

## Exo5

```
In [ ]: def echange(liste,i,j):
        liste[i],liste[j] = liste[j],liste[i]
```

```
In [ ]: def min_liste(liste,ind):
        elt_min = liste[ind]
        ind_min=ind
        for k in range(ind,len(liste)):
            if liste[k]<elt_min:
                elt_min=liste[k]
                ind_min=k
        return ind_min
```

```
In [ ]: def tri_selection(liste):
        longueur = len(liste)
        for ind in range(longueur):
            ind_min = min_liste(liste,ind)
            echange(liste,ind,ind_min)
```

```
In [ ]: L=[12,19,10,13,11,15,9,14]
```

```
In [ ]:
```

```
In [ ]: def echange(liste,i,j):
        liste[i],liste[j] = liste[j],liste[i]
```

```
In [ ]: def max_liste(liste,ind):
        elt_max = liste[ind]
        ind_max=ind
        for k in range(ind,len(liste)):
            if liste[k]>elt_max:
                elt_max=liste[k]
                ind_max=k
        return ind_max
```

```
In [ ]: def tri_selection_inverse(liste):
        longueur = len(liste)
        for ind in range(longueur):
            ind_max = max_liste(liste,ind)
            echange(liste,ind,ind_max)
```

```
In [ ]: L=[12,19,10,13,11,15,9,14]
```

```
In [ ]: def tri_insertion_inverse(liste):  
        for ind in range(0, len(liste)-1):  
            j = ind  
            while liste[j+1]>liste[j] and j>=0:  
                echage(liste, j+1, j)  
                j=j-1
```

```
In [ ]: tri_insertion_inverse(L)  
print(L)
```