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UNIVERSITAS TANJUNGPURA PONTIANAK
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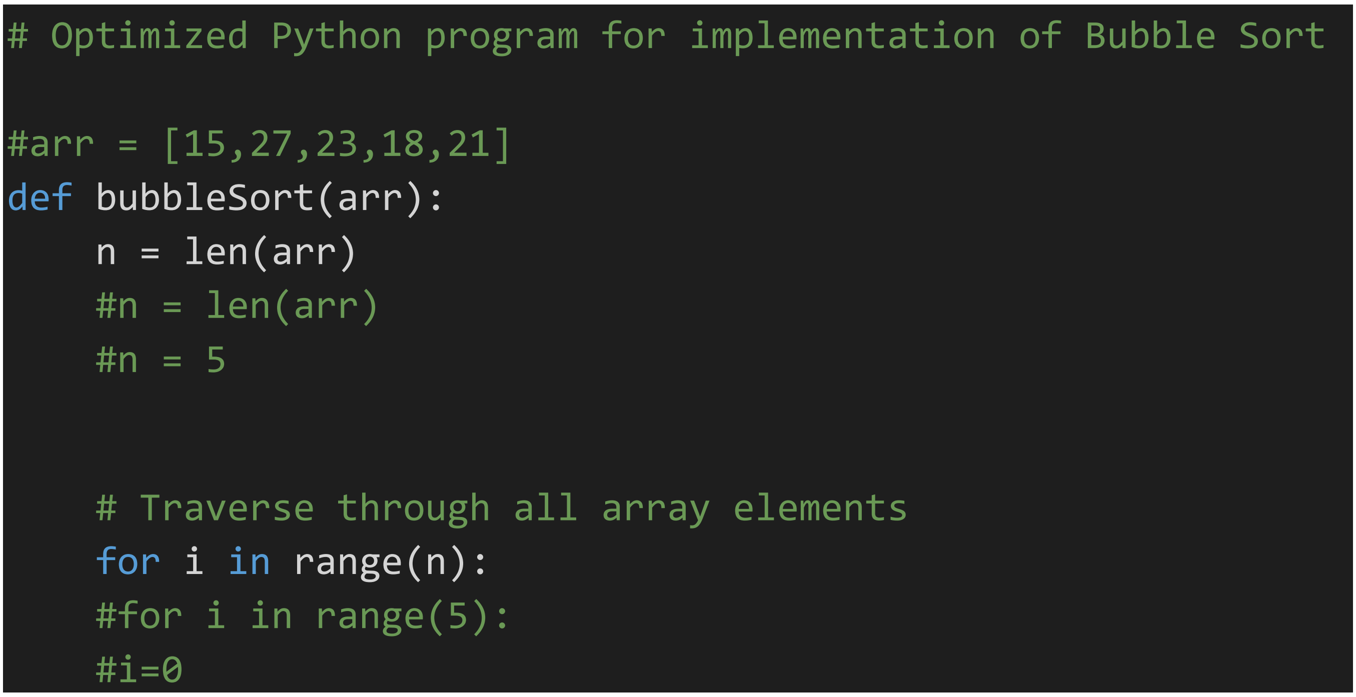
Nilai		**Paraf Asisten Praktikum**	

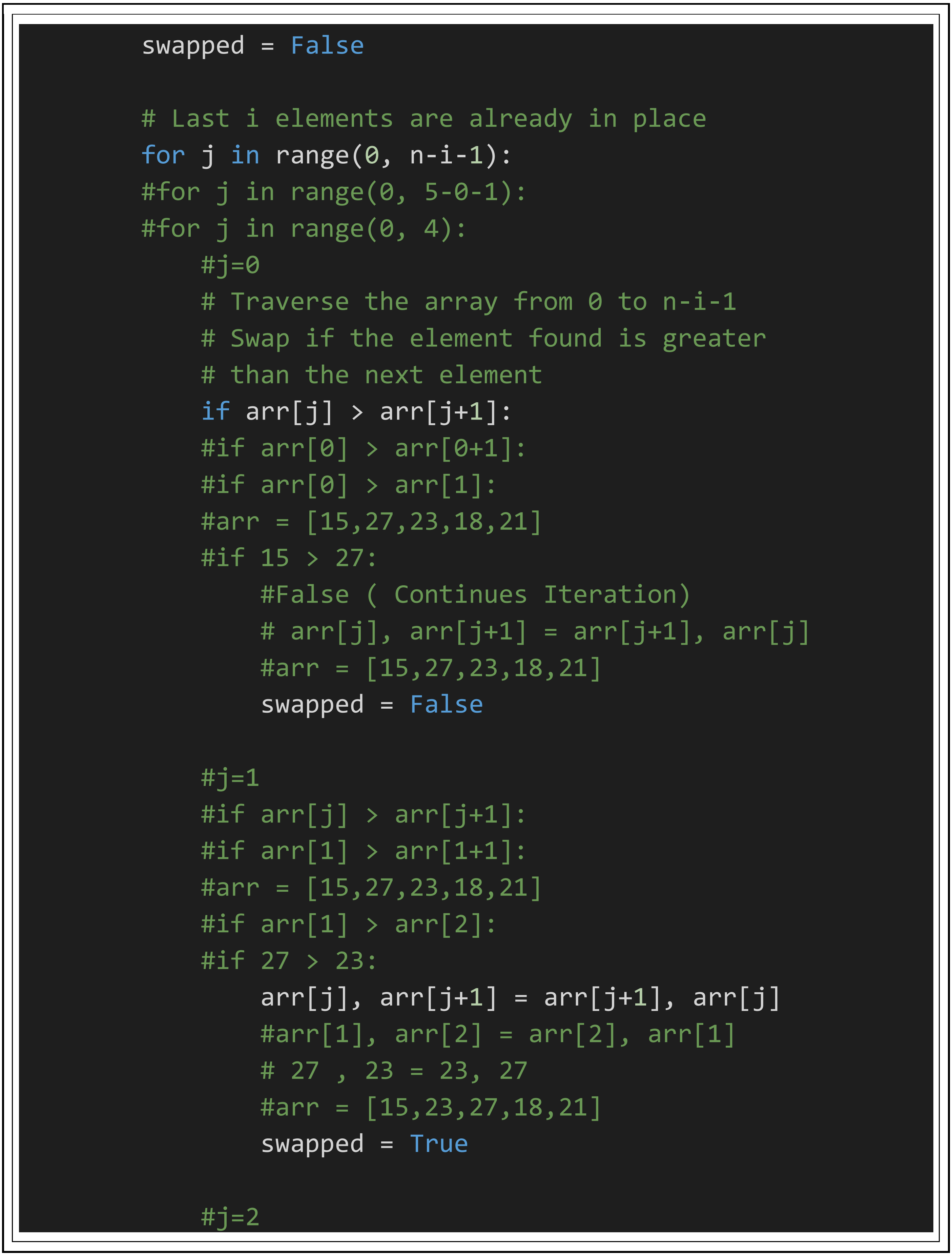
LEMBAR KERJA PRAKTIKUM

MATERI PRAKTIKUM : BubbleSort dan Selection Sort

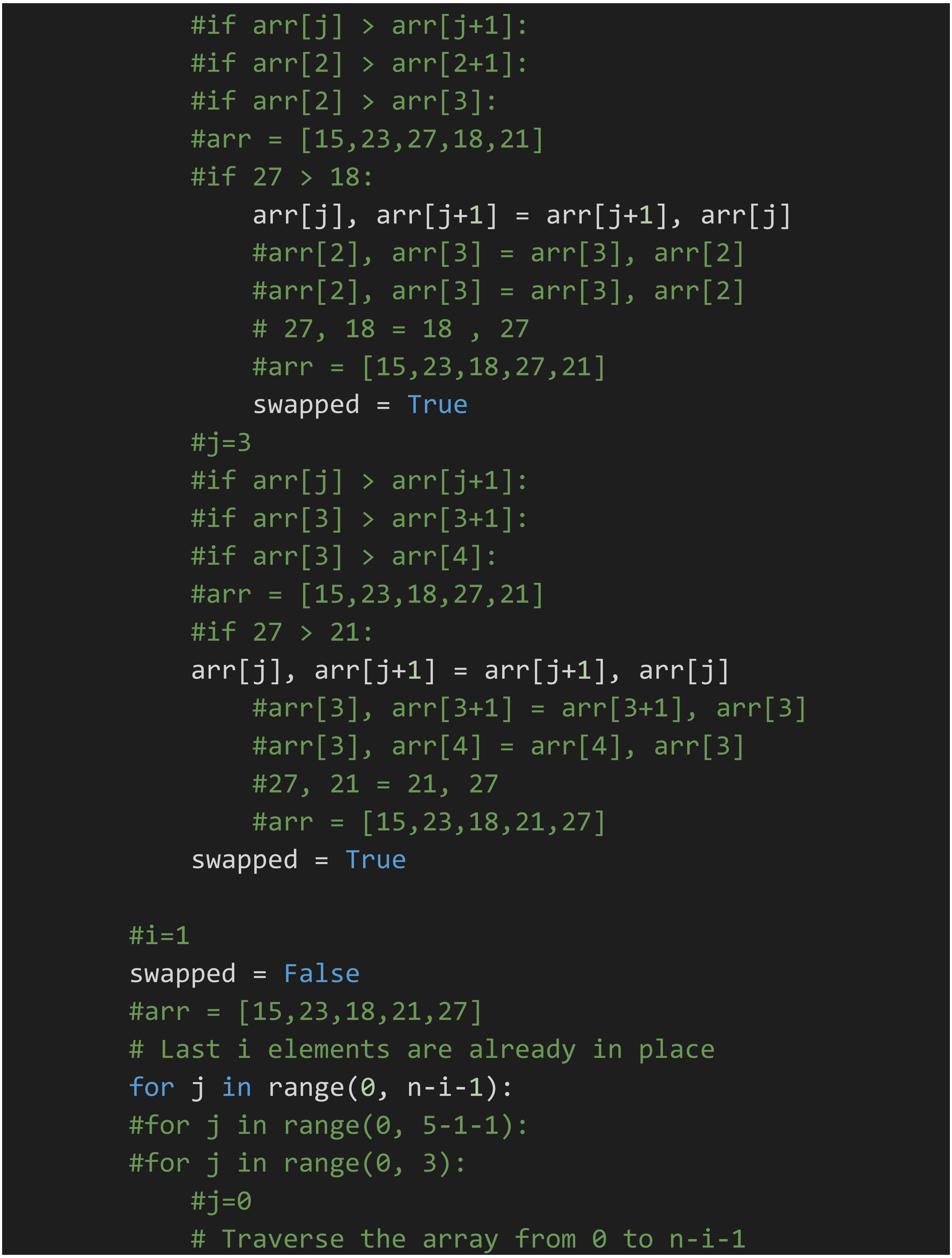
Percobaan 1. Uji Coba BubbleSort



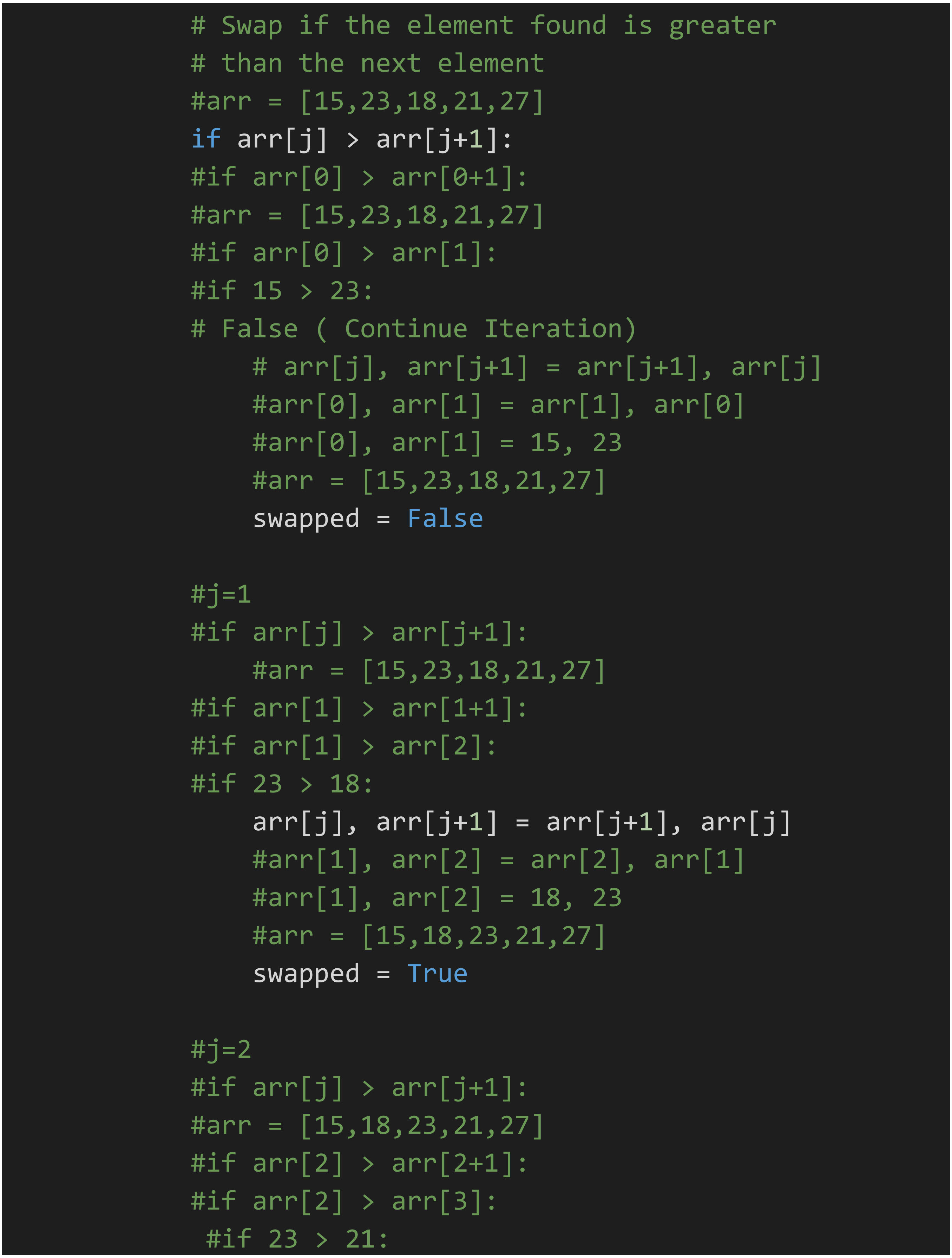
```
# Optimized Python program for implementation of Bubble Sort

#arr = [15,27,23,18,21]
def bubbleSort(arr):
    n = len(arr)
    #n = len(arr)
    #n = 5


    # Traverse through all array elements
    for i in range(n):
    #for i in range(5):
    #i=0
```



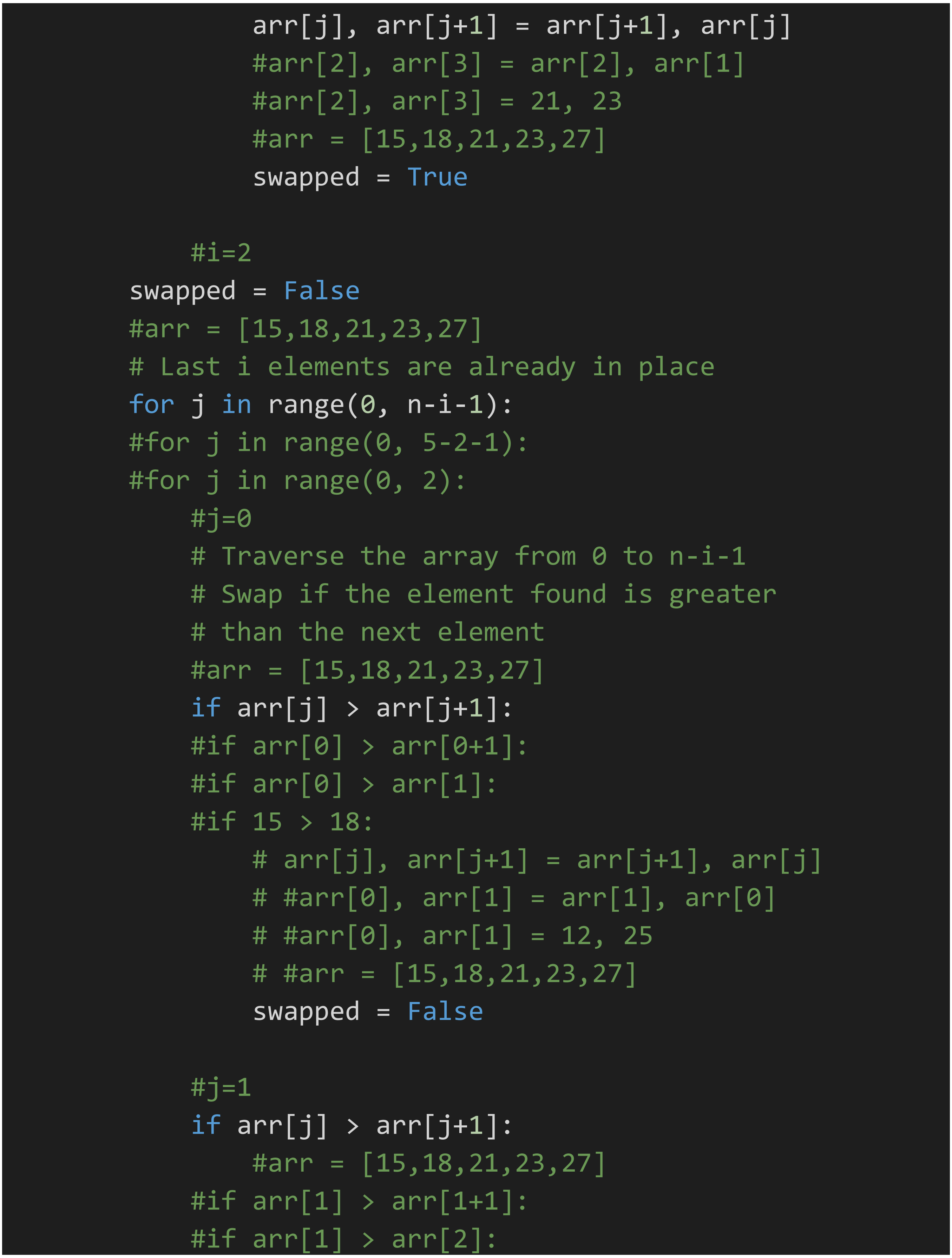
```
        swapped = False

        # Last i elements are already in place
        for j in range(0, n-i-1):
        #for j in range(0, 5-0-1):
        #for j in range(0, 4):
            #j=0
            # Traverse the array from 0 to n-i-1
            # Swap if the element found is greater
            # than the next element
            if arr[j] > arr[j+1]:
            #if arr[0] > arr[0+1]:
            #if arr[0] > arr[1]:
            #arr = [15,27,23,18,21]
            #if 15 > 27:
                #False ( Continues Iteration)
                # arr[j], arr[j+1] = arr[j+1], arr[j]
                #arr = [15,27,23,18,21]
                swapped = False

            #j=1
            #if arr[j] > arr[j+1]:
            #if arr[1] > arr[1+1]:
            #arr = [15,27,23,18,21]
            #if arr[1] > arr[2]:
            #if 27 > 23:
                arr[j], arr[j+1] = arr[j+1], arr[j]
                #arr[1], arr[2] = arr[2], arr[1]
                # 27 , 23 = 23, 27
                #arr = [15,23,27,18,21]
                swapped = True

            #j=2
```



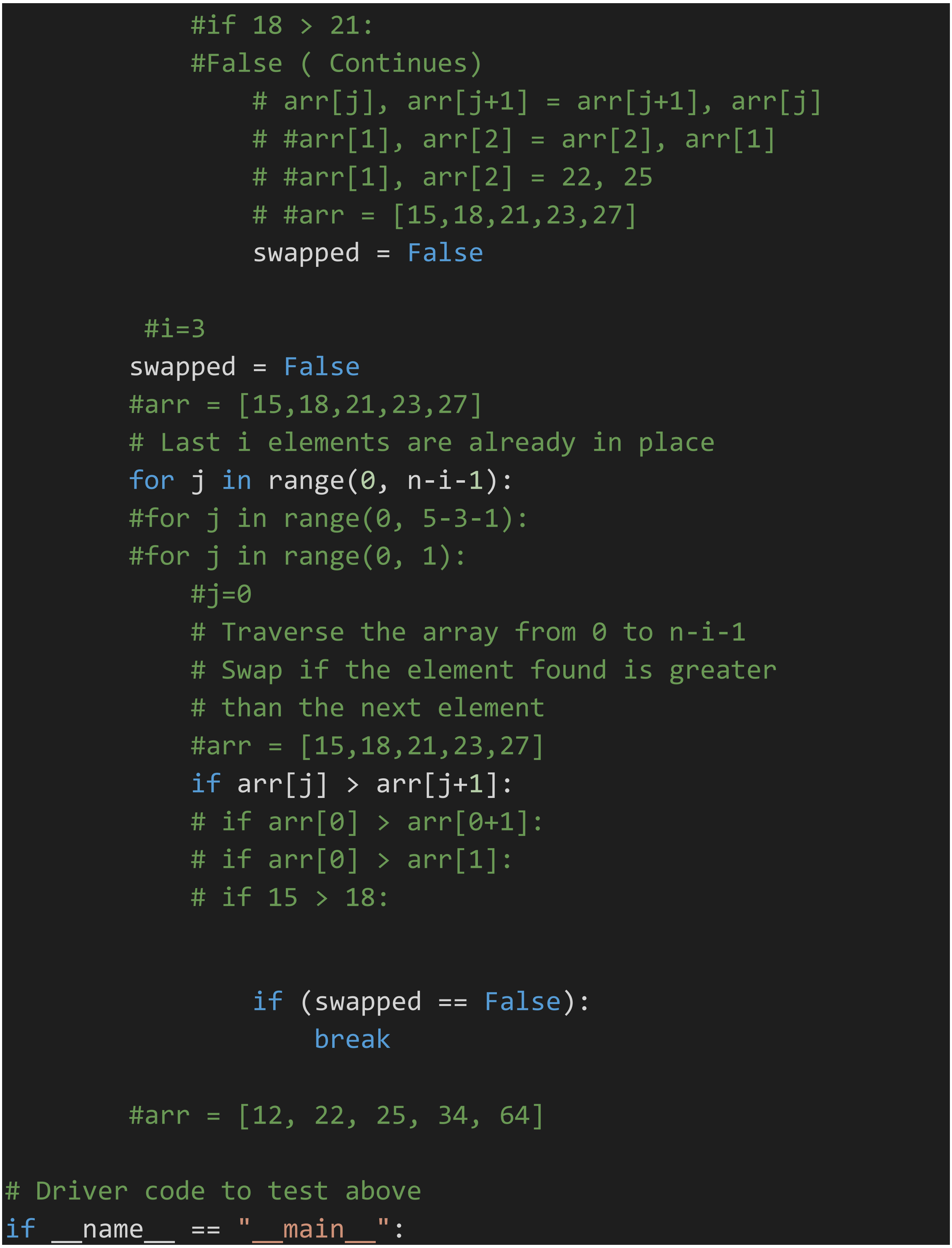
```
            #if arr[j] > arr[j+1]:
            #if arr[2] > arr[2+1]:
            #if arr[2] > arr[3]:
            #arr = [15,23,27,18,21]
            #if 27 > 18:
                arr[j], arr[j+1] = arr[j+1], arr[j]
                #arr[2], arr[3] = arr[3], arr[2]
                #arr[2], arr[3] = arr[3], arr[2]
                # 27, 18 = 18 , 27
                #arr = [15,23,18,27,21]
                swapped = True
            #j=3
            #if arr[j] > arr[j+1]:
            #if arr[3] > arr[3+1]:
            #if arr[3] > arr[4]:
            #arr = [15,23,18,27,21]
            #if 27 > 21:
            arr[j], arr[j+1] = arr[j+1], arr[j]
                #arr[3], arr[3+1] = arr[3+1], arr[3]
                #arr[3], arr[4] = arr[4], arr[3]
                #27, 21 = 21, 27
                #arr = [15,23,18,21,27]
            swapped = True

        #i=1
        swapped = False
        #arr = [15,23,18,21,27]
        # Last i elements are already in place
        for j in range(0, n-i-1):
        #for j in range(0, 5-1-1):
        #for j in range(0, 3):
            #j=0
            # Traverse the array from 0 to n-i-1
```



```
            # Swap if the element found is greater
            # than the next element
            #arr = [15,23,18,21,27]
            if arr[j] > arr[j+1]:
            #if arr[0] > arr[0+1]:
            #arr = [15,23,18,21,27]
            #if arr[0] > arr[1]:
            #if 15 > 23:
            # False ( Continue Iteration)
                # arr[j], arr[j+1] = arr[j+1], arr[j]
                #arr[0], arr[1] = arr[1], arr[0]
                #arr[0], arr[1] = 15, 23
                #arr = [15,23,18,21,27]
                swapped = False

            #j=1
            #if arr[j] > arr[j+1]:
                #arr = [15,23,18,21,27]
            #if arr[1] > arr[1+1]:
            #if arr[1] > arr[2]:
            #if 23 > 18:
                arr[j], arr[j+1] = arr[j+1], arr[j]
                #arr[1], arr[2] = arr[2], arr[1]
                #arr[1], arr[2] = 18, 23
                #arr = [15,18,23,21,27]
                swapped = True

            #j=2
            #if arr[j] > arr[j+1]:
            #arr = [15,18,23,21,27]
            #if arr[2] > arr[2+1]:
            #if arr[2] > arr[3]:
             #if 23 > 21:
```



```
                arr[j], arr[j+1] = arr[j+1], arr[j]
                #arr[2], arr[3] = arr[2], arr[1]
                #arr[2], arr[3] = 21, 23
                #arr = [15,18,21,23,27]
                swapped = True

            #i=2
        swapped = False
        #arr = [15,18,21,23,27]
        # Last i elements are already in place
        for j in range(0, n-i-1):
        #for j in range(0, 5-2-1):
        #for j in range(0, 2):
            #j=0
            # Traverse the array from 0 to n-i-1
            # Swap if the element found is greater
            # than the next element
            #arr = [15,18,21,23,27]
            if arr[j] > arr[j+1]:
            #if arr[0] > arr[0+1]:
            #if arr[0] > arr[1]:
            #if 15 > 18:
                # arr[j], arr[j+1] = arr[j+1], arr[j]
                # #arr[0], arr[1] = arr[1], arr[0]
                # #arr[0], arr[1] = 12, 25
                # #arr = [15,18,21,23,27]
                swapped = False

            #j=1
            if arr[j] > arr[j+1]:
                #arr = [15,18,21,23,27]
            #if arr[1] > arr[1+1]:
            #if arr[1] > arr[2]:
```



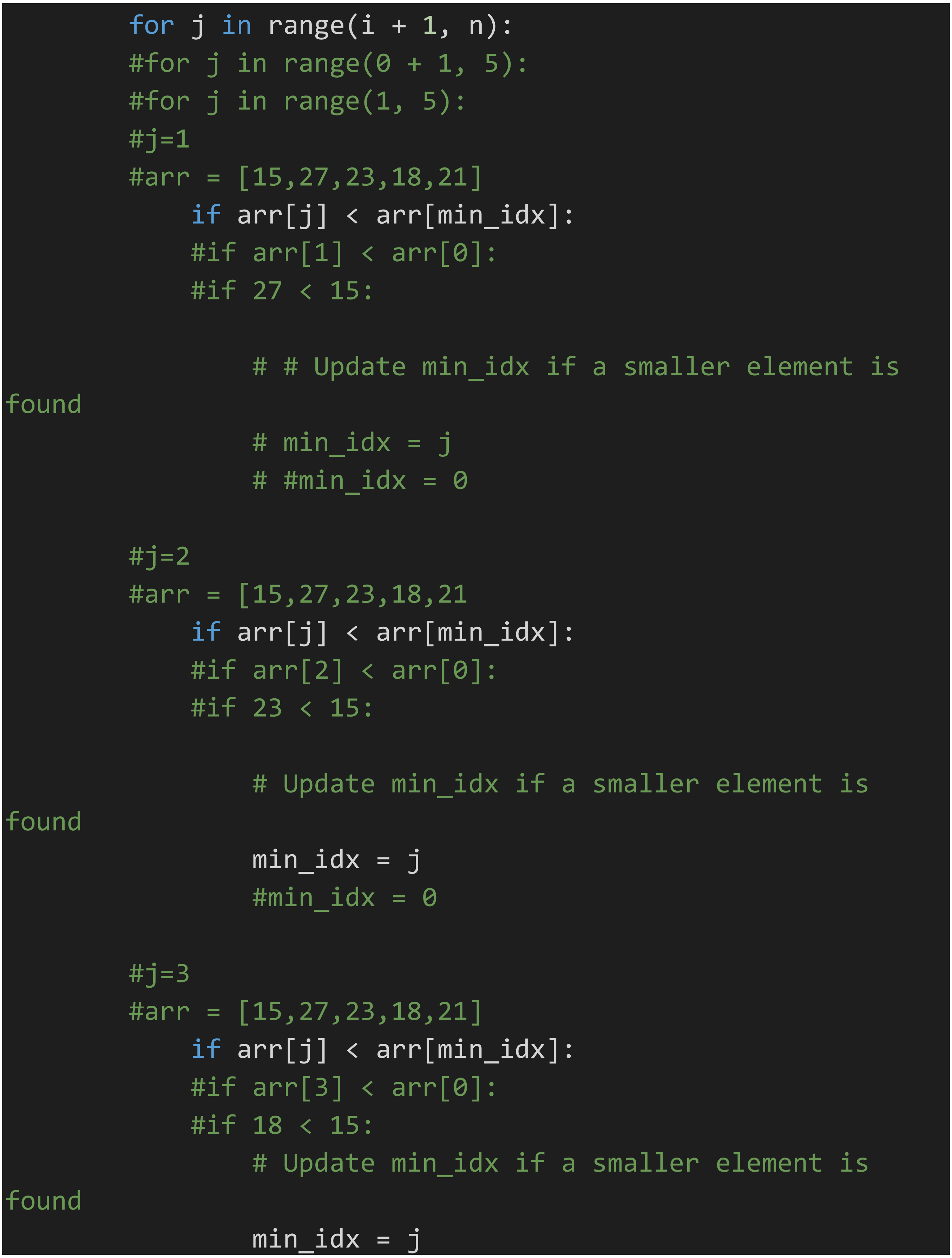
```
            #if 18 > 21:
            #False ( Continues)
                # arr[j], arr[j+1] = arr[j+1], arr[j]
                # #arr[1], arr[2] = arr[2], arr[1]
                # #arr[1], arr[2] = 22, 25
                # #arr = [15,18,21,23,27]
                swapped = False

         #i=3
        swapped = False
        #arr = [15,18,21,23,27]
        # Last i elements are already in place
        for j in range(0, n-i-1):
        #for j in range(0, 5-3-1):
        #for j in range(0, 1):
            #j=0
            # Traverse the array from 0 to n-i-1
            # Swap if the element found is greater
            # than the next element
            #arr = [15,18,21,23,27]
            if arr[j] > arr[j+1]:
            # if arr[0] > arr[0+1]:
            # if arr[0] > arr[1]:
            # if 15 > 18:


                if (swapped == False):
                    break

        #arr = [12, 22, 25, 34, 64]

# Driver code to test above
if __name__ == "__main__":
    arr = [15,27,23,18,21]

    bubbleSort(arr)

    print("Sorted array:")
    for i in range(len(arr)):
        print("%d" % arr[i], end=" ")
```

Output Program

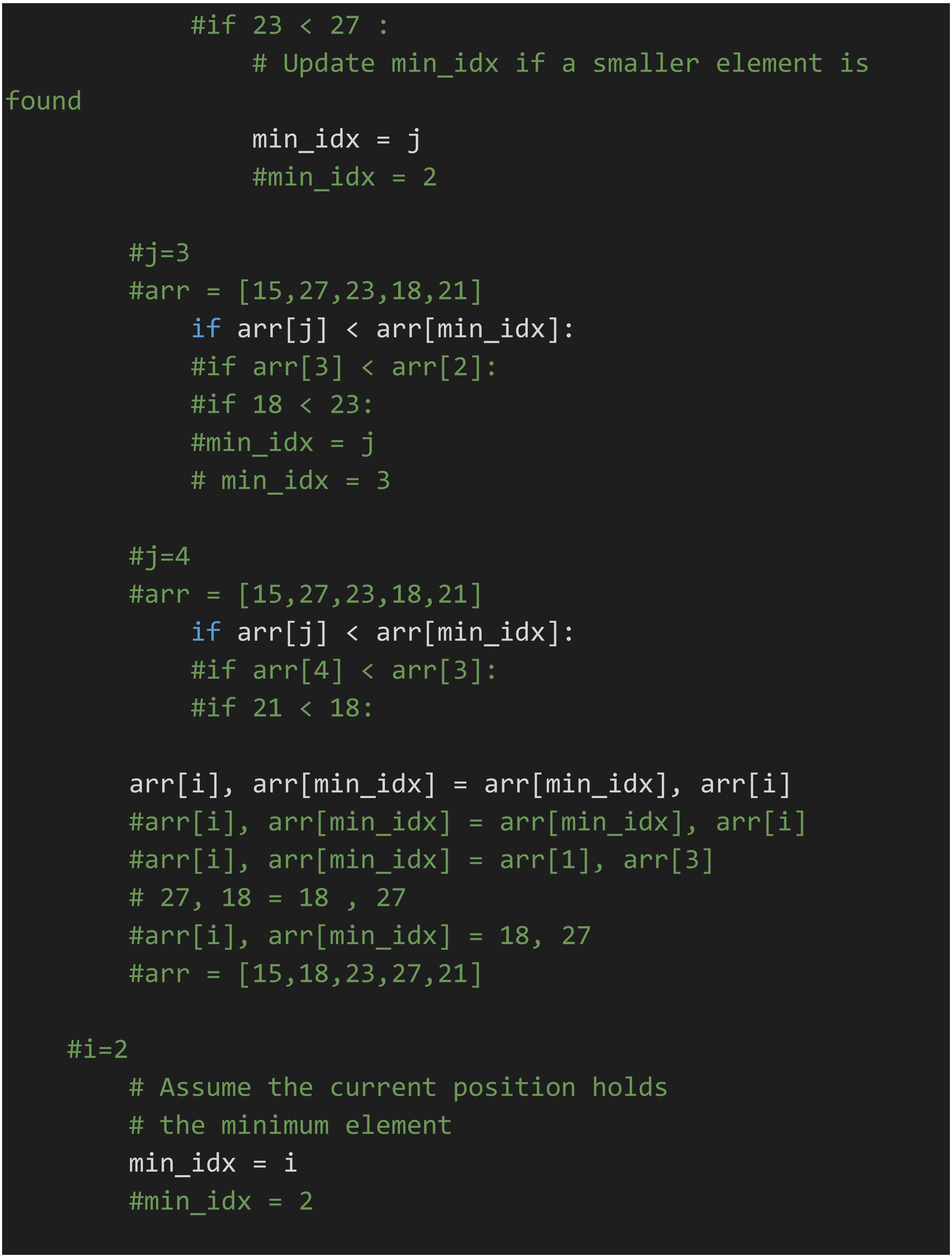
Berikan penjelasan singkat tentang apa yang Anda lakukan, hasil yang Anda peroleh, dan apa yang dapat dipelajari dari percobaan tersebut.

Percobaan 2. Uji Coba SelectionSort

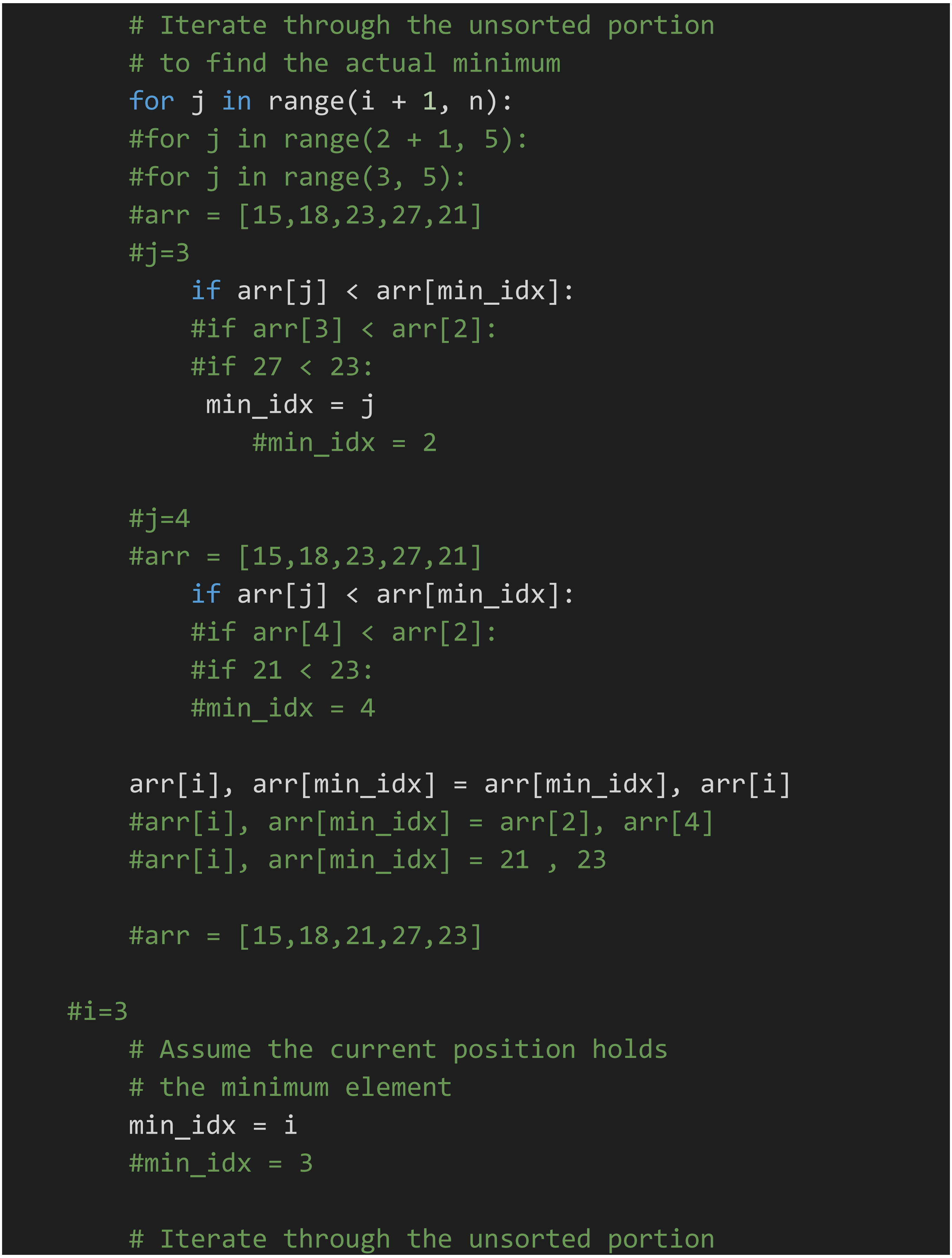
```
# Python program for implementation of Selection
# Sort
#arr = [15,27,23,18,21]
def selection_sort(arr):
    n = len(arr)
    #n=5
    for i in range(n - 1):
    #for i in range(5 - 1):
    #for i in range(4):
        #i=0
        # Assume the current position holds
        # the minimum element
        min_idx = i
        #min_idx = 0

        # Iterate through the unsorted portion
        # to find the actual minimum
```



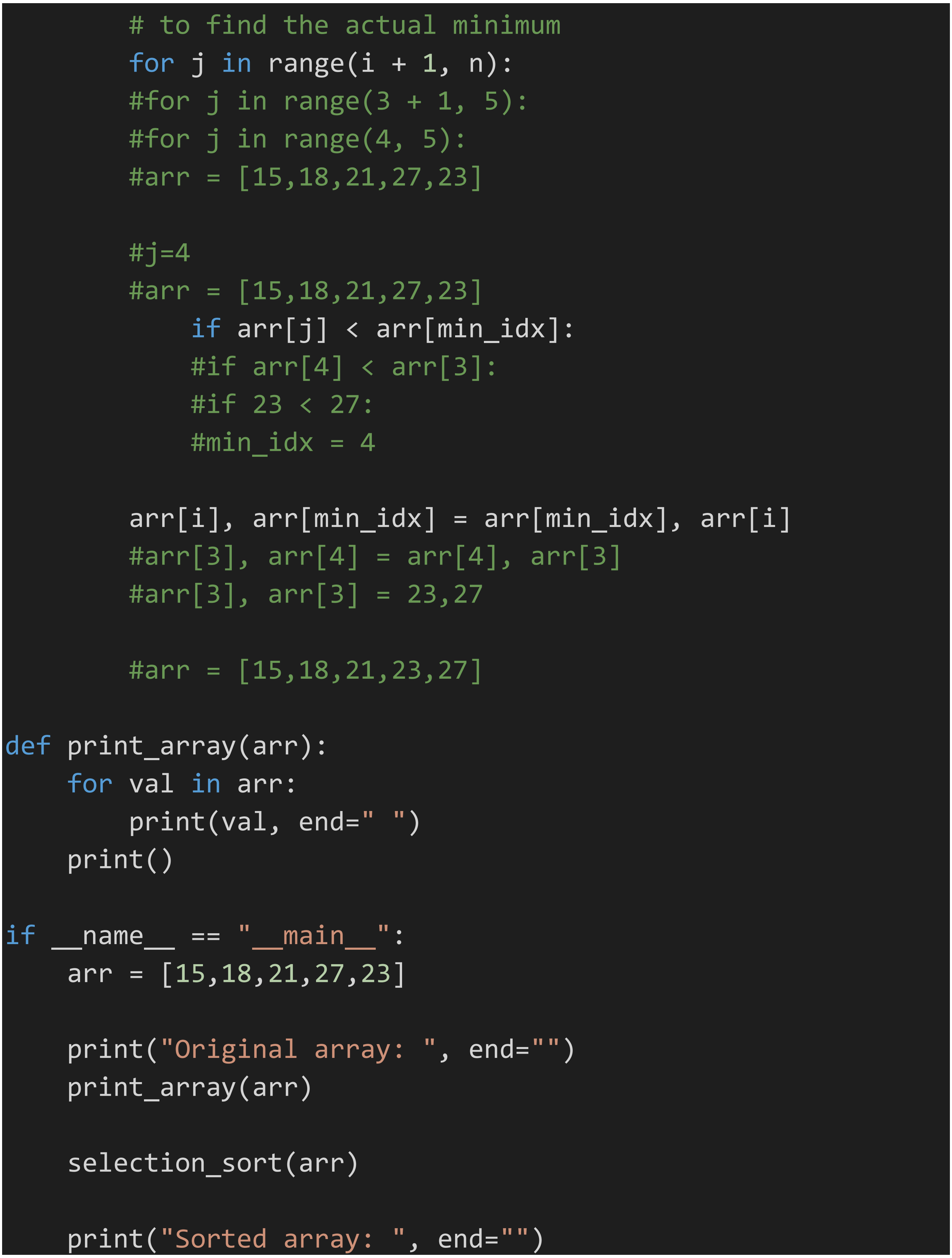
```
        for j in range(i + 1, n):
        #for j in range(0 + 1, 5):
        #for j in range(1, 5):
        #j=1
        #arr = [15,27,23,18,21]
            if arr[j] < arr[min_idx]:
            #if arr[1] < arr[0]:
            #if 27 < 15:

                # # Update min_idx if a smaller element is
found
                # min_idx = j
                # #min_idx = 0

        #j=2
        #arr = [15,27,23,18,21
            if arr[j] < arr[min_idx]:
            #if arr[2] < arr[0]:
            #if 23 < 15:

                # Update min_idx if a smaller element is
found
                min_idx = j
                #min_idx = 0

        #j=3
        #arr = [15,27,23,18,21]
            if arr[j] < arr[min_idx]:
            #if arr[3] < arr[0]:
            #if 18 < 15:
                # Update min_idx if a smaller element is
found
                min_idx = j
                #min_idx = 0
        # Move minimum element to its
        # correct position

        #j=4
        #arr = [15,27,23,18,21
            if arr[j] < arr[min_idx]:
            #if arr[4] < arr[0]:
            #if 21 < 15:
                # Update min_idx if a smaller element is
found
                min_idx = j
                #min_idx = 0
        # Move minimum element to its
        # correct position
        #arr = [15,27,23,18,21]


 #i=1
        # Assume the current position holds
        # the minimum element
        min_idx = i
        #min_idx = 1

        # Iterate through the unsorted portion
        # to find the actual minimum
        for j in range(i + 1, n):
        #for j in range(1 + 1, 5):
        #for j in range(2, 5):
        #arr = [15,27,23,18,21]
        #j=2
            if arr[j] < arr[min_idx]:
            #if arr[2] < arr[1]:
```



```
            #if 23 < 27 :
                # Update min_idx if a smaller element is
found
                min_idx = j
                #min_idx = 2

        #j=3
        #arr = [15,27,23,18,21]
            if arr[j] < arr[min_idx]:
            #if arr[3] < arr[2]:
            #if 18 < 23:
            #min_idx = j
            # min_idx = 3

        #j=4
        #arr = [15,27,23,18,21]
            if arr[j] < arr[min_idx]:
            #if arr[4] < arr[3]:
            #if 21 < 18:

        arr[i], arr[min_idx] = arr[min_idx], arr[i]
        #arr[i], arr[min_idx] = arr[min_idx], arr[i]
        #arr[i], arr[min_idx] = arr[1], arr[3]
        # 27, 18 = 18 , 27
        #arr[i], arr[min_idx] = 18, 27
        #arr = [15,18,23,27,21]

    #i=2
        # Assume the current position holds
        # the minimum element
        min_idx = i
        #min_idx = 2
```



```
        # Iterate through the unsorted portion
        # to find the actual minimum
        for j in range(i + 1, n):
        #for j in range(2 + 1, 5):
        #for j in range(3, 5):
        #arr = [15,18,23,27,21]
        #j=3
            if arr[j] < arr[min_idx]:
            #if arr[3] < arr[2]:
            #if 27 < 23:
             min_idx = j
                #min_idx = 2

        #j=4
        #arr = [15,18,23,27,21]
            if arr[j] < arr[min_idx]:
            #if arr[4] < arr[2]:
            #if 21 < 23:
            #min_idx = 4

        arr[i], arr[min_idx] = arr[min_idx], arr[i]
        #arr[i], arr[min_idx] = arr[2], arr[4]
        #arr[i], arr[min_idx] = 21 , 23

        #arr = [15,18,21,27,23]

    #i=3
        # Assume the current position holds
        # the minimum element
        min_idx = i
        #min_idx = 3

        # Iterate through the unsorted portion
```



```
        # to find the actual minimum
        for j in range(i + 1, n):
        #for j in range(3 + 1, 5):
        #for j in range(4, 5):
        #arr = [15,18,21,27,23]

        #j=4
        #arr = [15,18,21,27,23]
            if arr[j] < arr[min_idx]:
            #if arr[4] < arr[3]:
            #if 23 < 27:
            #min_idx = 4

        arr[i], arr[min_idx] = arr[min_idx], arr[i]
        #arr[3], arr[4] = arr[4], arr[3]
        #arr[3], arr[3] = 23,27

        #arr = [15,18,21,23,27]

def print_array(arr):
    for val in arr:
        print(val, end=" ")
    print()

if __name__ == "__main__":
    arr = [15,18,21,27,23]

    print("Original array: ", end="")
    print_array(arr)

    selection_sort(arr)

    print("Sorted array: ", end="")
    print_array(arr)
```

Output Program

Berikan penjelasan singkat tentang apa yang Anda lakukan, hasil yang Anda peroleh, dan apa yang dapat dipelajari dari percobaan tersebut.

Percobaan 3.

Listing Code program di masukkan dalam tabel

Output Program

Berikan penjelasan singkat tentang apa yang Anda lakukan, hasil yang Anda peroleh, dan apa yang dapat dipelajari dari percobaan tersebut.