

| i) | Bytecode: | Explanation of bytecode: | Local variables: | | ii) | Bytecode: | Explanation of bytecode: | Local variables: |
|----|------------------------|---|------------------|--|-----|------------------|---|------------------|
| | IL_0000: ldc.i4.0 | Initiates i=0 | (int32 V_0, i | | | 0: iconst_0 | pushes int 0 onto stack | V_1 i |
| | IL_0001: stloc.0 | Stores i in V_0 | int32 V_1, Least | | | 1: istore_1 | stores int 0 on V_1 | V_2 least |
| | IL_0002: br.s IL_0032 | Jumps to IL_0032 | int32 V_2, tmp | | | 2: iload_1 | loads V_1 onto stack | V_3 j |
| | | | int32 V_3) j | | | 3: aload_0 | loads first arguments (int arr) | |
| | IL_0004: ldloc.0 | Loads i from V_0 onto stack | | | | 4: arraylength | Loads length of array | |
| | IL_0005: stloc.1 | Store i in V_1 (least = i) | | | | 5: if_icmpge 57 | If i >= length jump to 57 | |
| | IL_0006: ldloc.0 | Loads i from V_0 onto stack | | | | 8: iload_1 | load V_1 (i) | |
| | IL_0007: ldc.i4.1 | Loads constant int 1 onto stack | | | | 9: istore_2 | Stores i on V_2 (least = i) | |
| | IL_0008: add | Adds i and 1 (numbers on stack) | | | | 10: iload_1 | load V_1 (i) onto stack | |
| | IL_0009: stloc.3 | Store j in V_3 (j = i + 1) | | | | 11: iconst_1 | load constant int 1 onto stack | |
| | IL_000a: br.s IL_001a | Jumps to IL_001a | | | | 12: iadd | add 1 to V_1 and push to stack | |
| | | | | | | 13: istore_3 | store addition in V_3 (i++) | |
| | IL_000c: ldarg.0 | Load array onto stack | | | | 14: iload_3 | load V_3 (j) onto stack | |
| | IL_000d: ldloc.3 | Load V_3 (j) onto stack | | | | 15: aload_0 | load array onto stack | |
| | IL_000e: ldelem.i4 | Load element at index j from array onto stack | | | | 16: arraylength | Loads length of array | |
| | IL_000f: ldarg.0 | Load array onto stack | | | | 17: if_icmpge 37 | If j >= length jump to 37 | |
| | IL_0010: ldloc.1 | Load V_1 (least) onto stack | | | | 20: aload_0 | load array onto stack | |
| | IL_0011: ldelem.i4 | Load element at index least from array onto stack | | | | 21: iload_3 | load V_3 (j) onto stack | |
| | IL_0012: bge.s IL_0016 | If array[j] >= array[least] jump to IL_0016 | | | | 22: iaload | load element at index V_3 from array onto stack | |
| | | | | | | 23: aload_0 | load array onto stack | |
| | IL_0014: ldloc.3 | load V_3 onto stack | | | | 24: iload_2 | load V_2 (least) onto stack | |
| | IL_0015: stloc.1 | store value of V_3 on V_1 (least = j) | | | | 25: aload_0 | load element at index V_2 from array onto stack | |
| | IL_0016: ldloc.3 | load V_3 onto stack | | | | 26: if_icmpge 31 | If arr[least] >= arr[j] jump to 31 | |
| | IL_0017: ldc.i4.1 | load constant int 1 onto stack | | | | 29: iload_3 | load V_3 (j) onto stack | |
| | IL_0018: add | add 1 and V_3 (j) | | | | 30: istore_2 | store V_3 on V_2 (least = j) | |
| | IL_0019: stloc.3 | store value of V_3 + 1 on V_3 (j++) | | | | 31: ilinc 3, 1 | Increment V_3 by 1 | |
| | IL_001a: ldloc.3 | Loads V_3 onto stack | | | | 34: goto 14 | Jump to 14 | |
| | IL_001b: ldarg.0 | Loads array onto stack | | | | 37: aload_0 | load array onto stack | |
| | IL_001c: ldlen | Loads length of array onto stack | | | | 38: iload_1 | load V_1 (i) onto stack | |
| | IL_001d: conv.i4 | converts length to int | | | | 39: iaload | load element at index V_1 from array onto stack | |
| | IL_001e: blt.s IL_000c | If V_3 (j) < length jump to IL_000c | | | | 40: istore_3 | store at V_3 | |
| | | | | | | 41: aload_0 | load array onto stack | |
| | IL_0020: ldarg.0 | load array onto stack | | | | 42: iload_1 | load V_1 onto stack | |
| | IL_0021: ldloc.0 | load constant V_0 (i) onto stack | | | | 43: aload_0 | load array onto stack | |
| | IL_0022: ldelem.i4 | Load element at index V_0 from array onto stack | | | | 44: iload_2 | load V_2 onto stack | |
| | IL_0023: stloc.2 | Store array[i] on V_2 (tmp) | | | | 45: iaload | load element at index V_2 from array onto stack | |
| | IL_0024: ldarg.0 | load array onto stack | | | | 46: iastore | store arr[i] = arr[least] | |
| | IL_0025: ldloc.0 | Load V_0 onto stack | | | | 47: aload_0 | load array onto stack | |
| | IL_0026: ldarg.0 | load array onto stack | | | | 48: iload_2 | load V_2 onto stack | |
| | IL_0027: ldloc.1 | load V_1 onto stack | | | | 49: iload_3 | load V_3 (j) onto stack | |
| | IL_0028: ldelem.i4 | Load element at index V_1 (least) from array onto stack | | | | 50: iastore | store arr[least] = arr[tmp] | |
| | IL_0029: stelem.i4 | Store array[i] V_0 on array[least] V_1 | | | | 51: ilinc 1, 1 | increment V_1 by 1 | |
| | IL_002a: ldarg.0 | load array onto stack | | | | 54: goto 2 | Go to 2 | |
| | IL_002b: ldloc.1 | load V_1 (least) onto stack | | | | 57: return | return | |
| | IL_002c: ldloc.2 | load V_2 (tmp) onto stack | | | | | | |
| | IL_002d: stelem.i4 | Store array[tmp] (V_2) on array[least] (V_1) | | | | | | |
| | IL_002e: ldloc.0 | Load V_0 onto stack | | | | | | |
| | IL_002f: ldc.i4.1 | load constant int 1 onto stack | | | | | | |
| | IL_0030: add | add 1 and V_0 (i) | | | | | | |
| | IL_0031: stloc.0 | Store on V_0 (i++) | | | | | | |
| | IL_0032: ldloc.0 | Loads V_0 onto stack | | | | | | |
| | IL_0033: ldarg.0 | Loads array onto stack | | | | | | |
| | IL_0034: ldlen | Loads length of array an put onto stack | | | | | | |
| | IL_0035: conv.i4 | Converts length to int | | | | | | |
| | IL_0036: blt.s IL_0004 | If i < length of array, jumps to IL_0004 | | | | | | |
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| | IL_0038: ret | Return | | | | | | |