

Práctica nº 4

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1 Create the simplest WHILE program that computes the diverge function (with zero arguments) and compute the codification of its code

The simplest WHILE program without any arguments that computes the diverge function is the next one

$Q = (0, s)$

```
X2 := X1 + 1;  
while X2 != 0 do  
    X1 := 0;  
od
```

The codification of the code s is:

- CODE2N ("X₂ :=X₁ + 1 ; while X₂ !=0 do X₁ :=0 od ")

2 Create an Octave script that enumerates all the vectors

We already know that we can establish a bijection between all the vectors and \mathbb{N} , so we only need a program with a loop that can print all the set of vectors. Because of that, we make the following code that prints the N first vectors:

```
function printNvectors(N)  
for i = 0: N - 1  
disp (['(' num2str(godeldecoding(i))')'])  
end  
end
```

3 Create an Octave script that enumerates all the WHILE programs

This case is very similar to activity 2 since there exists a bijection between \mathbb{N} and WHILE programs, so the Octave script this time is:

```
function printNWhilePrograms(N)
for i = 0: N - 1
disp (N2WHILE(i))
end
end
```