

PRACTICA 4

Pablo Pardo Fernández

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1 Activities

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

```
Q = (0, s)
s :
  X2:=X1 + 1;
  while X2 ≠ 0 do
    X1:=0
  od
```

And the codification of the code s is:

```
> CODE2N("X2:=X1+1; while X2!=0 do X1:=0 od")
ans = 10876
```

2. Create an Octave script that enumerates all the vectors.

It is known that it can be established 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. The following code 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 because there exists a bijection between WHILE programs and \mathbb{N} , so the Octave script is:

```
function printNwhilePrograms(N)

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

end
```