$$\text{If } D_{A(n)} \cap D_{B(n)} \quad = \quad \emptyset :$$

$$D_n \quad = \quad D_{A(n)} \cup D_{B(n)}$$

$$S_n \quad = \quad 1 + S_{A(n)} + S_{B(n)}$$

$$\text{otherwise} :$$

$$D_n \quad = \quad D_{A(n)} \cap D_{B(n)}$$

$$S_n \quad = \quad S_{A(n)} + S_{B(n)}$$