Algorithm 1: EquCg

Input: Observation data sequence D_n, coarse-graining granularity Cg

Output: Converted symbol sequence D_n^*

obtain the length of D_n L_{D_n};
$nd \leftarrow round(L_{D_n}/Cg), nad \leftarrow (L_{D_n} - 1), nse \leftarrow (Cg - 1)$;
get a copy of D_n D_n^*;
get another copy of D_n and sort this copy from the smallest to the biggest, then get an ordered data sequence oCD_n;
$minT \leftarrow np.arrange(Cg), maxT \leftarrow np.arrange(Cg)$;
for *i=0 to nse* **do**
    if $i < nseand(nd \times (i+1)) < nad$ **then**
        if $i = 0$ **then**
            $D_{max} \leftarrow \max(oCD_n[nd \times i], oCD_n[nd \times (i+1) - 1])$;
        else
            $D_{max} \leftarrow \max(oCD_n[nd \times (i-1)], oCD_n[nd \times i], oCD_n[nd \times (i+1) - 1])$;
        end
        if $oCD_n[nd \times (i+1) - 1]) \leq D_{max}$ **then**
            $oCD_n[nd \times (i+1) - 1] \leftarrow (D_{max} + 10^{-8})$;
        end
        $minT[i] \leftarrow oCD_n[nd \times i]$;
        $maxT[i] \leftarrow oCD_n[nd \times (i+1)]$;
    end
    if $(nd \times i) \geq nad$ **then**
        $minT[i] \leftarrow oCD_n[nad] + 1$;
        $maxT[i] \leftarrow oCD_n[nad] + 2$;
    end
    for $j = 0$ *to* nad **do**
        if $D_n[j] \geq minT[i]$ **then**
            if $j < nad$ **then**
                if $D_n[j]¡maxT[i]$ **then**
                    $D_n^*[j] \leftarrow i$;
                end
            else
                if $D_n[j] \leq maxT[i]$ **then**
                    $D_n^*[j] \leftarrow i$;
                end
            end
        end
    end
end

Algorithm 2: CGDR

Input: Observation data sequence D_X and D_Y

Output: Converted symbol sequence D_X^* and D_Y^*, coarse-graining granularity α

obtain the length of D_X L_{D_X} ;
if $(L_{D_X})/10 < 10$ **then**
  $bcg \leftarrow 6$
else
  $bcg \leftarrow 10$;
end
for $Cg = bcgtoint((L_{D_X})/11$ **do**
  $TS_{E_x} \leftarrow EquCg(D_X, Cg), TS_{E_y} \leftarrow EquCg(D_Y, Cg) \leftarrow EquCg(D_Y, Cg)$;
  $nse \leftarrow (Cg - 1), nad \leftarrow (L_{D_X} - 1), Sm \leftarrow 0, \alpha \leftarrow 0$;
  for $i = 0$ *to* nse **do**
    $N_{E_x} \leftarrow 0, N_{E_y} \leftarrow 0, Sc \leftarrow 0$ **if** $i > 0$ **then**
      $a \leftarrow i$;
    else
      $a \leftarrow (i + 1)$;
    end
    for $j = 0$ *to* nad **do**
      if $TS_{E_x}[j] = a$ **then**
        $N_{E_x} += a$;
      end
      if $TS_{E[j]=a}$ **then**
        $N_{E_y} += a$;
      end
      $Si \leftarrow abs((N_{E_x} - N_{E_y})/a)$;
    end
    $Sc += Si$;
  end
  if $Sc > Sm$ **then**
    $Sm \leftarrow Sc, \alpha \leftarrow Cg, D_X^* \leftarrow TS_{E_x}, D_Y^* \leftarrow TS_{E_y}$;
  else
    if $Sc = Sm$ **then**
      if $abs(10 - Cg) < abs(10 - \alpha$ **then**
        $Sm \leftarrow Sc, \alpha \leftarrow Cg, D_X^* \leftarrow TS_{E_x}, D_Y^* \leftarrow TS_{E_y}$;
      end
    end
  end
end