

Práctica 4

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2º A Ingeniería Informática

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Activities

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

Código función divergente:

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

Codificación del código:

$$\begin{aligned} \text{code2N}(X2 := X1 + 1; \text{while } X2 \neq 0 \text{ do } X1 := 0 \text{ od}) &= \\ = \Gamma(\text{sent2N}(X2 := X1 + 1), \text{sent2N}(\text{while } X2 \neq 0 \text{ do } X1 := 0)) &= \\ = \Gamma(7, 9) = \sigma_1^2(1, \sigma_1^2(7, 9)) = \sigma_1^2(1, 145) &= \frac{146 \times 147}{2} + 145 = 10876 \end{aligned}$$

Nota:

$$\text{sent2N}(X2 := X1 + 1) = 5 \times \sigma_1^2(1, 0) + 2 = 7$$
$$\begin{aligned} \text{sent2N}(\text{while } X2 \neq 0 \text{ do } X1 := 0) &= 5 \times \sigma_1^2(1, \text{code2N}(X1 := 0)) + 4 = \\ = 5 \times \sigma_1^2(1, 0) + 4 &= 9 \end{aligned}$$
$$\begin{aligned} \text{code2N}(X1 := 0) &= \Gamma(\text{sent2N}(X1 := 0)) - 1 = \sigma_1^2(0, \text{sent2N}(X1 := 0)) + 1 - 1 = \\ = \sigma_1^2(0, 0) &= 0 \end{aligned}$$

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

```
function printVectors()  
i=0;  
while (i>=0)  
    disp(['(' num2str(godeldecoding(i)) ')'])  
    i=i+1;  
endwhile  
end
```

Ejemplo de ejecución en Octave:

```

alumno@TALF: ~/talfuma/software/Whilelanguage/encoding
Archivo Editar Ver Buscar Terminal Ayuda

Read http://www.octave.org/bugs.html to learn how to submit bug reports.
For information about changes from previous versions, type 'news'.

octave:1> printVectors()
()
(0)
(0 0)
(1)
(0 0 0)
(1 0)
(2)
(0 0 0 0)
(1 0 0)
(0 1)
(3)
(0 0 0 0 0)
(1 0 0 0)
(0 0 1)
(2 0)
(4)
(0 0 0 0 0 0)
(1 0 0 0 0)
(0 0 0 1)
(0 1 0)
(1 1)
(5)
(0 0 0 0 0 0 0)
-- less -- (f)orward, (b)ack, (q)uit...skipping...

```

3. Create an Octave script that enumerates all the WHILE programs.

```

function printWhile()
i=0;
while (i>=0)
    disp(N2WHILE(i))
    i=i+1;
endwhile
end

```

Ejemplo de ejecución en Octave:

```

alumno@TALF: ~/talfuma/software/Whilelanguage/encoding
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octave:1> printWhile()
(0, X1:=0)
(1, X1:=0)
(0, X1:=0; X1:=0)
(2, X1:=0)
(1, X1:=0; X1:=0)
(0, X1:=X1)
(3, X1:=0)
(2, X1:=0; X1:=0)
(1, X1:=X1)
(0, X1:=0; X1:=0; X1:=0)
(4, X1:=0)
(3, X1:=0; X1:=0)
(2, X1:=X1)
(1, X1:=0; X1:=0; X1:=0)
(0, X1:=X1; X1:=0)
(5, X1:=0)
(4, X1:=0; X1:=0)
(3, X1:=X1)
(2, X1:=0; X1:=0; X1:=0)
(1, X1:=X1; X1:=0)
(0, X1:=X1+1)
(6, X1:=0)
(5, X1:=0; X1:=0)
(4, X1:=X1)
(3, X1:=0; X1:=0; X1:=0)
(2, X1:=X1; X1:=0)
(1, X1:=X1+1)
(0, X1:=0; X1:=0; X1:=0; X1:=0)
-- less -- (f)orward, (b)ack, (q)uit

```