算法 1: 基于贪心对平行于扫海区域的长边的情况进行离散化求解

Input: θ, α, D_{mid}

θ表示多波束换能器的开角

α表示坡度

D_{mid}表示海域中心点处的海水深度

Output: ans, x, y

ans离散后的最短测量长度

矩阵x, y分别表示离散后测线点的x, y坐标

begin

  // 算海域最深的深度

  $\lambda = \arctan(-\tan\alpha\cos\beta)$

  $D_{north} = D_{mid} - (-2/2 * 1852)\tan\alpha$

  l = -1852*2 : 2*1852;

  for $i \leftarrow 1$ **to** $4 * 1852$ **do**

    $D_i = D_{mid} - l_i \tan\lambda$

    $WR_i = \frac{D_i}{\sin(\frac{\pi}{2}+\lambda-\frac{\theta}{2})}\sin\frac{\theta}{2}$

    $WL_i = \frac{D_i}{\sin(\frac{\pi}{2}-\lambda-\frac{\theta}{2})}\sin\frac{\theta}{2}$

    $W_i = WL_i + WR_i$

    $d_i = 0.9W_i$

    $push(D_i, WR_i, WL_i, W_i, d_i) \rightarrow (D, WR, WL, W, d)$

  end

  sum = 0;

  init(x , y);

  for $i \leftarrow 1$ **to** $4 * 1852$ **do**

    $y' = WL_i$;

    $push(d_i, y') \rightarrow (x, y)$

    while *1* **do**

      if $y' + WR_i \geq 2 * 1852$ **then**

        break;

      end

      y' = y' + d(i);

      $push(d_i, y') \rightarrow (x, y)$

      ans = ans + 1;

    end

  end

  return *ans,x,y*

end