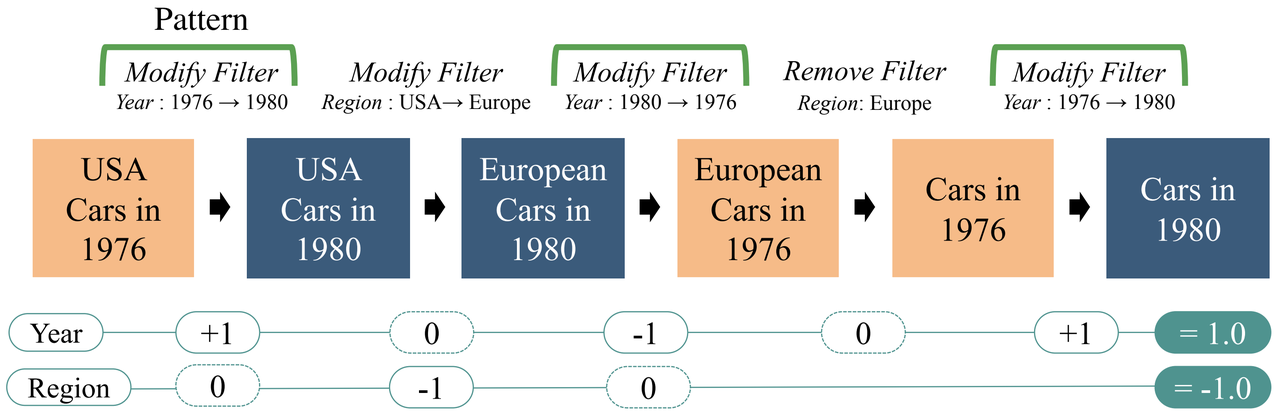
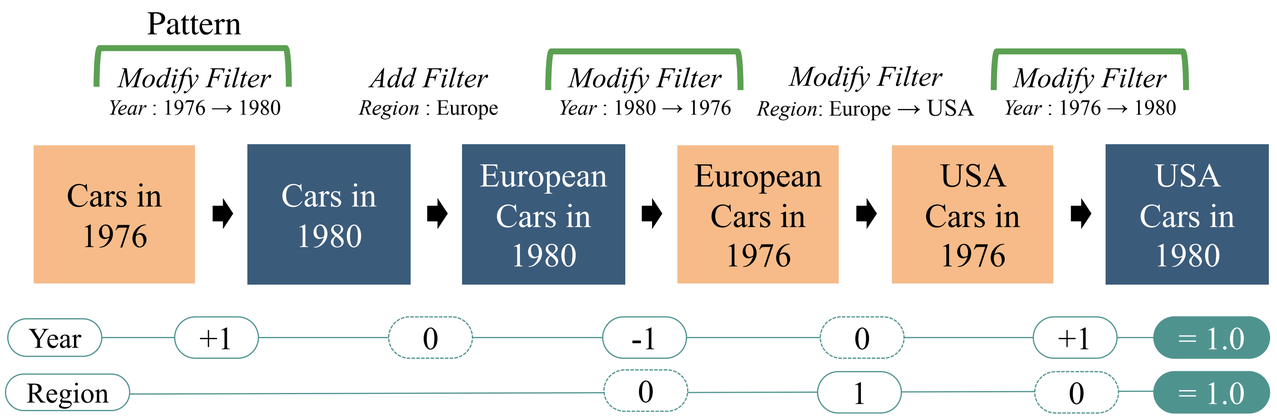
	$\sum_{i=2}^{\lvert S\rvert} T(S_{i-1}, S_i)$	$T(S_0, S_1)$	$F(S)$	$W(S)$
(a)	233 = 46 (= *Modify Filter*$_{Year}$) + 46 (= *Modify Filter*$_{Region}$) + 46 (= *Modify Filter*$_{Year}$) + 49 (= *Remove Filter*$_{Region}$) + 46 (= *Modify Filter*$_{Year}$)	298 = 100 (=*Add Field*$_x$) + 100 (=*Add Field*$_y$) + 49 (= *Add Filter*$_{Year}$) + 49 (= *Add Filter*$_{Region}$)	0.747 $=1-\frac{\frac{\lvert-1+0.1\rvert}{3+0.1}+\frac{\lvert1+0.1\rvert}{5+0.1}}{2}$	0.5 $=1-\frac{3}{6}$ [*Modify Filter*$_{Year}$] occurs 3 times
(b)	233 = 46 (=*Modify Filter*$_{Year}$) + 49 (= *Add Filter*$_{Region}$) + 46 (= *Modify Filter*$_{Year}$) + 46 (= *Modify Filter*$_{Region}$) + 46 (= *Modify Filter*$_{Year}$)	249 = 100 (=*Add Field*$_x$) + 100 (=*Add Field*$_y$) + 49 (= *Add Filter*$_{Year}$)	0.715 $=1-\frac{\frac{\lvert1+0.1\rvert}{3+0.1}+\frac{\lvert1+0.1\rvert}{5+0.1}}{2}$	0.5 $=1-\frac{3}{6}$ [*Modify Filter*$_{Year}$] occurs 3 times
(c)	285 = 49 (= *Add Filter*$_{Region}$) + 46 (= *Modify Filter*$_{Region}$) + 95 (= *Remove Filter*$_{Region}$ + *Modify Filter*$_{Year}$) + 49 (= *Add Filter*$_{Region}$) + 46 (= *Modify Filter*$_{Region}$)	249 = 100 (=*Add Field*$_x$) + 100 (=*Add Field*$_y$) + 49 (= *Add Filter*$_{Year}$)	0.715 $=1-\frac{\frac{\lvert1+0.1\rvert}{3+0.1}+\frac{\lvert1+0.1\rvert}{5+0.1}}{2}$	0.333 $=1-\frac{4}{6}$ [*Add Filter*$_{Region}$, *Modify Filter*$_{Region}$] occurs 2 times

(a)



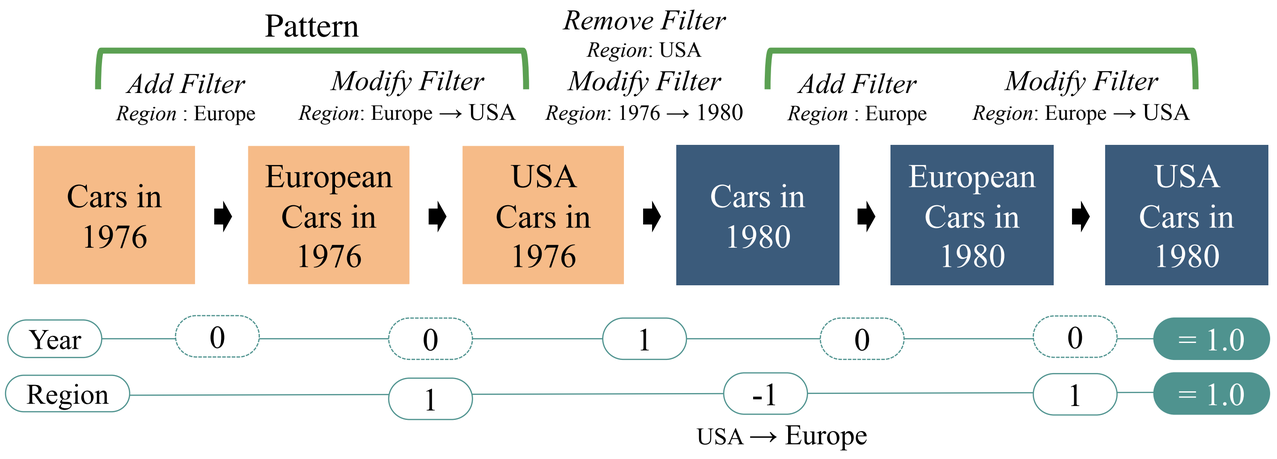
Final Cost : 265.873

(b)



Final Cost : 241.358

(c)



Final Cost : 178.060

All charts are scatter plots with filtered data points. For simplicity, we set transition costs of *Modify Filter*, *Add/Remove Filter*, and *Add Field on x/y* as 46, 49, and 100 respectively.