

Implementation (Insertion Sort)

$\begin{matrix} 0 & 1 & 2 & 3 & 4 \\ 9, & 5, & 1, & 4, & 3 \end{matrix}$
 $i = 1 \text{ to } 4$
 $\uparrow \uparrow \uparrow \uparrow \uparrow$
 $\underline{i = 1}$
 $\underline{\text{key} = 5}$
 $J \quad i$

$J = 0$ **True**
 $5 < 9$

$\begin{matrix} 0 & 1 \\ 5 & \boxed{9} \end{matrix}$

True
while $J \geq 0$ and $\text{key} < \text{arr}[J]$
 $\text{arr}[J+1] = \text{arr}[J]$

$\underline{J = -1} \Leftarrow J = J - 1$

$\text{arr}[J+1] = \text{key}$

$\begin{matrix} 0 & 1 & 2 \\ \boxed{1} & \boxed{5} & \boxed{9} \end{matrix}$

$i = 2$
 $\text{key} = 1$ $1 < 5$ **True**
 $J = 1 - 1$ $1 < 9$

True
 $J \geq 0$ and $\text{key} < \text{arr}[J]$

$\begin{matrix} 0 & 1 & 2 \\ \boxed{1} & \boxed{5} & \boxed{9} \end{matrix}$

while

$\text{arr}[J+1] = \text{arr}[J]$

$J = J - 1$

$\text{arr}[J+1] = \text{key}$