



ESCUELA POLITÉCNICA NACIONAL  
FACULTAD DE INGENIERÍA DE SISTEMAS  
INGENIERÍA EN COMPUTACIÓN

---

ESCUELA POLITÉCNICA NACIONAL  
FACULTAD DE INGENIERÍA DE SISTEMAS  
CARRERA DE INGENIERIA EN CIENCIA DE DATOS E INTELIGENCIA ARTIFICIAL

**Nombres:** Andrés Merino, Josue Palma

Estructura de datos y algoritmos I

**Tema: Menú de Ordenamiento**

**Pasos para Bubble Sort:**

Lista Actual: [15, 68, 38, 42, 12, 94, 90, 29, 10, 29, 51, 20, 44, 52, 18, 100, 90, 99, 100, 96]

Paso: 1 [15, 38, 68, 42, 12, 94, 90, 29, 10, 29, 51, 20, 44, 52, 18, 100, 90, 99, 100, 96]

Paso: 2 [15, 38, 42, 68, 12, 94, 90, 29, 10, 29, 51, 20, 44, 52, 18, 100, 90, 99, 100, 96]

Paso: 3 [15, 38, 42, 12, 68, 94, 90, 29, 10, 29, 51, 20, 44, 52, 18, 100, 90, 99, 100, 96]

Paso: 4 [15, 38, 42, 12, 68, 90, 94, 29, 10, 29, 51, 20, 44, 52, 18, 100, 90, 99, 100, 96]

Paso: 5 [15, 38, 42, 12, 68, 90, 29, 94, 10, 29, 51, 20, 44, 52, 18, 100, 90, 99, 100, 96]

Paso: 6 [15, 38, 42, 12, 68, 90, 29, 10, 94, 29, 51, 20, 44, 52, 18, 100, 90, 99, 100, 96]

Paso: 7 [15, 38, 42, 12, 68, 90, 29, 10, 29, 94, 51, 20, 44, 52, 18, 100, 90, 99, 100, 96]

Paso: 8 [15, 38, 42, 12, 68, 90, 29, 10, 29, 51, 94, 20, 44, 52, 18, 100, 90, 99, 100, 96]

Paso: 9 [15, 38, 42, 12, 68, 90, 29, 10, 29, 51, 20, 94, 44, 52, 18, 100, 90, 99, 100, 96]

Paso: 10 [15, 38, 42, 12, 68, 90, 29, 10, 29, 51, 20, 44, 94, 52, 18, 100, 90, 99, 100, 96]

Paso: 11 [15, 38, 42, 12, 68, 90, 29, 10, 29, 51, 20, 44, 52, 94, 18, 100, 90, 99, 100, 96]

Paso: 12 [15, 38, 42, 12, 68, 90, 29, 10, 29, 51, 20, 44, 52, 18, 94, 100, 90, 99, 100, 96]

Paso: 13 [15, 38, 42, 12, 68, 90, 29, 10, 29, 51, 20, 44, 52, 18, 94, 90, 100, 99, 100, 96]

Paso: 14 [15, 38, 42, 12, 68, 90, 29, 10, 29, 51, 20, 44, 52, 18, 94, 90, 99, 100, 100, 96]

Paso: 15 [15, 38, 42, 12, 68, 90, 29, 10, 29, 51, 20, 44, 52, 18, 94, 90, 99, 100, 96, 100]

Paso: 16 [15, 38, 12, 42, 68, 90, 29, 10, 29, 51, 20, 44, 52, 18, 94, 90, 99, 100, 96, 100]



ESCUELA POLITÉCNICA NACIONAL  
FACULTAD DE INGENIERÍA DE SISTEMAS  
INGENIERÍA EN COMPUTACIÓN

---

Paso: 17 [15, 38, 12, 42, 68, 29, 90, 10, 29, 51, 20, 44, 52, 18, 94, 90, 99, 100, 96, 100]

Paso: 18 [15, 38, 12, 42, 68, 29, 10, 90, 29, 51, 20, 44, 52, 18, 94, 90, 99, 100, 96, 100]

Paso: 19 [15, 38, 12, 42, 68, 29, 10, 29, 90, 51, 20, 44, 52, 18, 94, 90, 99, 100, 96, 100]

Paso: 20 [15, 38, 12, 42, 68, 29, 10, 29, 51, 90, 20, 44, 52, 18, 94, 90, 99, 100, 96, 100]

Paso: 21 [15, 38, 12, 42, 68, 29, 10, 29, 51, 20, 90, 44, 52, 18, 94, 90, 99, 100, 96, 100]

Paso: 22 [15, 38, 12, 42, 68, 29, 10, 29, 51, 20, 44, 90, 52, 18, 94, 90, 99, 100, 96, 100]

Paso: 23 [15, 38, 12, 42, 68, 29, 10, 29, 51, 20, 44, 52, 90, 18, 94, 90, 99, 100, 96, 100]

Paso: 24 [15, 38, 12, 42, 68, 29, 10, 29, 51, 20, 44, 52, 18, 90, 94, 90, 99, 100, 96, 100]

Paso: 25 [15, 38, 12, 42, 68, 29, 10, 29, 51, 20, 44, 52, 18, 90, 90, 94, 99, 100, 96, 100]

Paso: 26 [15, 38, 12, 42, 68, 29, 10, 29, 51, 20, 44, 52, 18, 90, 90, 94, 99, 96, 100, 100]

Paso: 27 [15, 12, 38, 42, 68, 29, 10, 29, 51, 20, 44, 52, 18, 90, 90, 94, 99, 96, 100, 100]

Paso: 28 [15, 12, 38, 42, 29, 68, 10, 29, 51, 20, 44, 52, 18, 90, 90, 94, 99, 96, 100, 100]

Paso: 29 [15, 12, 38, 42, 29, 10, 68, 29, 51, 20, 44, 52, 18, 90, 90, 94, 99, 96, 100, 100]

Paso: 30 [15, 12, 38, 42, 29, 10, 29, 68, 51, 20, 44, 52, 18, 90, 90, 94, 99, 96, 100, 100]

Paso: 31 [15, 12, 38, 42, 29, 10, 29, 51, 68, 20, 44, 52, 18, 90, 90, 94, 99, 96, 100, 100]

Paso: 32 [15, 12, 38, 42, 29, 10, 29, 51, 20, 68, 44, 52, 18, 90, 90, 94, 99, 96, 100, 100]

Paso: 33 [15, 12, 38, 42, 29, 10, 29, 51, 20, 44, 68, 52, 18, 90, 90, 94, 99, 96, 100, 100]

Paso: 34 [15, 12, 38, 42, 29, 10, 29, 51, 20, 44, 52, 68, 18, 90, 90, 94, 99, 96, 100, 100]

Paso: 35 [15, 12, 38, 42, 29, 10, 29, 51, 20, 44, 52, 18, 68, 90, 90, 94, 99, 96, 100, 100]

Paso: 36 [15, 12, 38, 42, 29, 10, 29, 51, 20, 44, 52, 18, 68, 90, 90, 94, 96, 99, 100, 100]

Paso: 37 [12, 15, 38, 42, 29, 10, 29, 51, 20, 44, 52, 18, 68, 90, 90, 94, 96, 99, 100, 100]

Paso: 38 [12, 15, 38, 29, 42, 10, 29, 51, 20, 44, 52, 18, 68, 90, 90, 94, 96, 99, 100, 100]

Paso: 39 [12, 15, 38, 29, 10, 42, 29, 51, 20, 44, 52, 18, 68, 90, 90, 94, 96, 99, 100, 100]

Paso: 40 [12, 15, 38, 29, 10, 29, 42, 51, 20, 44, 52, 18, 68, 90, 90, 94, 96, 99, 100, 100]



ESCUELA POLITÉCNICA NACIONAL  
FACULTAD DE INGENIERÍA DE SISTEMAS  
INGENIERÍA EN COMPUTACIÓN

Paso: 41 [12, 15, 38, 29, 10, 29, 42, 20, 51, 44, 52, 18, 68, 90, 90, 94, 96, 99, 100, 100]

Paso: 42 [12, 15, 38, 29, 10, 29, 42, 20, 44, 51, 52, 18, 68, 90, 90, 94, 96, 99, 100, 100]

Paso: 43 [12, 15, 38, 29, 10, 29, 42, 20, 44, 51, 18, 52, 68, 90, 90, 94, 96, 99, 100, 100]

Paso: 44 [12, 15, 29, 38, 10, 29, 42, 20, 44, 51, 18, 52, 68, 90, 90, 94, 96, 99, 100, 100]

Paso: 45 [12, 15, 29, 10, 38, 29, 42, 20, 44, 51, 18, 52, 68, 90, 90, 94, 96, 99, 100, 100]

Paso: 46 [12, 15, 29, 10, 29, 38, 42, 20, 44, 51, 18, 52, 68, 90, 90, 94, 96, 99, 100, 100]

Paso: 47 [12, 15, 29, 10, 29, 38, 20, 42, 44, 51, 18, 52, 68, 90, 90, 94, 96, 99, 100, 100]

Paso: 48 [12, 15, 29, 10, 29, 38, 20, 42, 44, 18, 51, 52, 68, 90, 90, 94, 96, 99, 100, 100]

Paso: 49 [12, 15, 10, 29, 29, 38, 20, 42, 44, 18, 51, 52, 68, 90, 90, 94, 96, 99, 100, 100]

Paso: 50 [12, 15, 10, 29, 29, 20, 38, 42, 44, 18, 51, 52, 68, 90, 90, 94, 96, 99, 100, 100]

Paso: 51 [12, 15, 10, 29, 29, 20, 38, 42, 18, 44, 51, 52, 68, 90, 90, 94, 96, 99, 100, 100]

Paso: 52 [12, 10, 15, 29, 29, 20, 38, 42, 18, 44, 51, 52, 68, 90, 90, 94, 96, 99, 100, 100]

Paso: 53 [12, 10, 15, 29, 20, 29, 38, 42, 18, 44, 51, 52, 68, 90, 90, 94, 96, 99, 100, 100]

Paso: 54 [12, 10, 15, 29, 20, 29, 38, 18, 42, 44, 51, 52, 68, 90, 90, 94, 96, 99, 100, 100]

Paso: 55 [10, 12, 15, 29, 20, 29, 38, 18, 42, 44, 51, 52, 68, 90, 90, 94, 96, 99, 100, 100]

Paso: 56 [10, 12, 15, 20, 29, 29, 38, 18, 42, 44, 51, 52, 68, 90, 90, 94, 96, 99, 100, 100]

Paso: 57 [10, 12, 15, 20, 29, 29, 18, 38, 42, 44, 51, 52, 68, 90, 90, 94, 96, 99, 100, 100]

Paso: 58 [10, 12, 15, 20, 29, 18, 29, 38, 42, 44, 51, 52, 68, 90, 90, 94, 96, 99, 100, 100]

Paso: 59 [10, 12, 15, 20, 18, 29, 29, 38, 42, 44, 51, 52, 68, 90, 90, 94, 96, 99, 100, 100]

Paso: 60 [10, 12, 15, 18, 20, 29, 29, 38, 42, 44, 51, 52, 68, 90, 90, 94, 96, 99, 100, 100]

Lista ordenada: [10, 12, 15, 18, 20, 29, 29, 38, 42, 44, 51, 52, 68, 90, 90, 94, 96, 99, 100, 100]

**Pasos para Insertion Sort:**

Paso 1: [15, 68, 38, 42, 12, 94, 90, 29, 10, 29, 51, 20, 44, 52, 18, 100, 90, 99, 100, 96]

Paso 2: [15, 38, 68, 42, 12, 94, 90, 29, 10, 29, 51, 20, 44, 52, 18, 100, 90, 99, 100, 96]



ESCUELA POLITÉCNICA NACIONAL  
FACULTAD DE INGENIERÍA DE SISTEMAS  
INGENIERÍA EN COMPUTACIÓN

Paso 3: [15, 38, 42, 68, 12, 94, 90, 29, 10, 29, 51, 20, 44, 52, 18, 100, 90, 99, 100, 96]  
Paso 4: [12, 15, 38, 42, 68, 94, 90, 29, 10, 29, 51, 20, 44, 52, 18, 100, 90, 99, 100, 96]  
Paso 5: [12, 15, 38, 42, 68, 94, 90, 29, 10, 29, 51, 20, 44, 52, 18, 100, 90, 99, 100, 96]  
Paso 6: [12, 15, 38, 42, 68, 90, 94, 29, 10, 29, 51, 20, 44, 52, 18, 100, 90, 99, 100, 96]  
Paso 7: [12, 15, 29, 38, 42, 68, 90, 94, 10, 29, 51, 20, 44, 52, 18, 100, 90, 99, 100, 96]  
Paso 8: [10, 12, 15, 29, 38, 42, 68, 90, 94, 29, 51, 20, 44, 52, 18, 100, 90, 99, 100, 96]  
Paso 9: [10, 12, 15, 29, 29, 38, 42, 68, 90, 94, 51, 20, 44, 52, 18, 100, 90, 99, 100, 96]  
Paso 10: [10, 12, 15, 29, 29, 38, 42, 51, 68, 90, 94, 20, 44, 52, 18, 100, 90, 99, 100, 96]  
Paso 11: [10, 12, 15, 20, 29, 29, 38, 42, 51, 68, 90, 94, 44, 52, 18, 100, 90, 99, 100, 96]  
Paso 12: [10, 12, 15, 20, 29, 29, 38, 42, 44, 51, 68, 90, 94, 52, 18, 100, 90, 99, 100, 96]  
Paso 13: [10, 12, 15, 20, 29, 29, 38, 42, 44, 51, 52, 68, 90, 94, 18, 100, 90, 99, 100, 96]  
Paso 14: [10, 12, 15, 18, 20, 29, 29, 38, 42, 44, 51, 52, 68, 90, 94, 100, 90, 99, 100, 96]  
Paso 15: [10, 12, 15, 18, 20, 29, 29, 38, 42, 44, 51, 52, 68, 90, 94, 100, 90, 99, 100, 96]  
Paso 16: [10, 12, 15, 18, 20, 29, 29, 38, 42, 44, 51, 52, 68, 90, 90, 94, 100, 99, 100, 96]  
Paso 17: [10, 12, 15, 18, 20, 29, 29, 38, 42, 44, 51, 52, 68, 90, 90, 94, 99, 100, 100, 96]  
Paso 18: [10, 12, 15, 18, 20, 29, 29, 38, 42, 44, 51, 52, 68, 90, 90, 94, 99, 100, 100, 96]  
Paso 19: [10, 12, 15, 18, 20, 29, 29, 38, 42, 44, 51, 52, 68, 90, 90, 94, 96, 99, 100, 100]  
Numeros ordenados: [10, 12, 15, 18, 20, 29, 29, 38, 42, 44, 51, 52, 68, 90, 90, 94, 96, 99, 100, 100]

**Programa completo:**

[15, 68, 38, 42, 12, 94, 90, 29, 10, 29, 51, 20, 44, 52, 18, 100, 90, 99, 100, 96]  
1. Bubble Sort  
2. Insertion Sort  
3. Salir  
Elije una opcion:  
1  
Lista Actual: [15, 68, 38, 42, 12, 94, 90, 29, 10, 29, 51, 20, 44, 52, 18, 100, 90, 99, 100, 96]



ESCUELA POLITÉCNICA NACIONAL  
FACULTAD DE INGENIERÍA DE SISTEMAS  
INGENIERÍA EN COMPUTACIÓN

---

Paso: 1 [15, 38, 68, 42, 12, 94, 90, 29, 10, 29, 51, 20, 44, 52, 18, 100, 90, 99, 100, 96]  
Paso: 2 [15, 38, 42, 68, 12, 94, 90, 29, 10, 29, 51, 20, 44, 52, 18, 100, 90, 99, 100, 96]  
Paso: 3 [15, 38, 42, 12, 68, 94, 90, 29, 10, 29, 51, 20, 44, 52, 18, 100, 90, 99, 100, 96]  
Paso: 4 [15, 38, 42, 12, 68, 90, 94, 29, 10, 29, 51, 20, 44, 52, 18, 100, 90, 99, 100, 96]  
Paso: 5 [15, 38, 42, 12, 68, 90, 29, 94, 10, 29, 51, 20, 44, 52, 18, 100, 90, 99, 100, 96]  
Paso: 6 [15, 38, 42, 12, 68, 90, 29, 10, 94, 29, 51, 20, 44, 52, 18, 100, 90, 99, 100, 96]  
Paso: 7 [15, 38, 42, 12, 68, 90, 29, 10, 29, 94, 51, 20, 44, 52, 18, 100, 90, 99, 100, 96]  
Paso: 8 [15, 38, 42, 12, 68, 90, 29, 10, 29, 51, 94, 20, 44, 52, 18, 100, 90, 99, 100, 96]  
Paso: 9 [15, 38, 42, 12, 68, 90, 29, 10, 29, 51, 20, 94, 44, 52, 18, 100, 90, 99, 100, 96]  
Paso: 10 [15, 38, 42, 12, 68, 90, 29, 10, 29, 51, 20, 44, 94, 52, 18, 100, 90, 99, 100, 96]  
Paso: 11 [15, 38, 42, 12, 68, 90, 29, 10, 29, 51, 20, 44, 52, 94, 18, 100, 90, 99, 100, 96]  
Paso: 12 [15, 38, 42, 12, 68, 90, 29, 10, 29, 51, 20, 44, 52, 18, 94, 100, 90, 99, 100, 96]  
Paso: 13 [15, 38, 42, 12, 68, 90, 29, 10, 29, 51, 20, 44, 52, 18, 94, 90, 100, 99, 100, 96]  
Paso: 14 [15, 38, 42, 12, 68, 90, 29, 10, 29, 51, 20, 44, 52, 18, 94, 90, 99, 100, 100, 96]  
Paso: 15 [15, 38, 42, 12, 68, 90, 29, 10, 29, 51, 20, 44, 52, 18, 94, 90, 99, 100, 96, 100]  
Paso: 16 [15, 38, 12, 42, 68, 90, 29, 10, 29, 51, 20, 44, 52, 18, 94, 90, 99, 100, 96, 100]  
Paso: 17 [15, 38, 12, 42, 68, 29, 90, 10, 29, 51, 20, 44, 52, 18, 94, 90, 99, 100, 96, 100]  
Paso: 18 [15, 38, 12, 42, 68, 29, 10, 90, 29, 51, 20, 44, 52, 18, 94, 90, 99, 100, 96, 100]  
Paso: 19 [15, 38, 12, 42, 68, 29, 10, 29, 90, 51, 20, 44, 52, 18, 94, 90, 99, 100, 96, 100]  
Paso: 20 [15, 38, 12, 42, 68, 29, 10, 29, 51, 90, 20, 44, 52, 18, 94, 90, 99, 100, 96, 100]  
Paso: 21 [15, 38, 12, 42, 68, 29, 10, 29, 51, 20, 90, 44, 52, 18, 94, 90, 99, 100, 96, 100]  
Paso: 22 [15, 38, 12, 42, 68, 29, 10, 29, 51, 20, 44, 90, 52, 18, 94, 90, 99, 100, 96, 100]  
Paso: 23 [15, 38, 12, 42, 68, 29, 10, 29, 51, 20, 44, 52, 90, 18, 94, 90, 99, 100, 96, 100]  
Paso: 24 [15, 38, 12, 42, 68, 29, 10, 29, 51, 20, 44, 52, 18, 90, 94, 90, 99, 100, 96, 100]



ESCUELA POLITÉCNICA NACIONAL  
FACULTAD DE INGENIERÍA DE SISTEMAS  
INGENIERÍA EN COMPUTACIÓN

---

Paso: 25 [15, 38, 12, 42, 68, 29, 10, 29, 51, 20, 44, 52, 18, 90, 90, 94, 99, 100, 96, 100]

Paso: 26 [15, 38, 12, 42, 68, 29, 10, 29, 51, 20, 44, 52, 18, 90, 90, 94, 99, 96, 100, 100]

Paso: 27 [15, 12, 38, 42, 68, 29, 10, 29, 51, 20, 44, 52, 18, 90, 90, 94, 99, 96, 100, 100]

Paso: 28 [15, 12, 38, 42, 29, 68, 10, 29, 51, 20, 44, 52, 18, 90, 90, 94, 99, 96, 100, 100]

Paso: 29 [15, 12, 38, 42, 29, 10, 68, 29, 51, 20, 44, 52, 18, 90, 90, 94, 99, 96, 100, 100]

Paso: 30 [15, 12, 38, 42, 29, 10, 29, 68, 51, 20, 44, 52, 18, 90, 90, 94, 99, 96, 100, 100]

Paso: 31 [15, 12, 38, 42, 29, 10, 29, 51, 68, 20, 44, 52, 18, 90, 90, 94, 99, 96, 100, 100]

Paso: 32 [15, 12, 38, 42, 29, 10, 29, 51, 20, 68, 44, 52, 18, 90, 90, 94, 99, 96, 100, 100]

Paso: 33 [15, 12, 38, 42, 29, 10, 29, 51, 20, 44, 68, 52, 18, 90, 90, 94, 99, 96, 100, 100]

Paso: 34 [15, 12, 38, 42, 29, 10, 29, 51, 20, 44, 52, 68, 18, 90, 90, 94, 99, 96, 100, 100]

Paso: 35 [15, 12, 38, 42, 29, 10, 29, 51, 20, 44, 52, 18, 68, 90, 90, 94, 99, 96, 100, 100]

Paso: 36 [15, 12, 38, 42, 29, 10, 29, 51, 20, 44, 52, 18, 68, 90, 90, 94, 96, 99, 100, 100]

Paso: 37 [12, 15, 38, 42, 29, 10, 29, 51, 20, 44, 52, 18, 68, 90, 90, 94, 96, 99, 100, 100]

Paso: 38 [12, 15, 38, 29, 42, 10, 29, 51, 20, 44, 52, 18, 68, 90, 90, 94, 96, 99, 100, 100]

Paso: 39 [12, 15, 38, 29, 10, 42, 29, 51, 20, 44, 52, 18, 68, 90, 90, 94, 96, 99, 100, 100]

Paso: 40 [12, 15, 38, 29, 10, 29, 42, 51, 20, 44, 52, 18, 68, 90, 90, 94, 96, 99, 100, 100]

Paso: 41 [12, 15, 38, 29, 10, 29, 42, 20, 51, 44, 52, 18, 68, 90, 90, 94, 96, 99, 100, 100]

Paso: 42 [12, 15, 38, 29, 10, 29, 42, 20, 44, 51, 52, 18, 68, 90, 90, 94, 96, 99, 100, 100]

Paso: 43 [12, 15, 38, 29, 10, 29, 42, 20, 44, 51, 18, 52, 68, 90, 90, 94, 96, 99, 100, 100]

Paso: 44 [12, 15, 29, 38, 10, 29, 42, 20, 44, 51, 18, 52, 68, 90, 90, 94, 96, 99, 100, 100]

Paso: 45 [12, 15, 29, 10, 38, 29, 42, 20, 44, 51, 18, 52, 68, 90, 90, 94, 96, 99, 100, 100]

Paso: 46 [12, 15, 29, 10, 29, 38, 42, 20, 44, 51, 18, 52, 68, 90, 90, 94, 96, 99, 100, 100]

Paso: 47 [12, 15, 29, 10, 29, 38, 20, 42, 44, 51, 18, 52, 68, 90, 90, 94, 96, 99, 100, 100]

Paso: 48 [12, 15, 29, 10, 29, 38, 20, 42, 44, 18, 51, 52, 68, 90, 90, 94, 96, 99, 100, 100]



ESCUELA POLITÉCNICA NACIONAL  
FACULTAD DE INGENIERÍA DE SISTEMAS  
INGENIERÍA EN COMPUTACIÓN

Paso: 49 [12, 15, 10, 29, 29, 38, 20, 42, 44, 18, 51, 52, 68, 90, 90, 94, 96, 99, 100, 100]

Paso: 50 [12, 15, 10, 29, 29, 20, 38, 42, 44, 18, 51, 52, 68, 90, 90, 94, 96, 99, 100, 100]

Paso: 51 [12, 15, 10, 29, 29, 20, 38, 42, 18, 44, 51, 52, 68, 90, 90, 94, 96, 99, 100, 100]

Paso: 52 [12, 10, 15, 29, 29, 20, 38, 42, 18, 44, 51, 52, 68, 90, 90, 94, 96, 99, 100, 100]

Paso: 53 [12, 10, 15, 29, 20, 29, 38, 42, 18, 44, 51, 52, 68, 90, 90, 94, 96, 99, 100, 100]

Paso: 54 [12, 10, 15, 29, 20, 29, 38, 18, 42, 44, 51, 52, 68, 90, 90, 94, 96, 99, 100, 100]

Paso: 55 [10, 12, 15, 29, 20, 29, 38, 18, 42, 44, 51, 52, 68, 90, 90, 94, 96, 99, 100, 100]

Paso: 56 [10, 12, 15, 20, 29, 29, 38, 18, 42, 44, 51, 52, 68, 90, 90, 94, 96, 99, 100, 100]

Paso: 57 [10, 12, 15, 20, 29, 29, 18, 38, 42, 44, 51, 52, 68, 90, 90, 94, 96, 99, 100, 100]

Paso: 58 [10, 12, 15, 20, 29, 18, 29, 38, 42, 44, 51, 52, 68, 90, 90, 94, 96, 99, 100, 100]

Paso: 59 [10, 12, 15, 20, 18, 29, 29, 38, 42, 44, 51, 52, 68, 90, 90, 94, 96, 99, 100, 100]

Paso: 60 [10, 12, 15, 18, 20, 29, 29, 38, 42, 44, 51, 52, 68, 90, 90, 94, 96, 99, 100, 100]

Lista ordenada: [10, 12, 15, 18, 20, 29, 29, 38, 42, 44, 51, 52, 68, 90, 90, 94, 96, 99, 100, 100]

1. Bubble Sort
2. Insertion Sort
3. Salir

Elije una opcion:

2

Paso 1: [15, 68, 38, 42, 12, 94, 90, 29, 10, 29, 51, 20, 44, 52, 18, 100, 90, 99, 100, 96]

Paso 2: [15, 38, 68, 42, 12, 94, 90, 29, 10, 29, 51, 20, 44, 52, 18, 100, 90, 99, 100, 96]

Paso 3: [15, 38, 42, 68, 12, 94, 90, 29, 10, 29, 51, 20, 44, 52, 18, 100, 90, 99, 100, 96]

Paso 4: [12, 15, 38, 42, 68, 94, 90, 29, 10, 29, 51, 20, 44, 52, 18, 100, 90, 99, 100, 96]

Paso 5: [12, 15, 38, 42, 68, 94, 90, 29, 10, 29, 51, 20, 44, 52, 18, 100, 90, 99, 100, 96]

Paso 6: [12, 15, 38, 42, 68, 90, 94, 29, 10, 29, 51, 20, 44, 52, 18, 100, 90, 99, 100, 96]

Paso 7: [12, 15, 29, 38, 42, 68, 90, 94, 10, 29, 51, 20, 44, 52, 18, 100, 90, 99, 100, 96]

Paso 8: [10, 12, 15, 29, 38, 42, 68, 90, 94, 29, 51, 20, 44, 52, 18, 100, 90, 99, 100, 96]

Paso 9: [10, 12, 15, 29, 29, 38, 42, 68, 90, 94, 51, 20, 44, 52, 18, 100, 90, 99, 100, 96]



ESCUELA POLITÉCNICA NACIONAL  
FACULTAD DE INGENIERÍA DE SISTEMAS  
INGENIERÍA EN COMPUTACIÓN

Paso 10: [10, 12, 15, 29, 29, 38, 42, 51, 68, 90, 94, 20, 44, 52, 18, 100, 90, 99, 100, 96]

Paso 11: [10, 12, 15, 20, 29, 29, 38, 42, 51, 68, 90, 94, 44, 52, 18, 100, 90, 99, 100, 96]

Paso 12: [10, 12, 15, 20, 29, 29, 38, 42, 44, 51, 68, 90, 94, 52, 18, 100, 90, 99, 100, 96]

Paso 13: [10, 12, 15, 20, 29, 29, 38, 42, 44, 51, 52, 68, 90, 94, 18, 100, 90, 99, 100, 96]

Paso 14: [10, 12, 15, 18, 20, 29, 29, 38, 42, 44, 51, 52, 68, 90, 94, 100, 90, 99, 100, 96]

Paso 15: [10, 12, 15, 18, 20, 29, 29, 38, 42, 44, 51, 52, 68, 90, 94, 100, 90, 99, 100, 96]

Paso 16: [10, 12, 15, 18, 20, 29, 29, 38, 42, 44, 51, 52, 68, 90, 90, 94, 100, 99, 100, 96]

Paso 17: [10, 12, 15, 18, 20, 29, 29, 38, 42, 44, 51, 52, 68, 90, 90, 94, 99, 100, 100, 96]

Paso 18: [10, 12, 15, 18, 20, 29, 29, 38, 42, 44, 51, 52, 68, 90, 90, 94, 99, 100, 100, 96]

Paso 19: [10, 12, 15, 18, 20, 29, 29, 38, 42, 44, 51, 52, 68, 90, 90, 94, 96, 99, 100, 100]

Numeros ordenados: [10, 12, 15, 18, 20, 29, 29, 38, 42, 44, 51, 52, 68, 90, 90, 94, 96, 99, 100, 100]

1. Bubble Sort  
2. Insertion Sort  
3. Salir  
Elije una opcion:  
3

-----

BUILD SUCCESS

-----

Total time: 03:22 min  
Finished at: 2025-10-11T17:52:19-05:00

-----