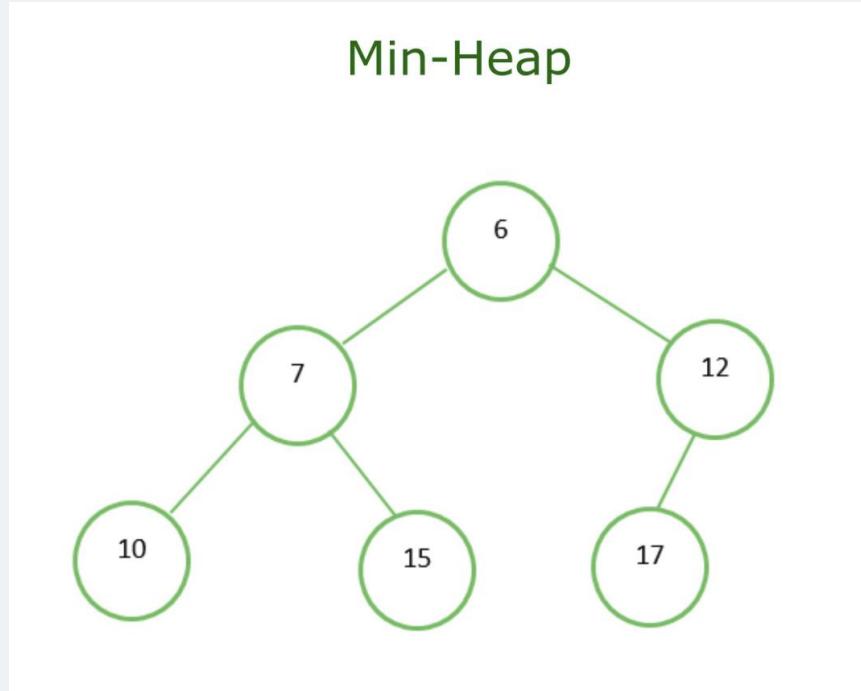
- newList
- freeList
- printList
- findKeyInList
- delKeyInList
- addKeyValueInList



Heap

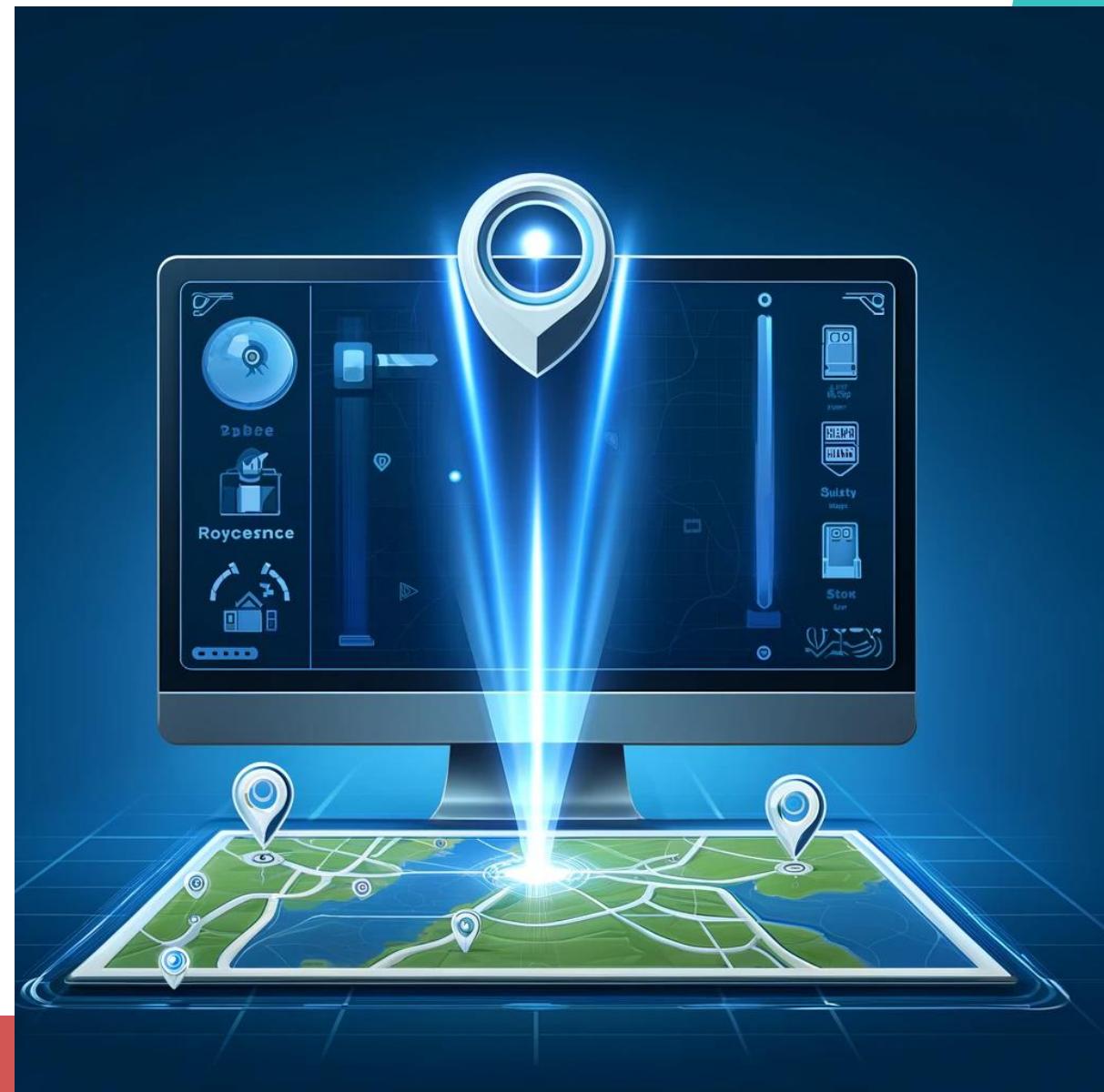


Structure d'un tas

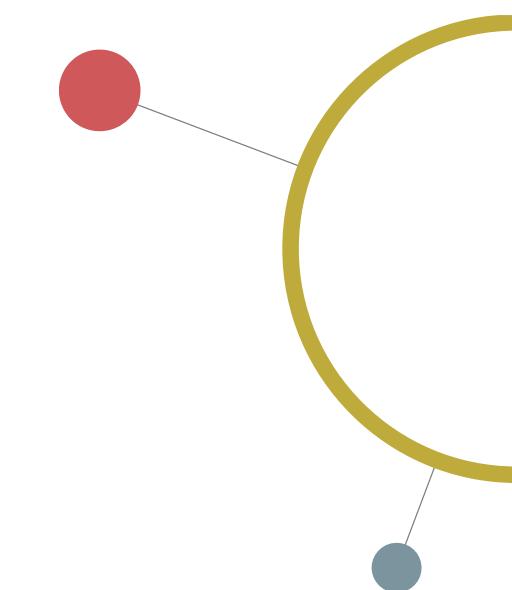


Implémentation de Heap

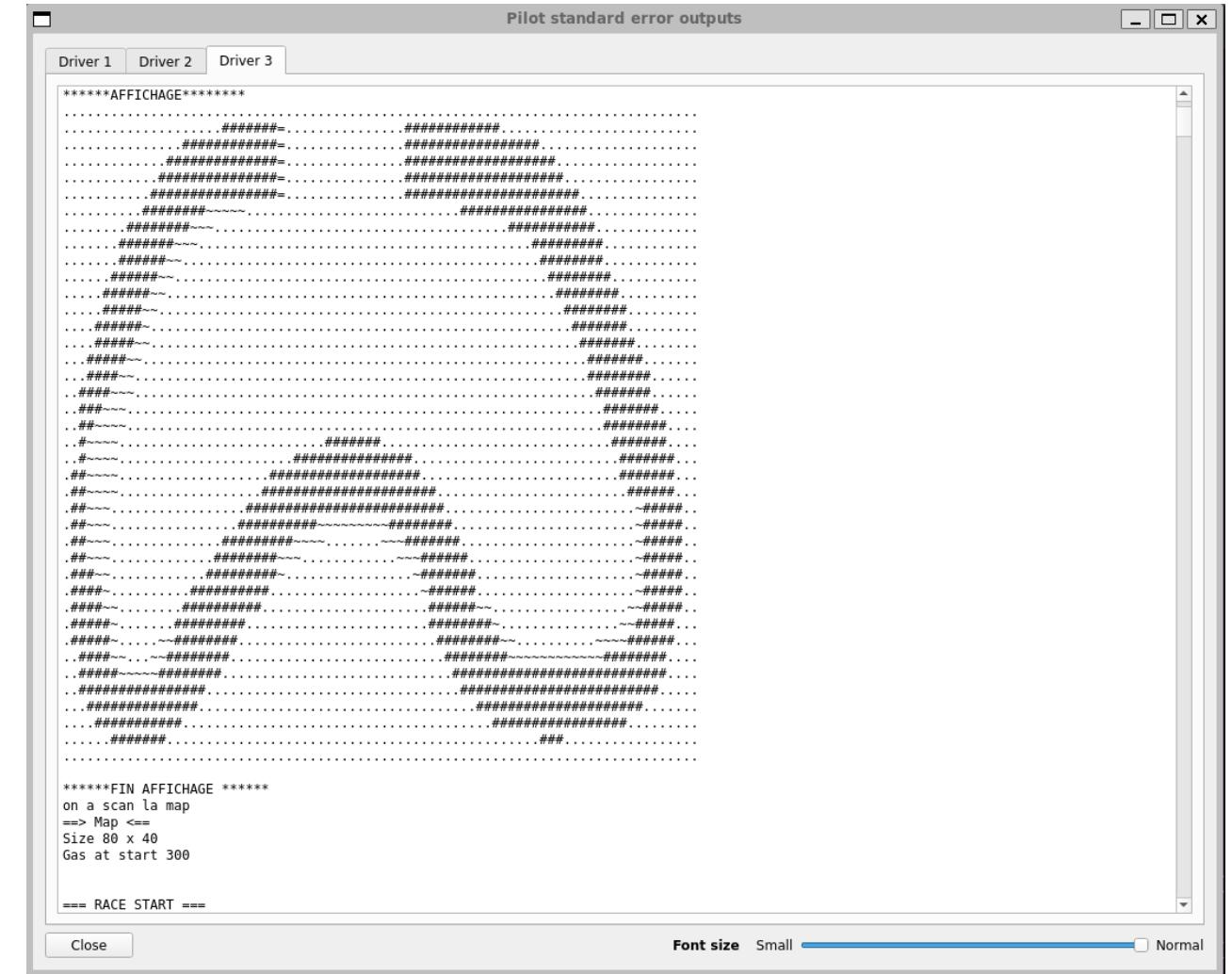
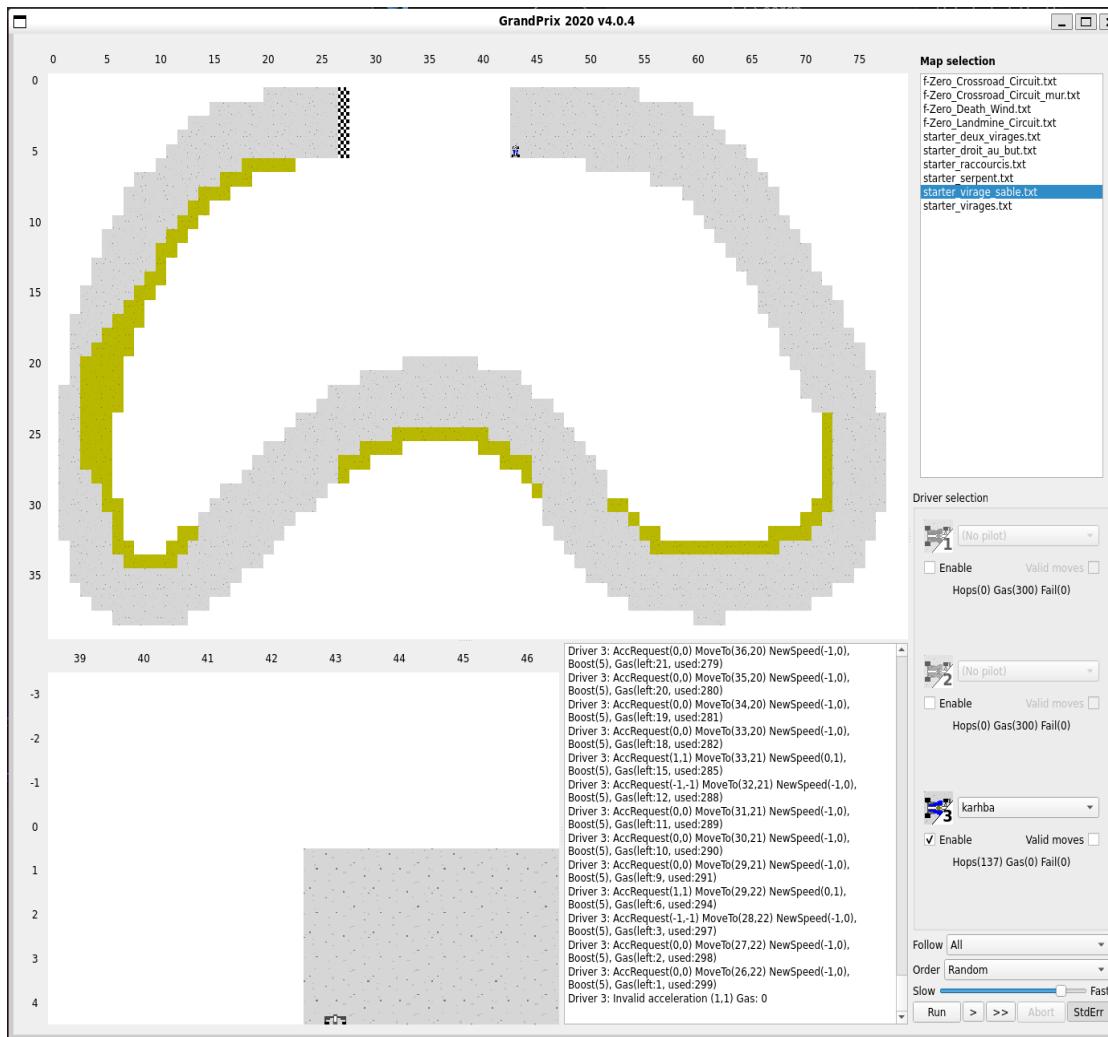
- createHeap
- printHeap
- getElement
- insertHeap
- modifyPriorityHeap
- removeElement



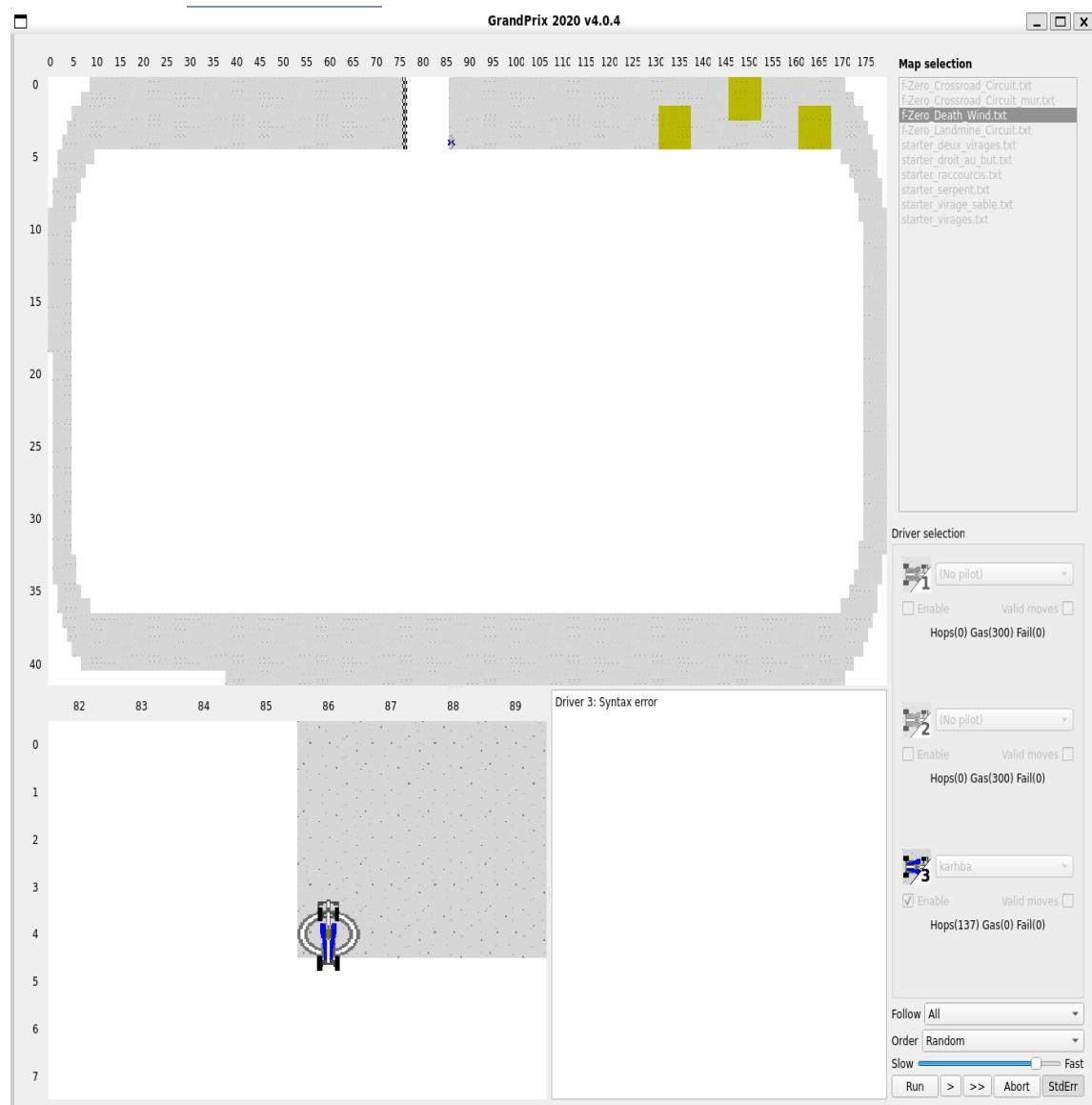
scanMap



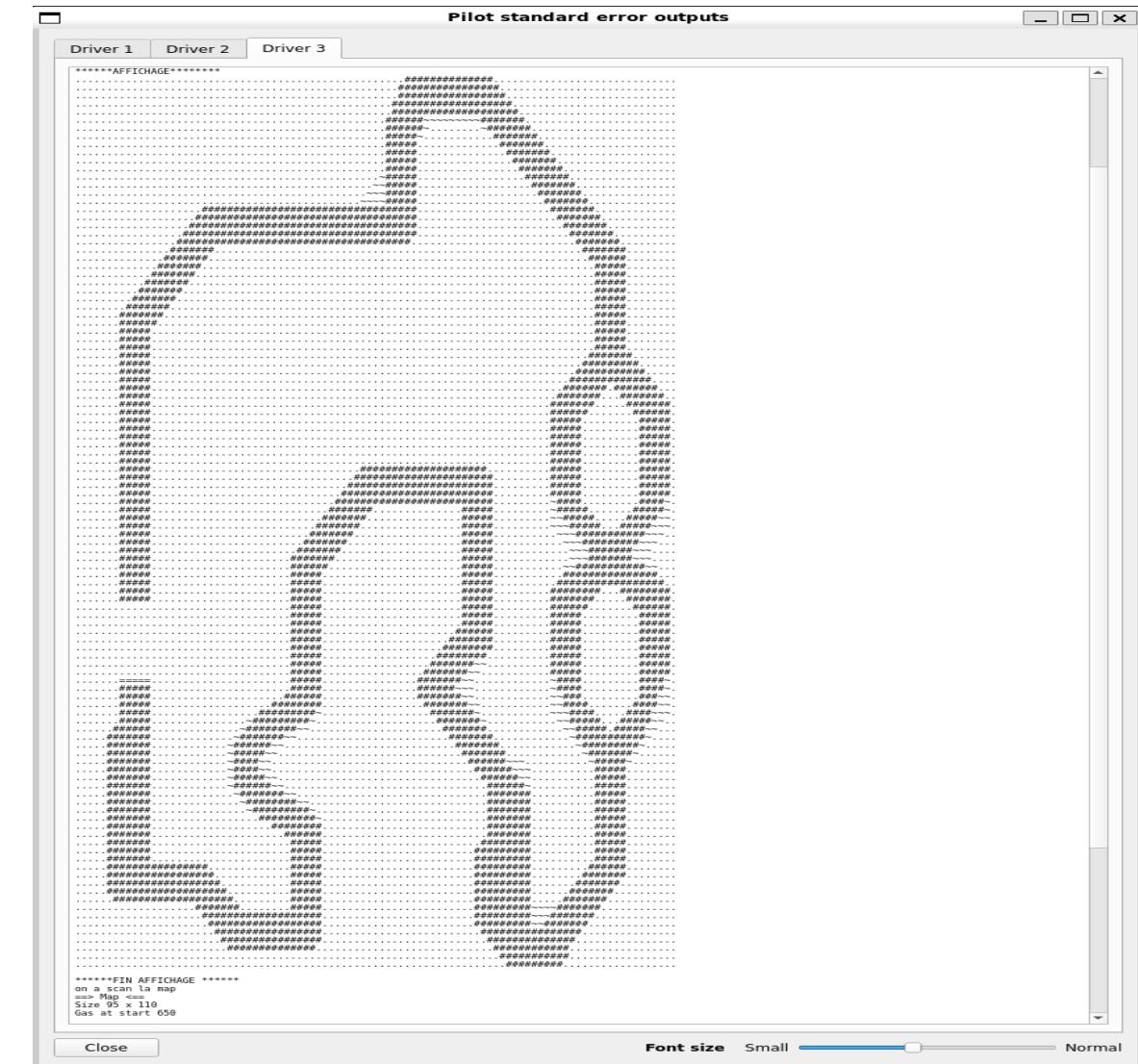
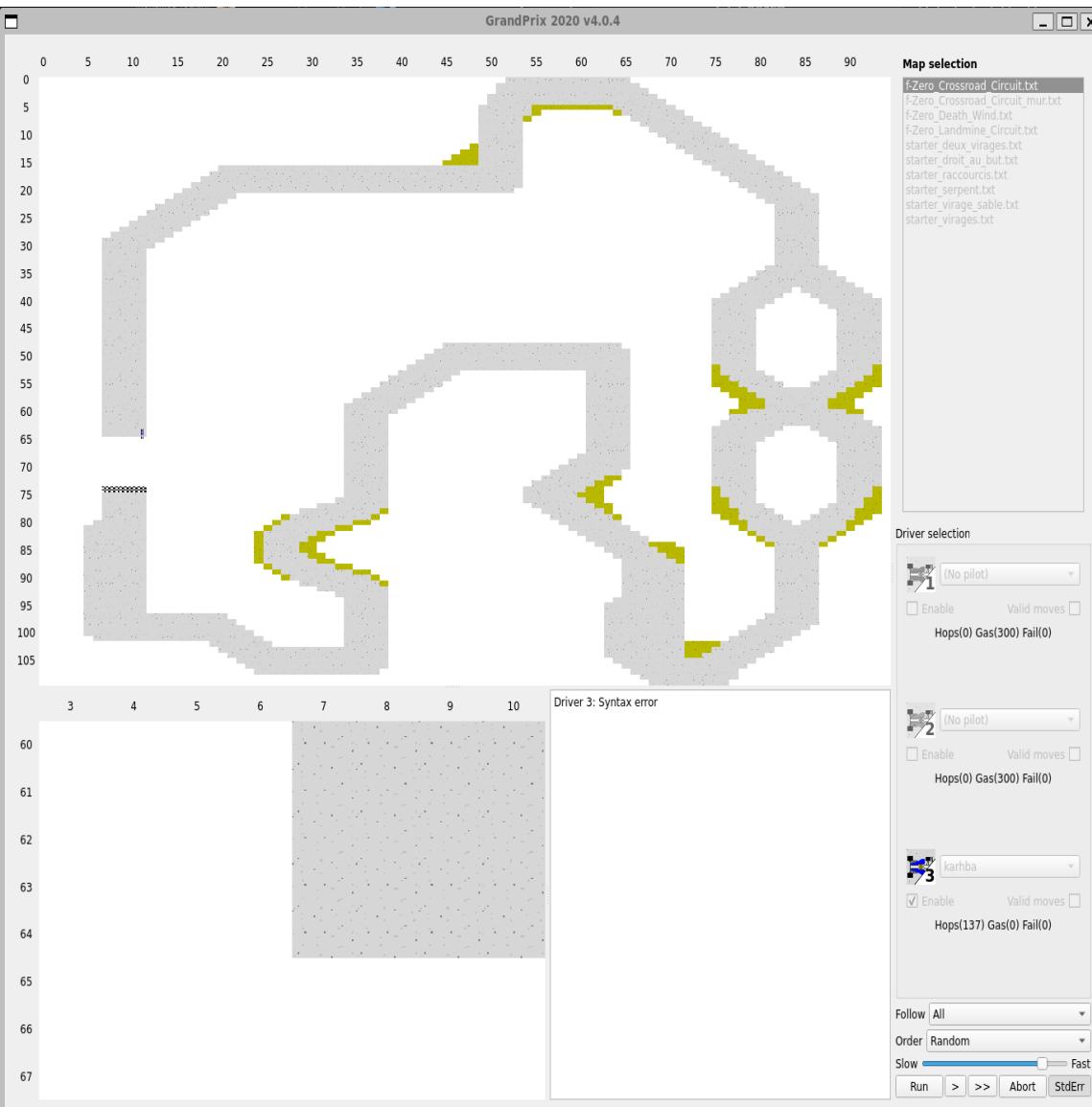
Implémentation et tests de map scanning



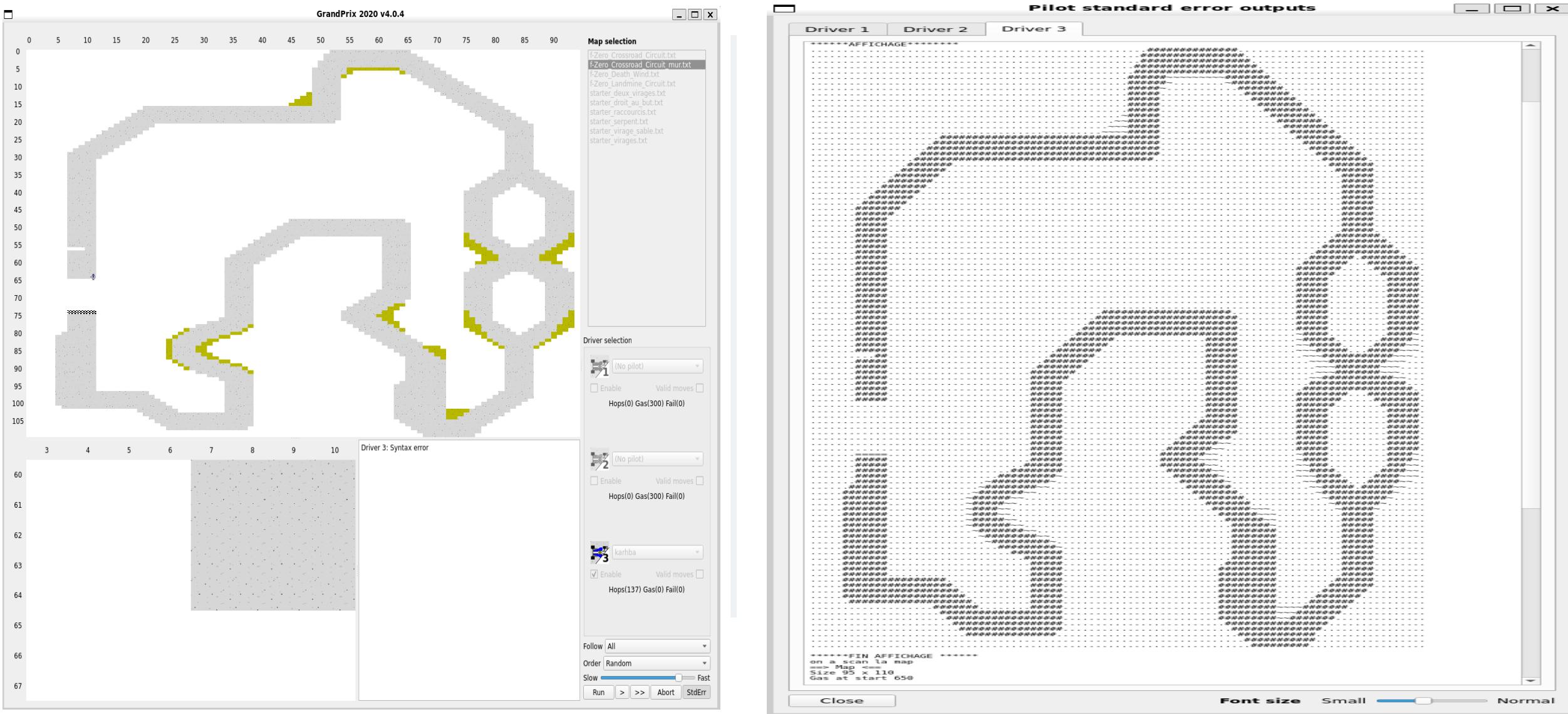
Implémentation et tests de map scanning



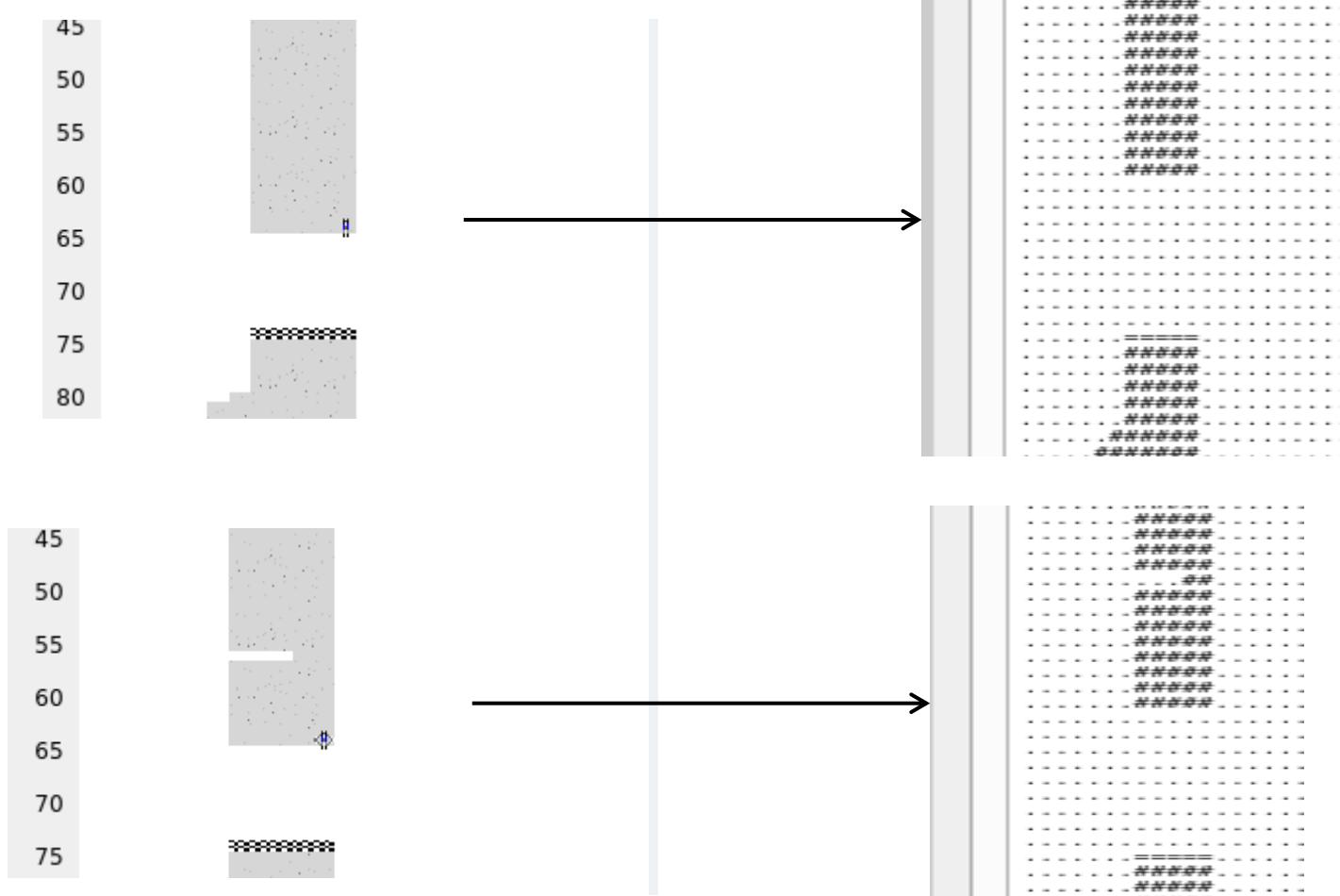
Implémentation et tests de map scanning



Implémentation et tests de map scanning

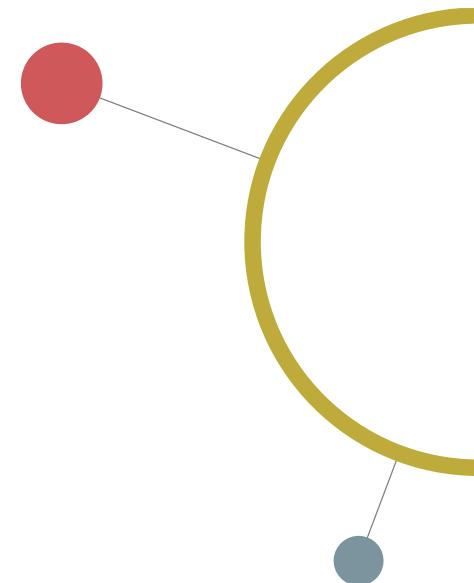


Cas du mur

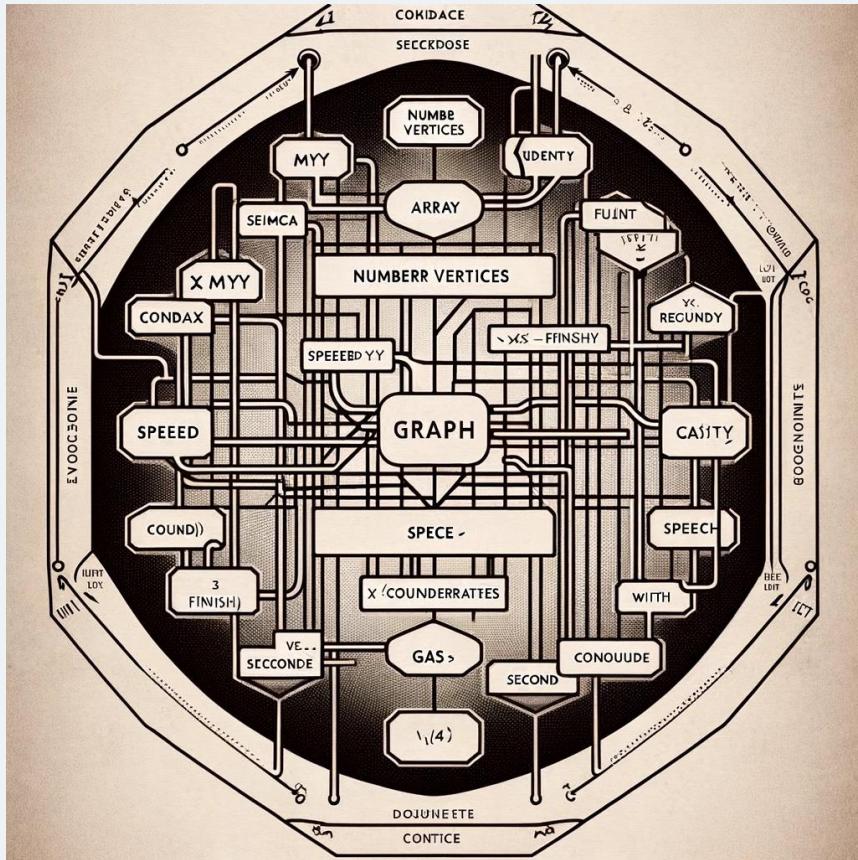




Graph



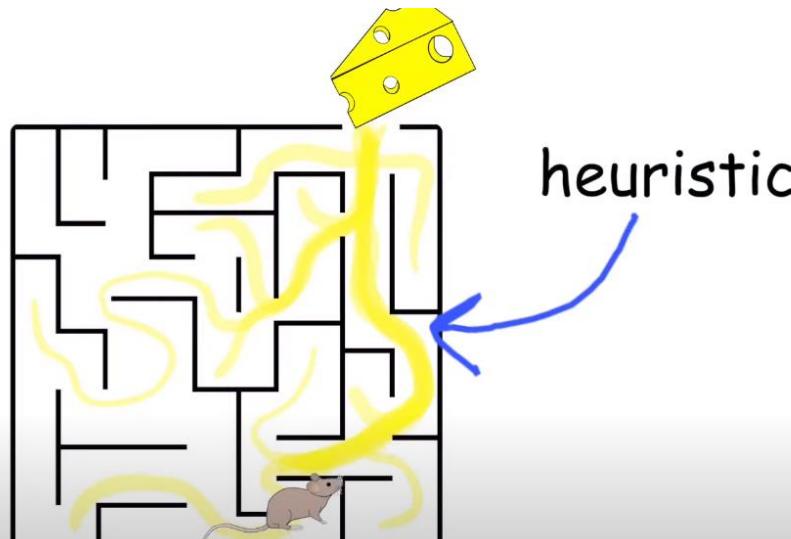
Structure d'un graphe



Implémentation de graphe

- Distance
 - addEdgeInGraph
 - addVertex
 - CreateGraph
 - currentVertex
 - printConsoleGraph
 - printStderrGraph
 - drawGraph
 - Tchebychev
 - Astar
 - updateHeuristic

Astar



A^{*}(G=(V,E), w, s, s') :

open = file de priorité ordonnée par $f[t] = d[t] + h[t]$
contenant s au départ

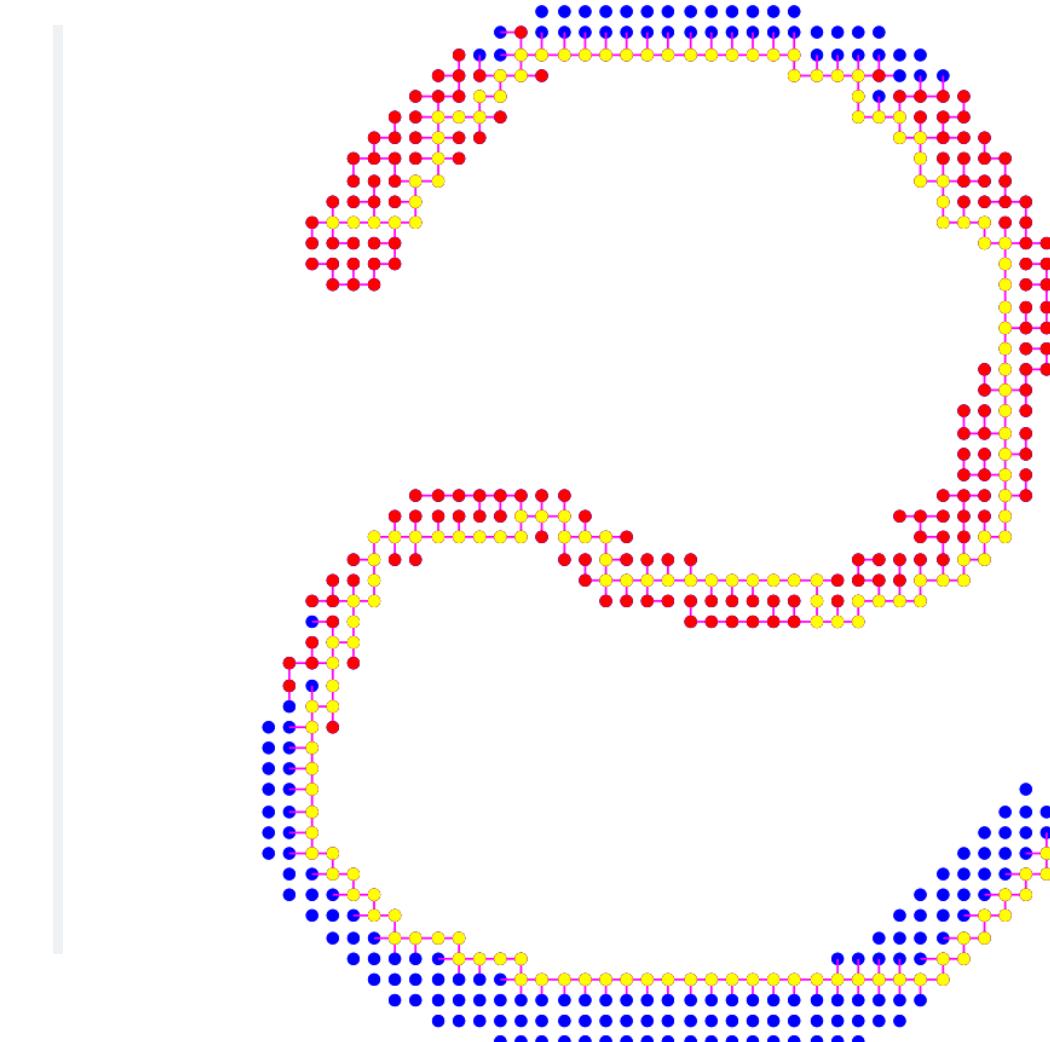
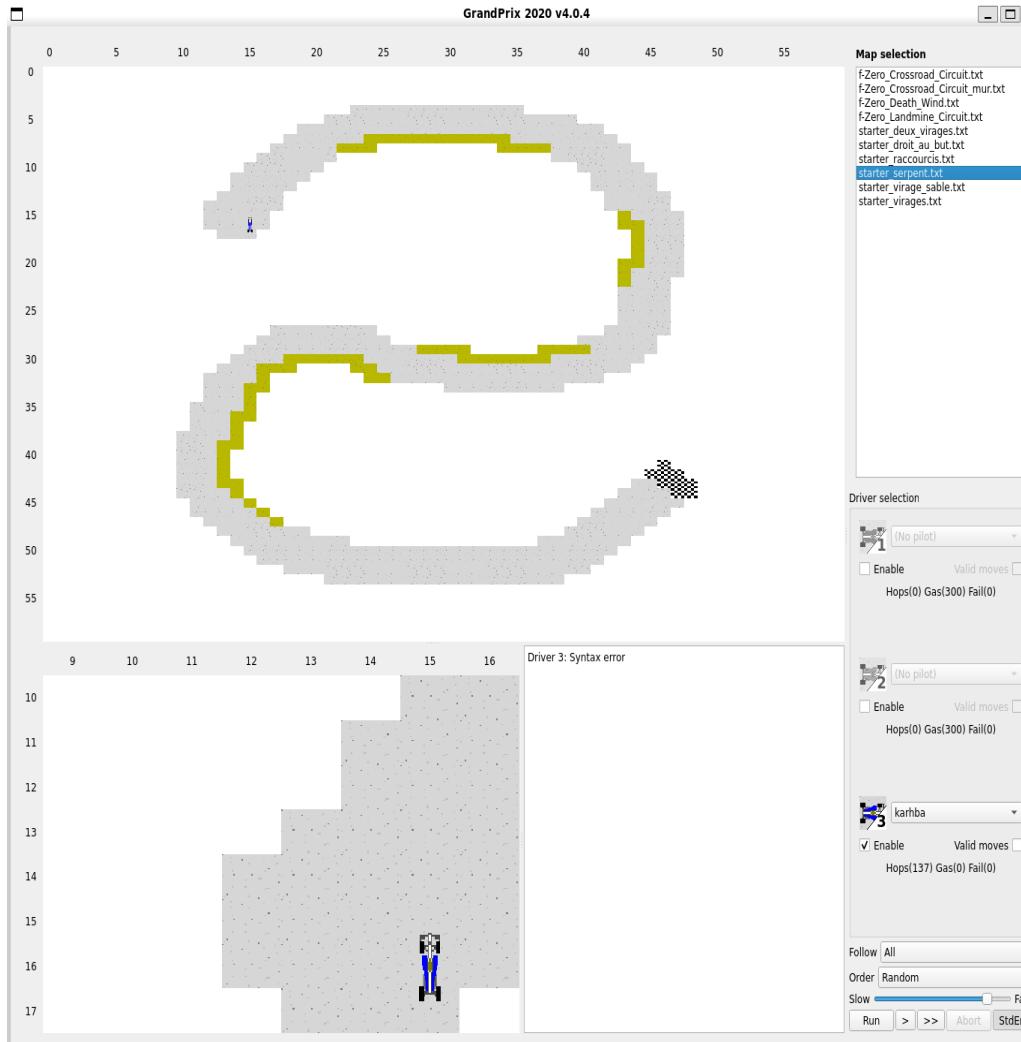
closed = ensemble vide

Tant que open n'est pas vide

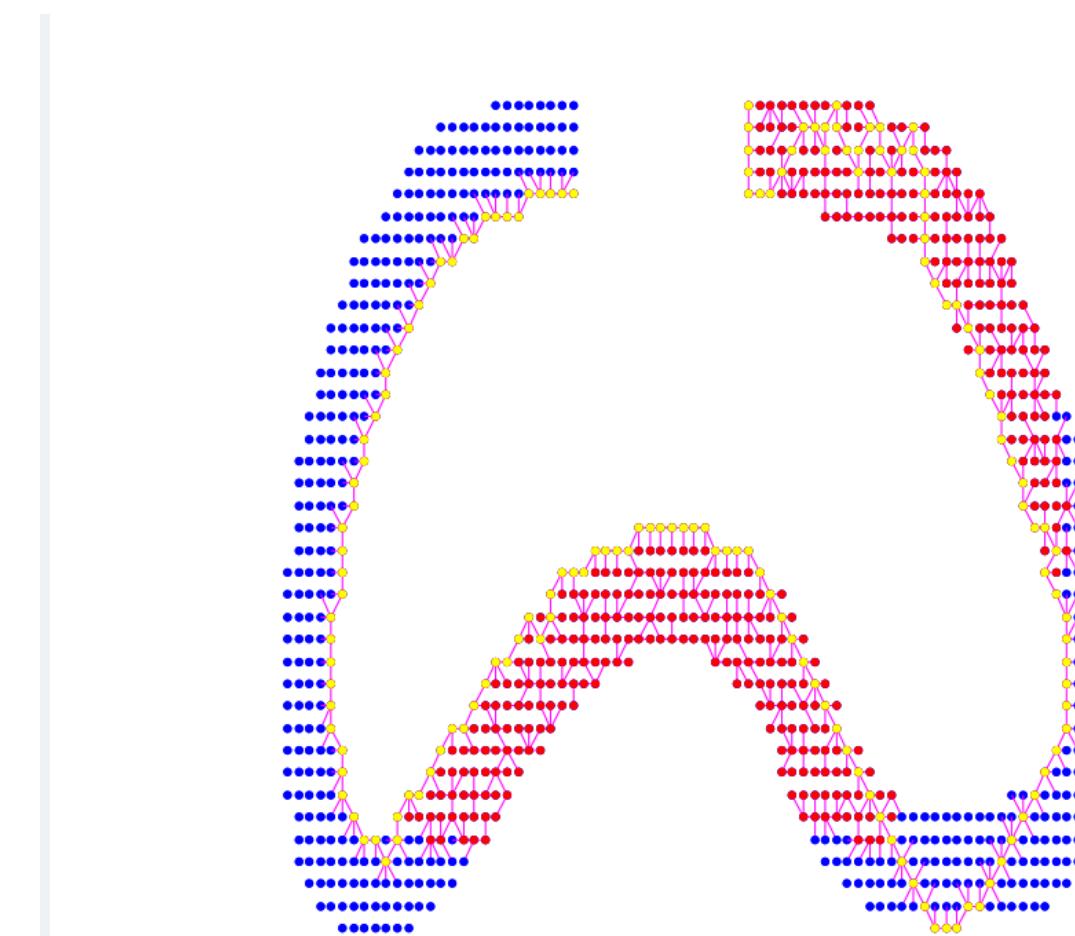
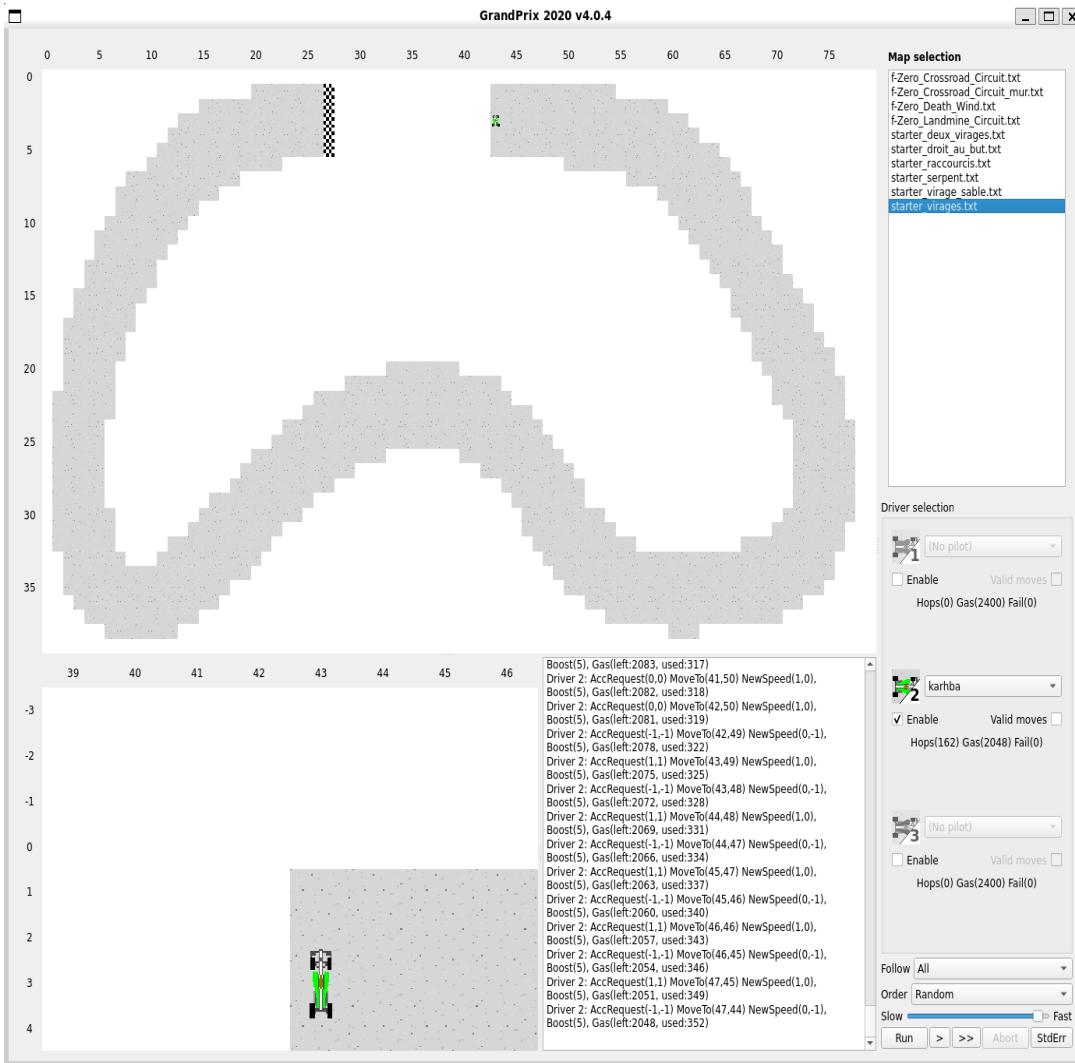
- | t = Défiler(open)
- | ajouter t à closed
- | si t = s' alors retourner d[s']
- | Pour tout arc (t,u) de G avec u pas dans closed :
- | | si $d[u]$ n'existe pas ou $d[u] > d[t] + w(t,u)$:
- | | | $d[u] = d[t] + w(t,u)$
- | | Calculer $h[u]$ si nécessaire
- | | ajouter u à open s'il n'y est pas

Retourner une erreur

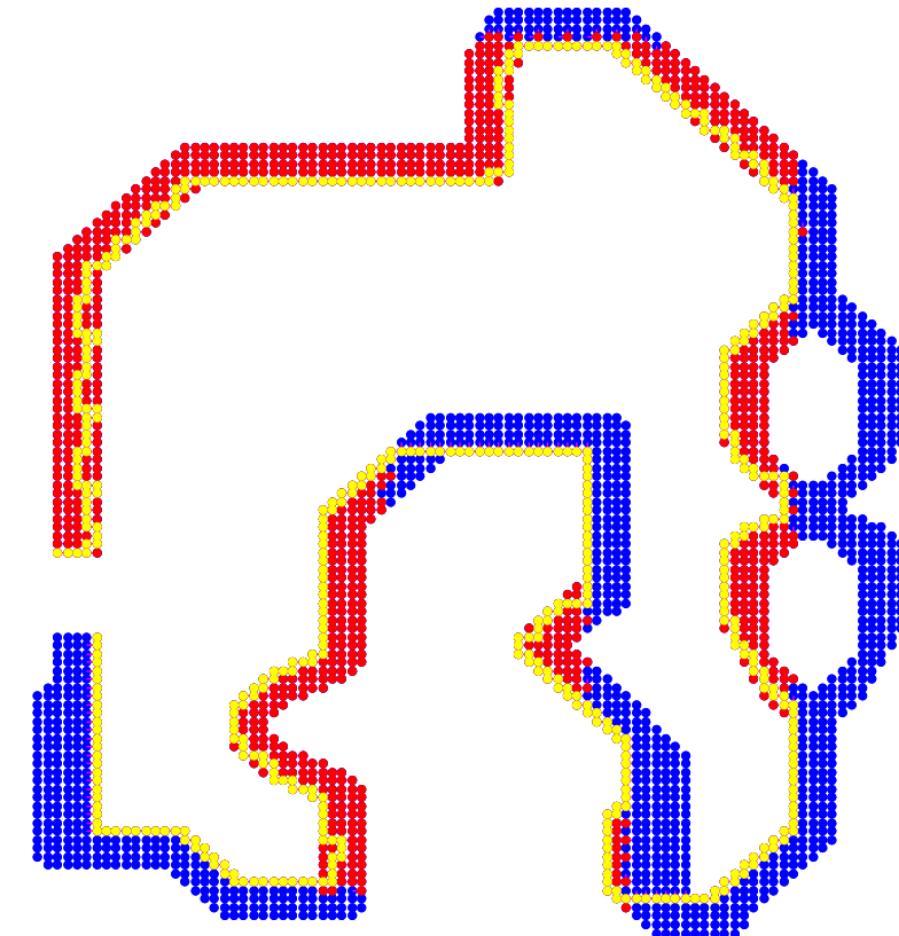
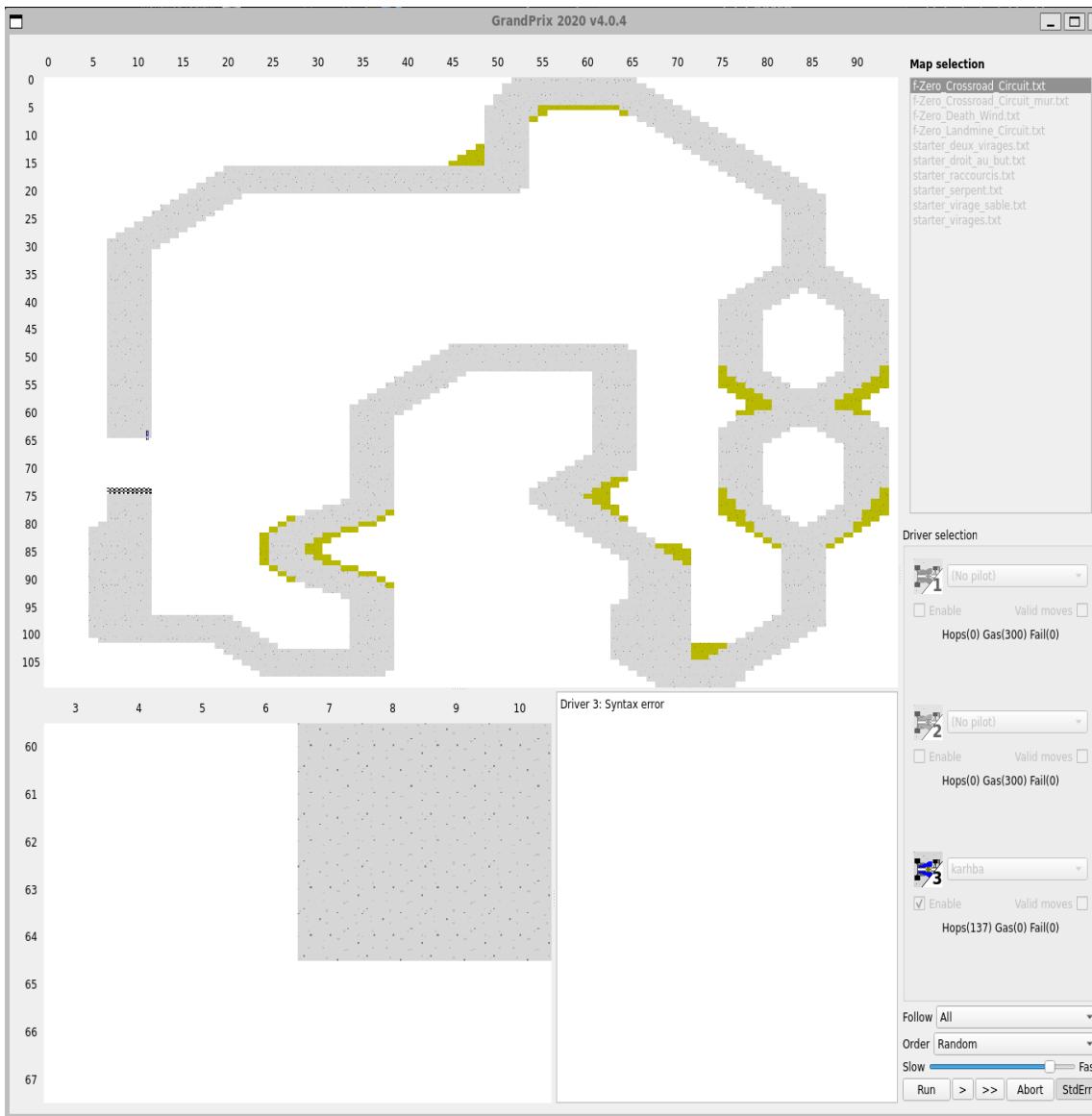
Quelques test de A* : visualisation graphique

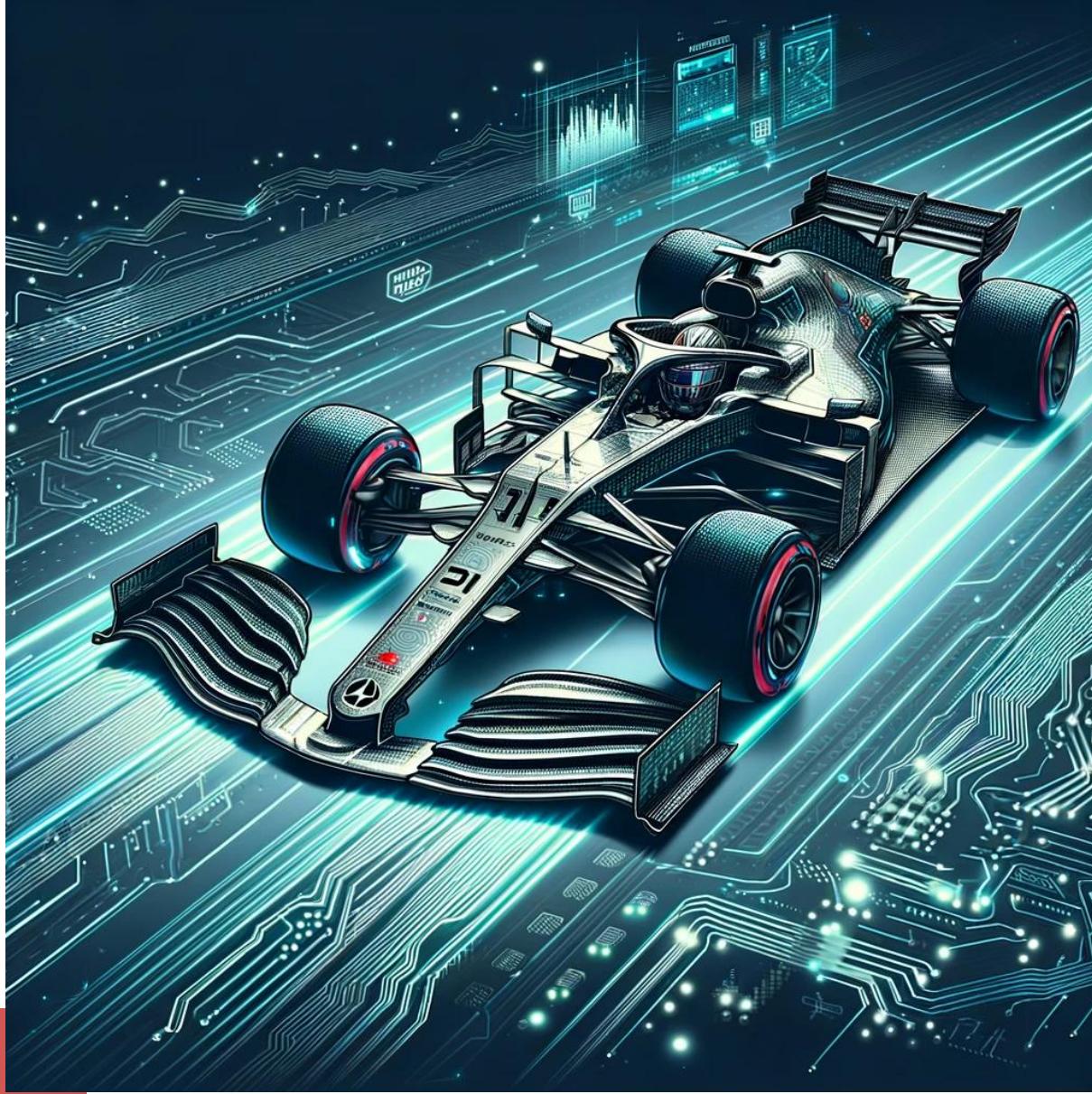


Quelques test de A* : visualisation graphique

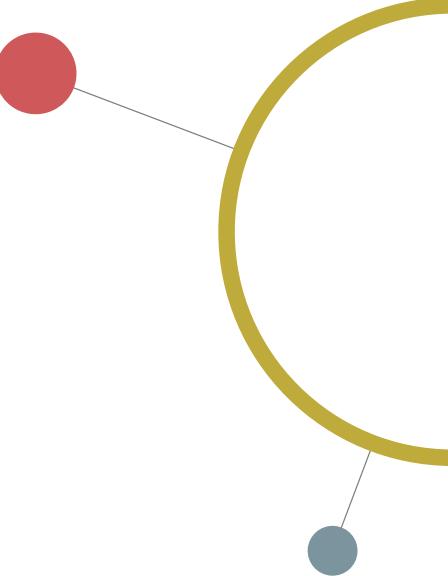


Quelques test de A* : visualisation graphique





Pilot



Implémentation du pilote

- Gestion des crashes
 - Gestion du mouvement dans le sable
 - Lecture des positions des autres pilotes
 - Calcul des (x, y); (xv, xy); (ax, ay)
 - Communication avec le GDC
-
- updatePilotsPositions
 - updateSpeed
 - isCaseValid
 - isNeighbor
 - isCaseOccupied
 - requestAcceleration



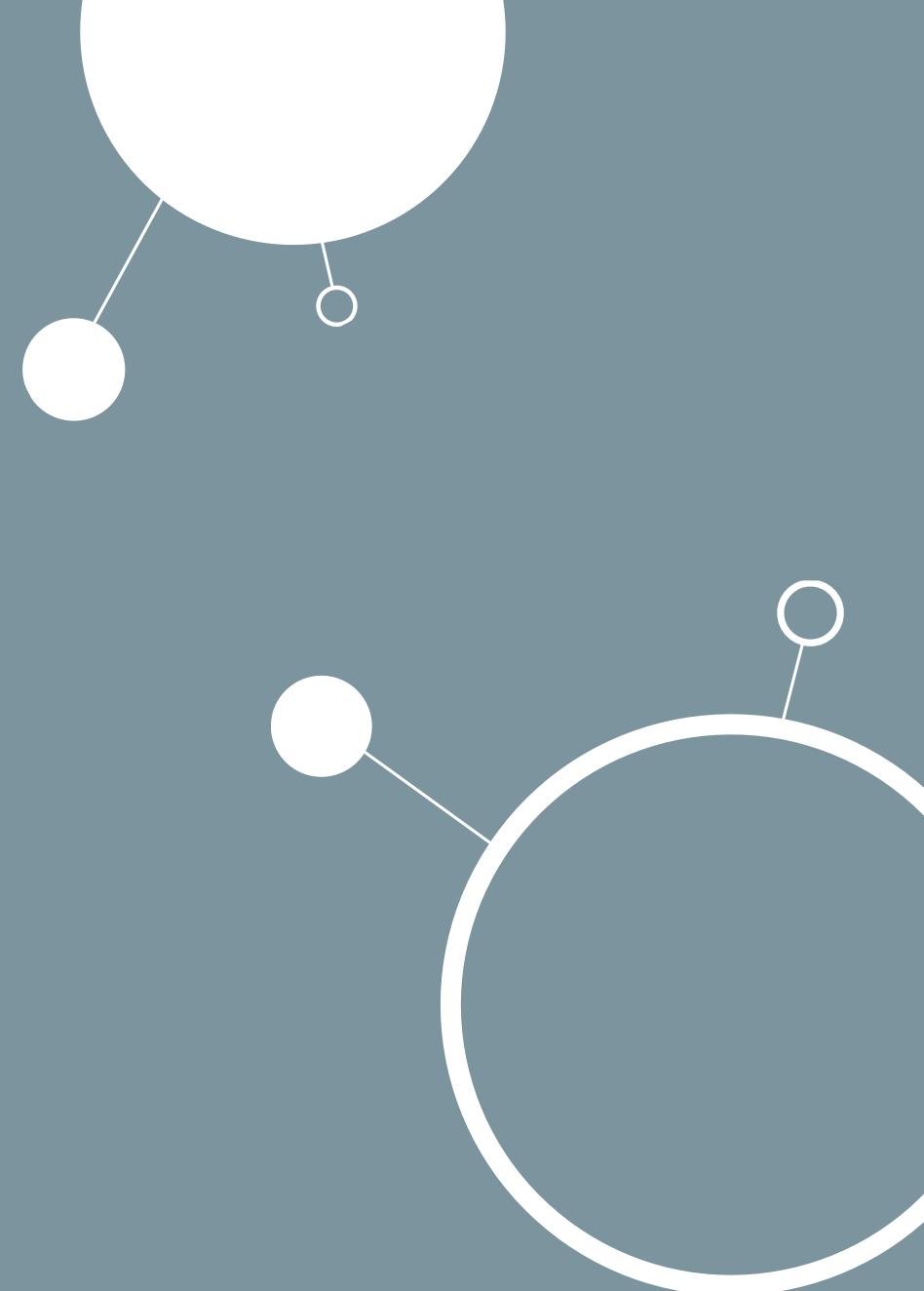
LINKING...



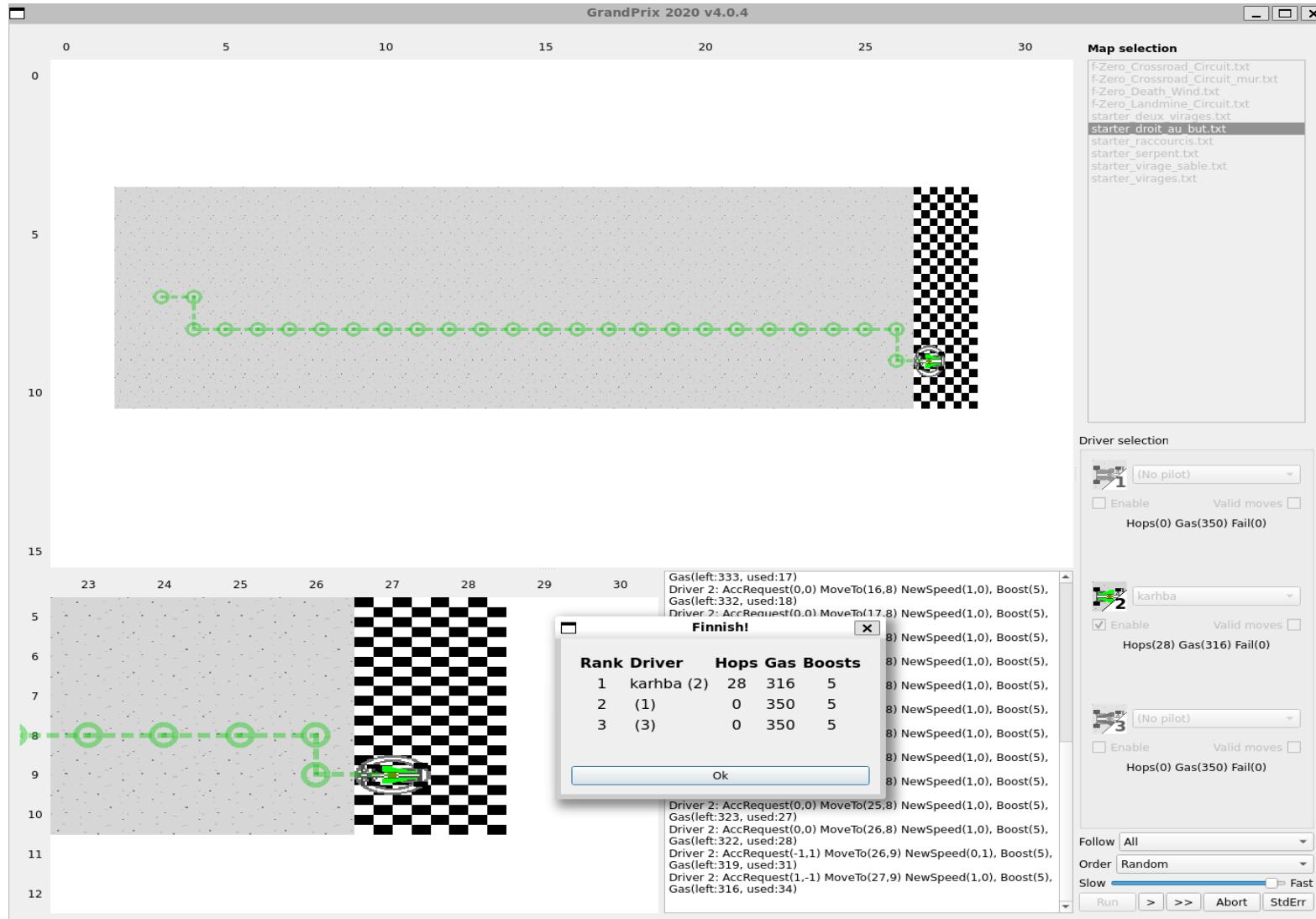
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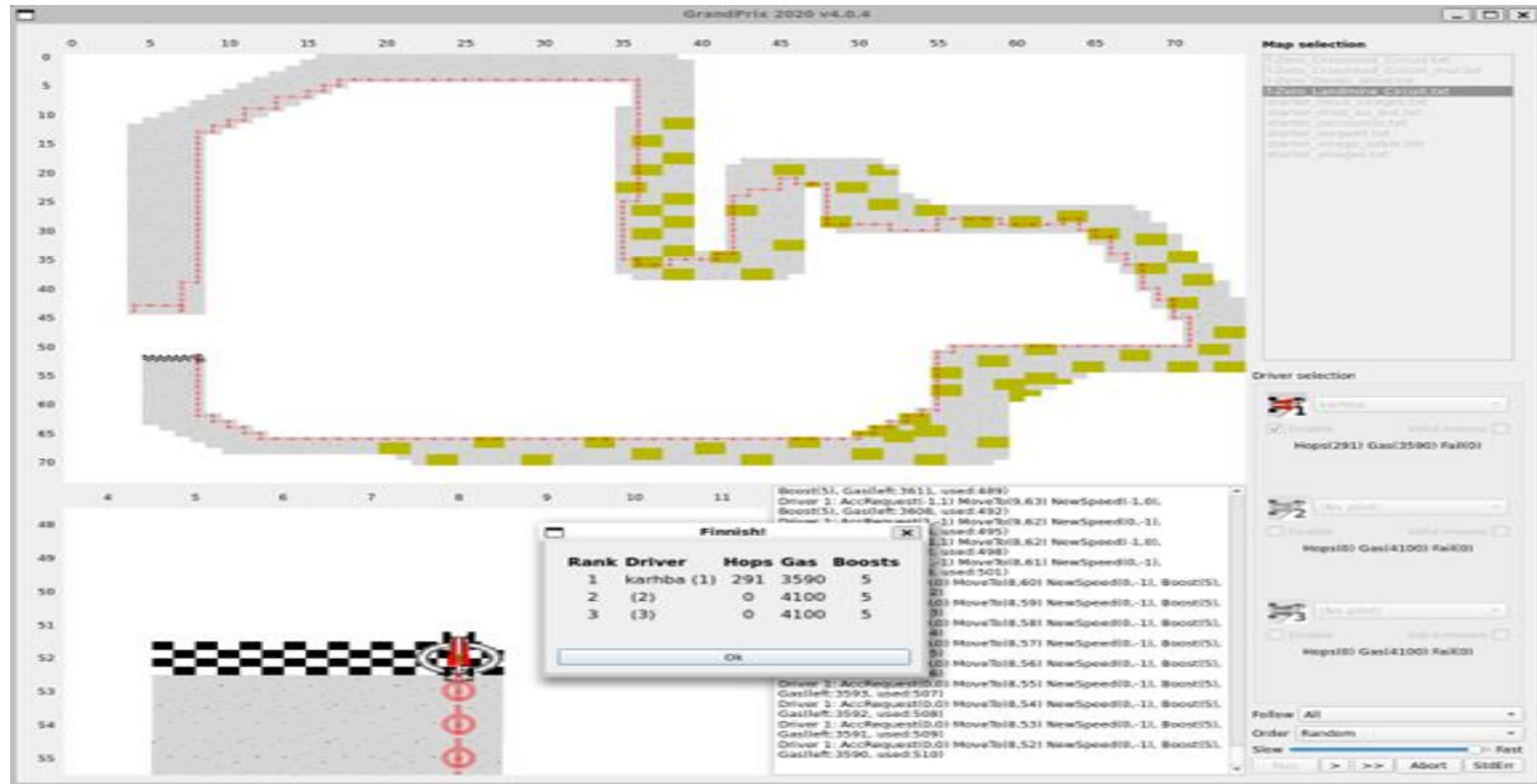
Karhba

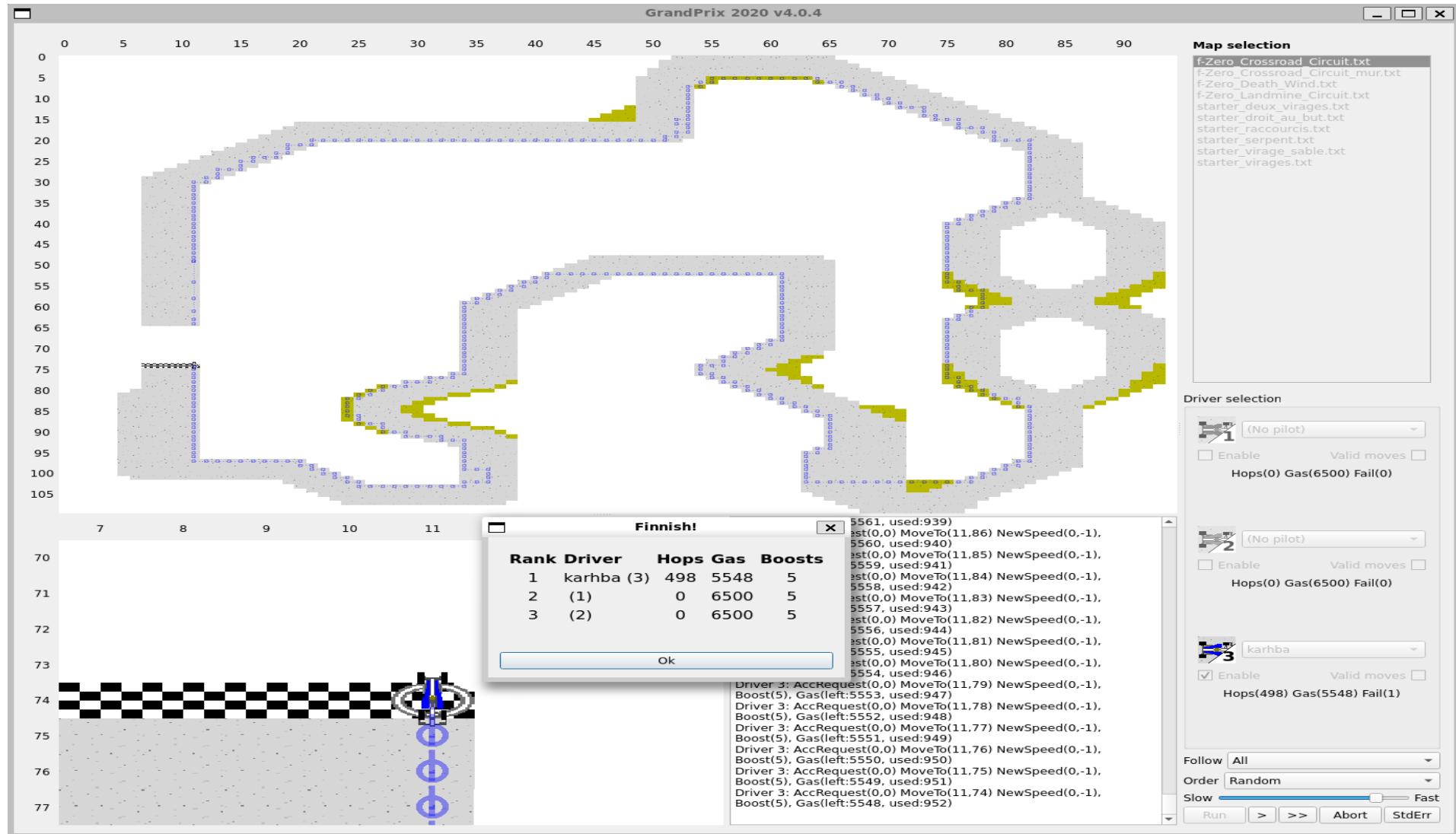
F1



Karhba (avant la gestion du gaz)





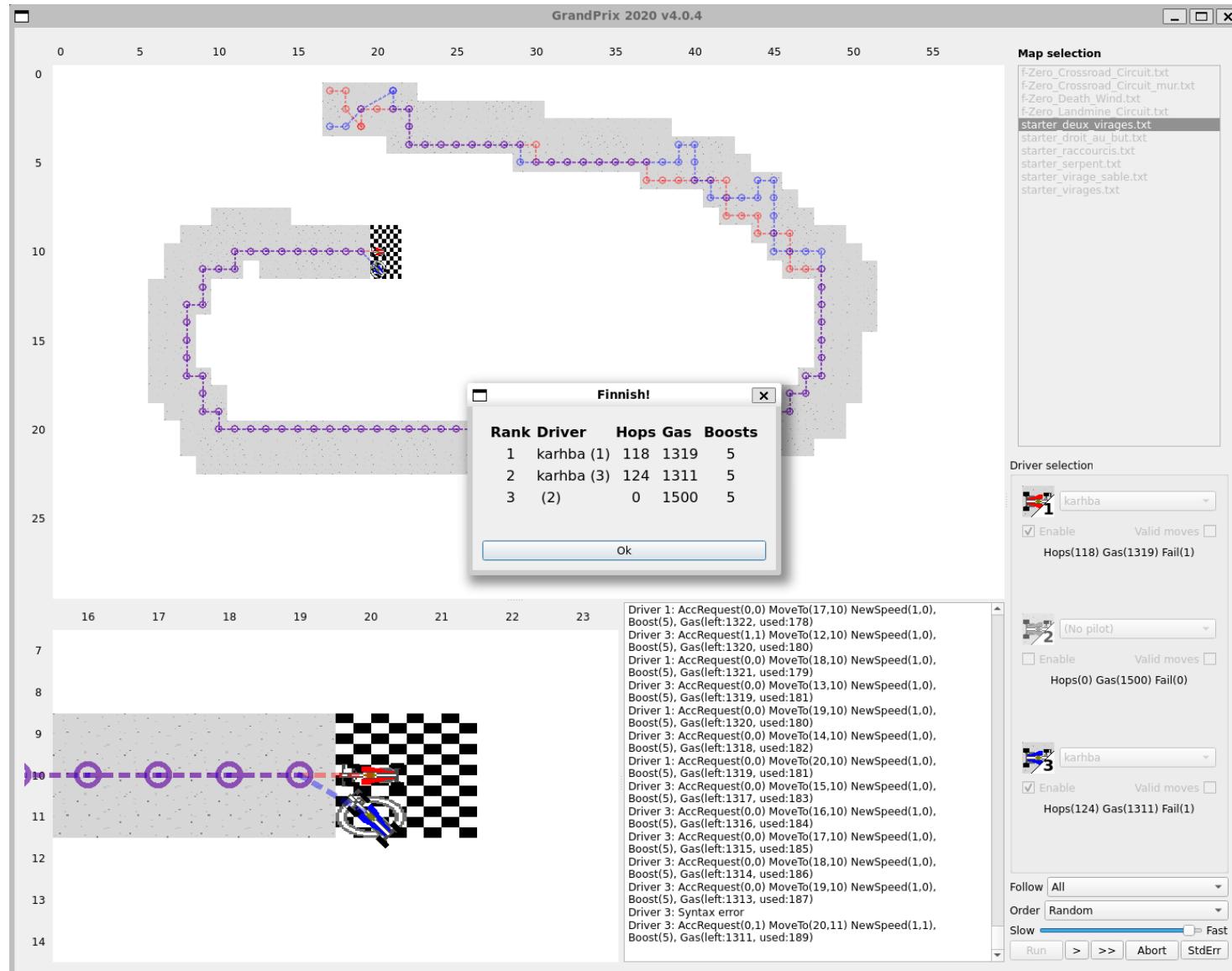


TEST

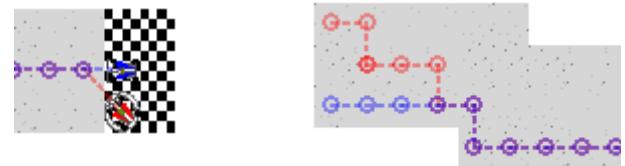
Karhba vs Karhba

Test de performances

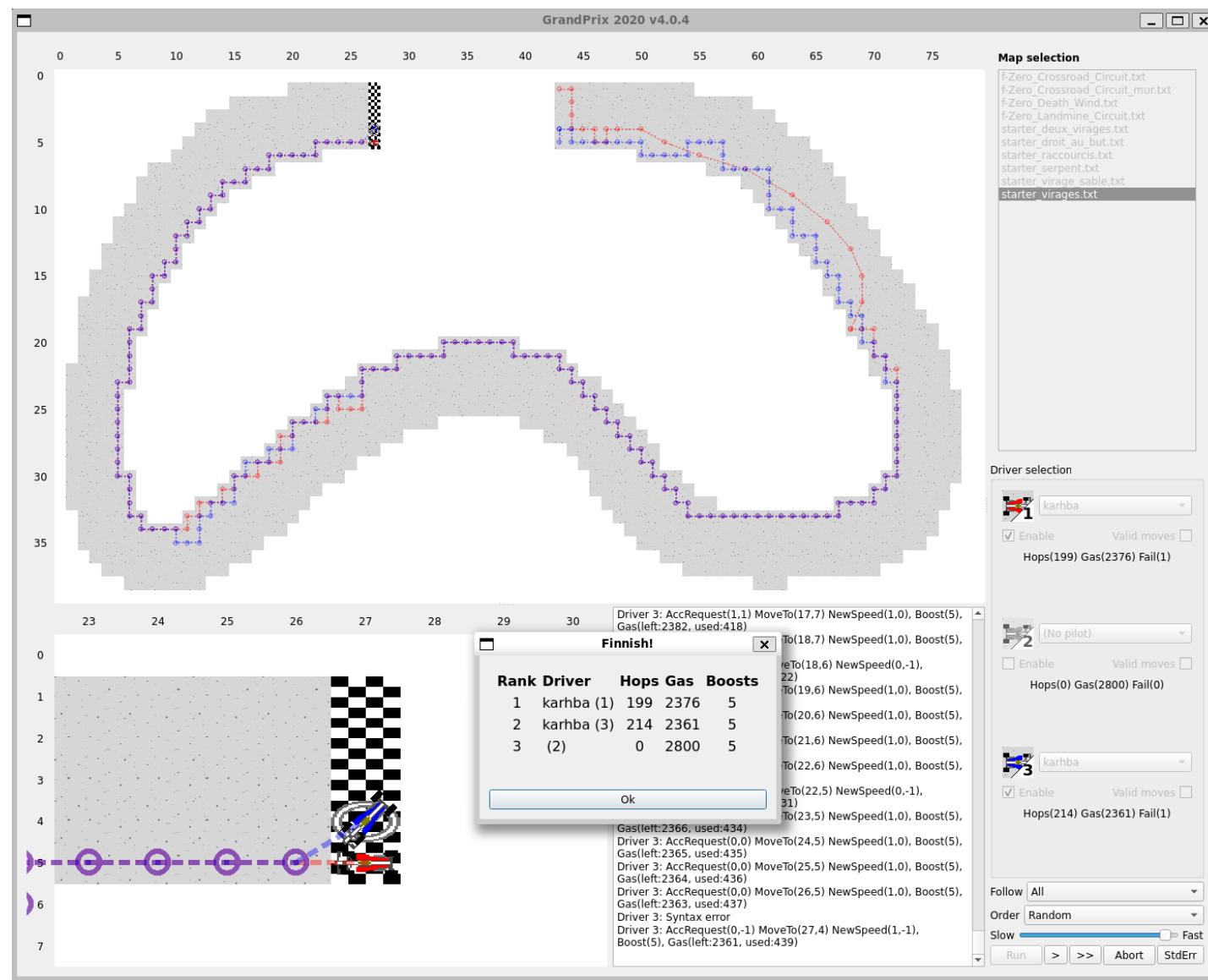
TEST : KARHBA VS KARHBA



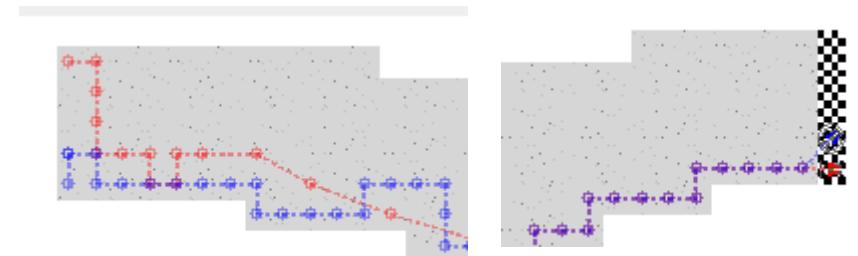
AREAS OF INTEREST



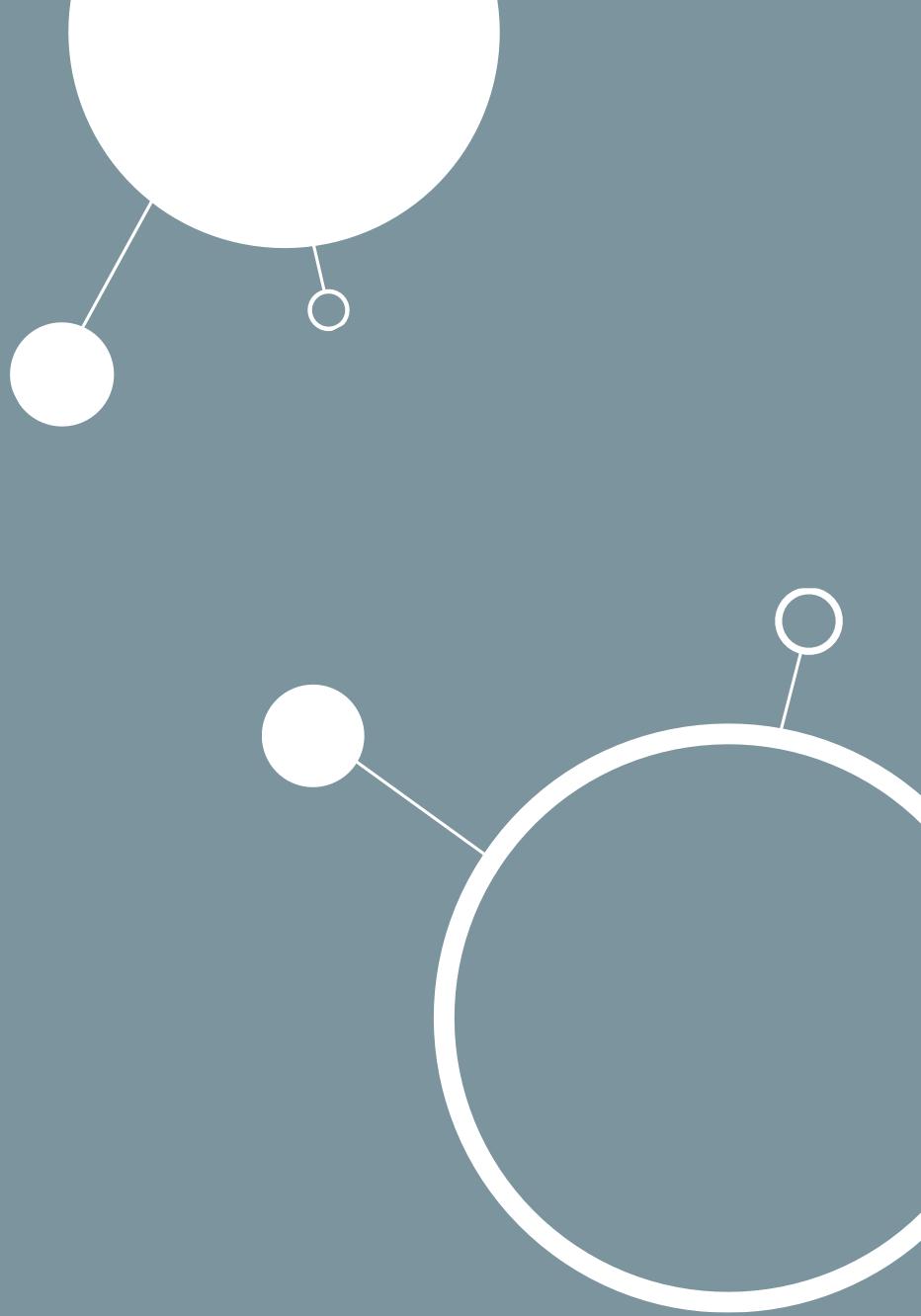
TEST : KARHBA VS KARHBA



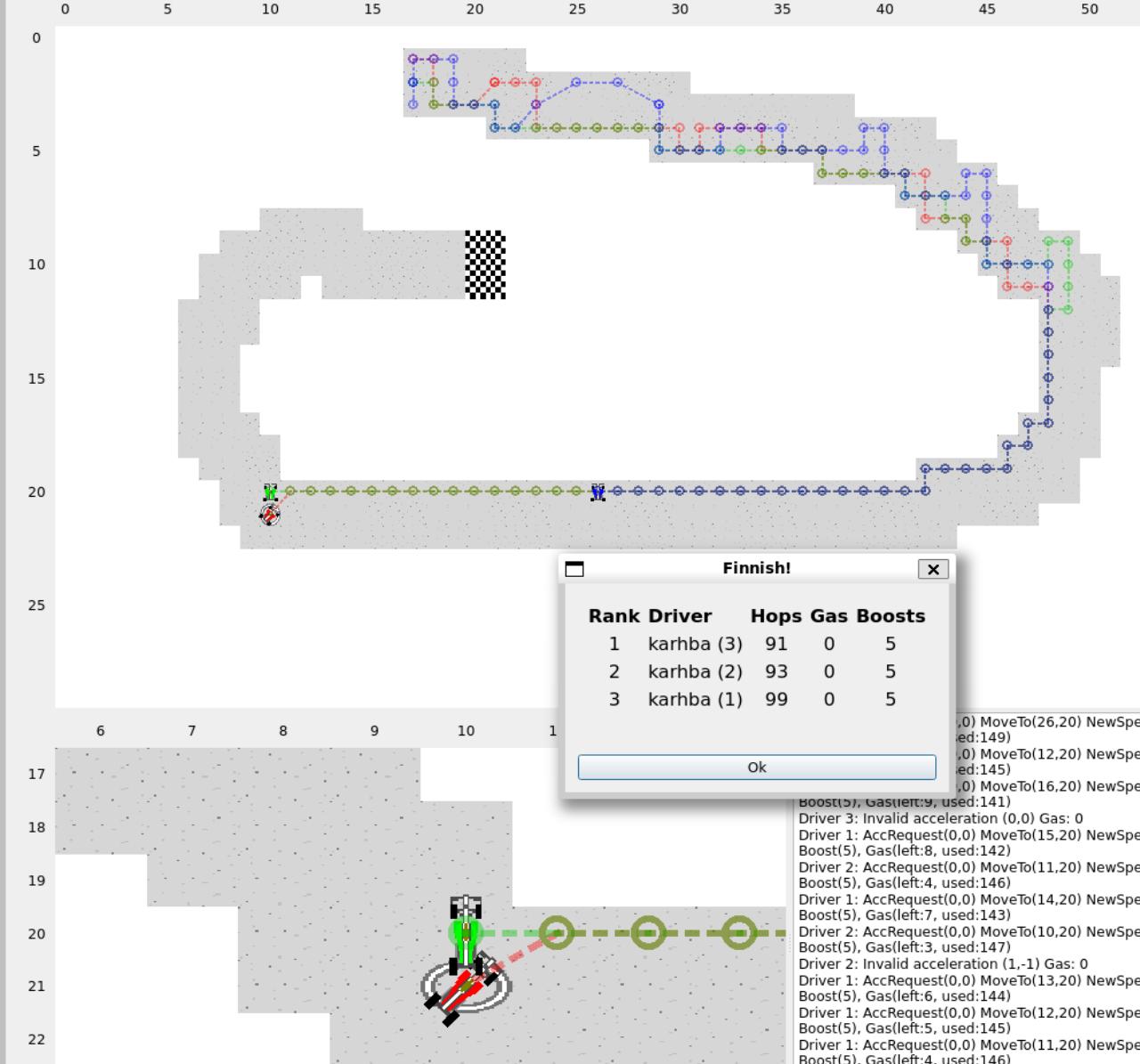
AREAS OF INTEREST



Gestion du Gas



GrandPrix 2020 v4.0.4



Map selection

- f-Zero_Crossroad_Circuit.txt
- f-Zero_Crossroad_Circuit_mur.txt
- f-Zero_Death_Wind.txt
- f-Zero_Landmine Circuit.txt
- starter_deux_virages.txt**
- starter_droit_au_but.txt
- starter_raccourcis.txt
- starter_serpent.txt
- starter_virage_sable.txt
- starter_virages.txt

Driver selection

 karhba	<input checked="" type="checkbox"/> Enable	<input type="checkbox"/> Valid moves
Hops(99) Gas(0) Fail(1)		
 karhba	<input checked="" type="checkbox"/> Enable	<input type="checkbox"/> Valid moves
Hops(93) Gas(0) Fail(0)		
 karhba	<input checked="" type="checkbox"/> Enable	<input type="checkbox"/> Valid moves
Hops(91) Gas(0) Fail(1)		

Follow: All

Order: Random

Slow Fast

Run > >> Abort StdErr

```

.Finish!
Rank Driver    Hops Gas Boosts
1  karhba (3)  91   0   5
2  karhba (2)  93   0   5
3  karhba (1)  99   0   5
Ok
Boost(5), Gas(left:9, used:141)
Driver 3: Invalid acceleration (0,0) Gas: 0
Driver 1: AccRequest(0,0) MoveTo(15,20) NewSpeed(-1,0),
Boost(5), Gas(left:8, used:142)
Driver 2: AccRequest(0,0) MoveTo(11,20) NewSpeed(-1,0),
Boost(5), Gas(left:4, used:146)
Driver 1: AccRequest(0,0) MoveTo(14,20) NewSpeed(-1,0),
Boost(5), Gas(left:7, used:143)
Driver 2: AccRequest(0,0) MoveTo(10,20) NewSpeed(-1,0),
Boost(5), Gas(left:3, used:147)
Driver 2: Invalid acceleration (1,-1) Gas: 0
Driver 1: AccRequest(0,0) MoveTo(13,20) NewSpeed(-1,0),
Boost(5), Gas(left:6, used:144)
Driver 1: AccRequest(0,0) MoveTo(12,20) NewSpeed(-1,0),
Boost(5), Gas(left:5, used:145)
Driver 1: AccRequest(0,0) MoveTo(11,20) NewSpeed(-1,0),
Boost(5), Gas(left:4, used:146)
Driver 1: Syntax error
Driver 1: AccRequest(0,1) MoveTo(10,21) NewSpeed(-1,1),
Boost(5), Gas(left:2, used:148)
Driver 1: Syntax error
Driver 1: Invalid acceleration (-1,0) Gas: 0

```

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pour votre écoute



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