

Entity	Categorization	Conditions
End of $S_{\pi(j-1),i}$	collinear (1)	$q_{j-1} = p_{i-1}$ $q_{j+1} = p_{i+1}$
	left (2)	$q_{j-1} \in I$ $(q_{j-1} \in III) \wedge (p_{i-2} \in II)$ $(q_{j-1} \in IV) \wedge (p_{i+2} \in II)$
	right (3)	$q_{j-1} \in II$ $(q_{j-1} \in III) \wedge (p_{i-2} \in I)$ $(q_{j-1} \in IV) \wedge (p_{i+2} \in I)$
Beginning of $S_{i,\pi(j+1)}$	collinear (1)	$q_{j-1} = p_{i-1}$ $q_{j+1} = p_{i+1}$
	left (2)	$q_{j+1} \in I$ $(q_{j+1} \in III) \wedge (p_{i-2} \in II)$ $(q_{j+1} \in IV) \wedge (p_{i+2} \in II)$
	right (3)	$q_{j+1} \in II$ $(q_{j+1} \in III) \wedge (p_{i-2} \in I)$ $(q_{j+1} \in IV) \wedge (p_{i+2} \in I)$