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**Algorithm 1** Generator

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1: procedure GENERATOR
Input: dia
2:   for  $d := 1$  to days do
3:     if categoria  $\neq$  urgente then
4:       if domingo(dia) = verdadero then
5:          $dia \leftarrow dia + 1$ 
6:       end if
7:     end if
8:      $pat\_day \leftarrow random(0, total\_pat)$ 
9:     for  $p := 1$  to  $pat\_day$  do
10:       $r \leftarrow random(0, 1)$ 
11:       $prob \leftarrow 0$ 
12:      for  $i := 1$  to  $n\_cat$  do
13:         $prob \leftarrow prob + p_i$ 
14:        if  $r \leq prob$  then
15:           $type \leftarrow i$ 
16:           $release\_date \leftarrow d + 1$ 
17:           $due\_date \leftarrow release\_date + due\_i$ 
18:           $treatments \leftarrow sessions\_pat(treatments_i, ses_i, prob\_ses_i)$ 
19:           $interruption \leftarrow random(0, prob\_int_i * treatments)$ 
20:
21:           $machine \leftarrow set\_machine(n\_mach, prob\_machines_i)$ 
22:
23:          for  $w := 1$  to working\_days do
24:            do
25:              for  $s := 1$  to shifts do
26:                 $x_{ws} \leftarrow random(0 \text{ or } 1)$ 
27:              end for
28:              while  $sum(x_{ws}) \geq 1$ 
29:                end for
30:              end if
31:            end for
32:
33:             $new\_patient \leftarrow type, release\_date, due\_date, treatments, interruption, machine, first\_time, time\_session$ 
34:
35:             $x_{ws}$ 
36:             $list\_patients_d \leftarrow new\_patient$ 
37:             $order\_patients\_category(list\_patients_d)$ 
38:          end for
39:          return days, n\_mach, list\_patients, time
40:        end for
41:      end procedure
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