


```
In[3]:= Import [
  "http://cruciverbiste.com/wp-content/uploads/2013/03/grille-sudoku.gif"]
```

		4			8	7		
	4	7		9	2		5	
2			6				3	
9	7		5			2		3
5		8		2	4	7		6
6		4			7		8	5
	9		3		8			7
		3	2	4		1	6	
	1	2					9	

```
Out[3]=
```

```
In[4]:= L1 = {Null, Null, Null, 4, Null, Null, 8, 7, Null}
```

```
Out[4]= {Null, Null, Null, 4, Null, Null, 8, 7, Null}
```

```
In[5]:= L2 = {Null, 4, 7, Null, 9, 2, Null, 5, Null}
```

```
Out[5]= {Null, 4, 7, Null, 9, 2, Null, 5, Null}
```

```
In[6]:= L3 = {2, Null, Null, 6, Null, Null, Null, 3, Null}
```

```
Out[6]= {2, Null, Null, 6, Null, Null, Null, 3, Null}
```

```
In[7]:= L4 = {9, 7, Null, 5, Null, Null, 2, Null, 3}
```

```
Out[7]= {9, 7, Null, 5, Null, Null, 2, Null, 3}
```

```
In[8]:= L5 = {5, Null, 8, Null, 2, 4, 7, Null, 6}
```

```
Out[8]= {5, Null, 8, Null, 2, 4, 7, Null, 6}
```

```
In[9]:= L6 = {6, Null, 4, Null, Null, 7, Null, 8, 5}
```

```
Out[9]= {6, Null, 4, Null, Null, 7, Null, 8, 5}
```

```
In[10]:= L7 = {Null, 9, Null, 3, Null, 8, Null, Null, 7}
```

```
Out[10]= {Null, 9, Null, 3, Null, 8, Null, Null, 7}
```

```
In[11]:= L8 = {Null, Null, 3, 2, 4, Null, 1, 6, Null}
```

```
Out[11]= {Null, Null, 3, 2, 4, Null, 1, 6, Null}
```

```
In[12]:= L9 = {Null, 1, 2, Null, Null, Null, Null, 9, Null}
```

```
Out[12]= {Null, 1, 2, Null, Null, Null, Null, 9, Null}
```

```
In[13]:= MF = MatrixForm
```

```
Out[13]= MatrixForm
```

```
In[14]= M = {L1, L2, L3, L4, L5, L6, L7, L8, L9}
```

```
Out[14]= {{Null, Null, Null, 4, Null, Null, 8, 7, Null},
  {Null, 4, 7, Null, 9, 2, Null, 5, Null},
  {2, Null, Null, 6, Null, Null, Null, 3, Null},
  {9, 7, Null, 5, Null, Null, 2, Null, 3},
  {5, Null, 8, Null, 2, 4, 7, Null, 6}, {6, Null, 4, Null, Null, 7, Null, 8, 5},
  {Null, 9, Null, 3, Null, 8, Null, Null, 7}, {Null, Null, 3, 2, 4, Null, 1, 6, Null},
  {Null, 1, 2, Null, Null, Null, Null, 9, Null}}
```

Nous considérons notre grille comme une matrice dans laquelle certains coefficients sont déjà déterminés.

```
In[15]=
```

```
In[16]= tp = Position [M, _Integer]
```

```
Out[16]= {{1, 4}, {1, 7}, {1, 8}, {2, 2}, {2, 3}, {2, 5}, {2, 6}, {2, 8}, {3, 1}, {3, 4},
  {3, 8}, {4, 1}, {4, 2}, {4, 4}, {4, 7}, {4, 9}, {5, 1}, {5, 3}, {5, 5}, {5, 6},
  {5, 7}, {5, 9}, {6, 1}, {6, 3}, {6, 6}, {6, 8}, {6, 9}, {7, 2}, {7, 4}, {7, 6},
  {7, 9}, {8, 3}, {8, 4}, {8, 5}, {8, 7}, {8, 8}, {9, 2}, {9, 3}, {9, 8}}
```

```
In[17]= initialise[M_] :=
```

```
  ReplacePart[possible, Flatten[Transpose[{tp, Extract[M, tp]}] /.
    ({l_, c_}, v_Integer) :> {{l, c} -> {v}}, 1]]
```

```
In[18]= G = initialise[M]
```

```
Out[18]= {{{1, 2, 3, 4, 5, 6, 7, 8, 9}, {1, 2, 3, 4, 5, 6, 7, 8, 9},
  {1, 2, 3, 4, 5, 6, 7, 8, 9}, {4}, {1, 2, 3, 4, 5, 6, 7, 8, 9},
  {1, 2, 3, 4, 5, 6, 7, 8, 9}, {8}, {7}, {1, 2, 3, 4, 5, 6, 7, 8, 9}},
  {{1, 2, 3, 4, 5, 6, 7, 8, 9}, {4}, {7}, {1, 2, 3, 4, 5, 6, 7, 8, 9}, {9},
  {2}, {1, 2, 3, 4, 5, 6, 7, 8, 9}, {5}, {1, 2, 3, 4, 5, 6, 7, 8, 9}},
  {{2}, {1, 2, 3, 4, 5, 6, 7, 8, 9}, {1, 2, 3, 4, 5, 6, 7, 8, 9},
  {6}, {1, 2, 3, 4, 5, 6, 7, 8, 9}, {1, 2, 3, 4, 5, 6, 7, 8, 9},
  {1, 2, 3, 4, 5, 6, 7, 8, 9}, {3}, {1, 2, 3, 4, 5, 6, 7, 8, 9}},
  {{9}, {7}, {1, 2, 3, 4, 5, 6, 7, 8, 9}, {5}, {1, 2, 3, 4, 5, 6, 7, 8, 9},
  {1, 2, 3, 4, 5, 6, 7, 8, 9}, {2}, {1, 2, 3, 4, 5, 6, 7, 8, 9}, {3}},
  {{5}, {1, 2, 3, 4, 5, 6, 7, 8, 9}, {8}, {1, 2, 3, 4, 5, 6, 7, 8, 9},
  {2}, {4}, {7}, {1, 2, 3, 4, 5, 6, 7, 8, 9}, {6}},
  {{6}, {1, 2, 3, 4, 5, 6, 7, 8, 9}, {4}, {1, 2, 3, 4, 5, 6, 7, 8, 9},
  {1, 2, 3, 4, 5, 6, 7, 8, 9}, {7}, {1, 2, 3, 4, 5, 6, 7, 8, 9}, {8}, {5}},
  {{1, 2, 3, 4, 5, 6, 7, 8, 9}, {9}, {1, 2, 3, 4, 5, 6, 7, 8, 9},
  {3}, {1, 2, 3, 4, 5, 6, 7, 8, 9}, {8},
  {1, 2, 3, 4, 5, 6, 7, 8, 9}, {1, 2, 3, 4, 5, 6, 7, 8, 9}, {7}},
  {{1, 2, 3, 4, 5, 6, 7, 8, 9}, {1, 2, 3, 4, 5, 6, 7, 8, 9}, {3}, {2}, {4},
  {1, 2, 3, 4, 5, 6, 7, 8, 9}, {1}, {6}, {1, 2, 3, 4, 5, 6, 7, 8, 9}},
  {{1, 2, 3, 4, 5, 6, 7, 8, 9}, {1}, {2}, {1, 2, 3, 4, 5, 6, 7, 8, 9},
  {1, 2, 3, 4, 5, 6, 7, 8, 9}, {1, 2, 3, 4, 5, 6, 7, 8, 9},
  {1, 2, 3, 4, 5, 6, 7, 8, 9}, {9}, {1, 2, 3, 4, 5, 6, 7, 8, 9}}}
```

```
In[19]= filtre[G_] := Map[Function[z,
```

```
  Map[If[Length[#] > 1, Complement[#, Apply[Union, Cases[z, {_}]]], #] &, z]], G]
```

```
In[20]= filtre[G]
```

```
Out[20]= {{{{1, 2, 3, 5, 6, 9}, {1, 2, 3, 5, 6, 9}, {1, 2, 3, 5, 6, 9}, {4},
  {1, 2, 3, 5, 6, 9}, {1, 2, 3, 5, 6, 9}, {8}, {7}, {1, 2, 3, 5, 6, 9}},
  {{1, 3, 6, 8}, {4}, {7}, {1, 3, 6, 8}, {9}, {2}, {1, 3, 6, 8}, {5}, {1, 3, 6, 8}},
  {{2}, {1, 4, 5, 7, 8, 9}, {1, 4, 5, 7, 8, 9}, {6}, {1, 4, 5, 7, 8, 9},
  {1, 4, 5, 7, 8, 9}, {1, 4, 5, 7, 8, 9}, {3}, {1, 4, 5, 7, 8, 9}},
  {{9}, {7}, {1, 4, 6, 8}, {5}, {1, 4, 6, 8}, {1, 4, 6, 8}, {2}, {1, 4, 6, 8}, {3}},
  {{5}, {1, 3, 9}, {8}, {1, 3, 9}, {2}, {4}, {7}, {1, 3, 9}, {6}},
  {{6}, {1, 2, 3, 9}, {4}, {1, 2, 3, 9}, {1, 2, 3, 9}, {7}, {1, 2, 3, 9}, {8}, {5}},
  {{1, 2, 4, 5, 6}, {9}, {1, 2, 4, 5, 6}, {3},
  {1, 2, 4, 5, 6}, {8}, {1, 2, 4, 5, 6}, {1, 2, 4, 5, 6}, {7}},
  {{5, 7, 8, 9}, {5, 7, 8, 9}, {3}, {2}, {4}, {5, 7, 8, 9}, {1}, {6}, {5, 7, 8, 9}},
  {{3, 4, 5, 6, 7, 8}, {1}, {2}, {3, 4, 5, 6, 7, 8}, {3, 4, 5, 6, 7, 8},
  {3, 4, 5, 6, 7, 8}, {3, 4, 5, 6, 7, 8}, {9}, {3, 4, 5, 6, 7, 8}}}}
```

```
In[21]= H = Transpose[filtrer[Transpose[filtrer[initialiser[M]]]]]
```

```
Out[21]= {{{{1, 3}, {2, 3, 5, 6}, {1, 5, 6, 9}, {4}, {1, 3, 5, 6}, {1, 3, 5, 6, 9}, {8}, {7},
  {1, 2, 9}}, {{1, 3, 8}, {4}, {7}, {1, 8}, {9}, {2}, {3, 6}, {5}, {1, 8}},
  {{2}, {5, 8}, {1, 5, 9}, {6}, {1, 5, 7, 8}, {1, 5, 9}, {4, 5, 9}, {3}, {1, 4, 8, 9}},
  {{9}, {7}, {1, 6}, {5}, {1, 6, 8}, {1, 6}, {2}, {1, 4}, {3}},
  {{5}, {3}, {8}, {1, 9}, {2}, {4}, {7}, {1}, {6}},
  {{6}, {2, 3}, {4}, {1, 9}, {1, 3}, {7}, {3, 9}, {8}, {5}},
  {{1, 4}, {9}, {1, 5, 6}, {3}, {1, 5, 6}, {8}, {4, 5, 6}, {1, 2, 4}, {7}},
  {{7, 8}, {5, 8}, {3}, {2}, {4}, {5, 9}, {1}, {6}, {8, 9}},
  {{3, 4, 7, 8}, {1}, {2}, {7, 8}, {3, 5, 6, 7, 8}, {3, 5, 6}, {3, 4, 5, 6}, {9}, {4, 8}}}}
```

```
In[22]= carré[H_] := {{H[[1, 1]], H[[1, 2]], H[[1, 3]],
```

```
  H[[2, 1]], H[[2, 2]], H[[2, 3]], H[[3, 1]], H[[3, 2]], H[[3, 3]],
  {H[[1, 4]], H[[1, 5]], H[[1, 6]], H[[2, 4]], H[[2, 5]], H[[2, 6]],
  H[[3, 4]], H[[3, 5]], H[[3, 6]]}, {H[[1, 7]], H[[1, 8]], H[[1, 9]],
  H[[2, 7]], H[[2, 8]], H[[2, 9]], H[[3, 7]], H[[3, 8]], H[[3, 9]]},
  {H[[4, 1]], H[[4, 2]], H[[4, 3]], H[[5, 1]], H[[5, 2]],
  H[[5, 3]], H[[6, 1]], H[[6, 2]], H[[6, 3]]},
  {H[[4, 4]], H[[4, 5]], H[[4, 6]], H[[5, 4]], H[[5, 5]],
  H[[5, 6]], H[[6, 4]], H[[6, 5]], H[[6, 6]]},
  {H[[4, 7]], H[[4, 8]], H[[4, 9]], H[[5, 7]], H[[5, 8]],
  H[[5, 9]], H[[6, 7]], H[[6, 8]], H[[6, 9]]},
  {H[[7, 1]], H[[7, 2]], H[[7, 3]], H[[8, 1]], H[[8, 2]],
  H[[8, 3]], H[[9, 1]], H[[9, 2]], H[[9, 3]]},
  {H[[7, 4]], H[[7, 5]], H[[7, 6]], H[[8, 4]], H[[8, 5]],
  H[[8, 6]], H[[9, 4]], H[[9, 5]], H[[9, 6]]},
  {H[[7, 7]], H[[7, 8]], H[[7, 9]], H[[8, 7]], H[[8, 8]],
  H[[8, 9]], H[[9, 7]], H[[9, 8]], H[[9, 9]]}}
```

```
In[23]=
```

