**CSC 2104 Data Structures and Algorithms I**

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**Section : 1**

**Difference between Insertion Sort Algorithm and Bubble Sort Algorithm**

**Insertion Sort**

1. The algorithm starts with the first value in the array.
2. Since there is no value in the previous array, the second value is analysed.
3. If the previous value is higher than the second value, then the previous value will move to the second value’s position in the array.
4. Then, the second value will be positioned in the emptied position.
5. For the third value, fourth value and so on, step 2 until 4 are repeated.
6. The only difference is the number of previous values that will be moved from previous positions and the position that will be assigned for each value after every increment.

**Bubble Sort Algorithm**

1. The algorithm starts with the first value in the array.
2. The next value will be analysed.
3. If the first value is higher than the next value, the values will replace each other’s position.
4. Step 2 and 3 are repeated until the next value is already higher than the first value.
5. For the second value, third value and so on, step 2 until 4 are repeated.

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| **5** | **2** | **3** | **4** | **6** | **8** | **7** | **9** | **10** | **1** |

**Insertion Sort**

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **5** |  | **3** | **4** | **6** | **8** | **7** | **9** | **10** | **1** |

**2**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **2** | **5** |  | **4** | **6** | **8** | **7** | **9** | **10** | **1** |

**3**

|  |  |  |  |  |  |  |  |  |  |
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| **2** | **3** | **5** |  | **6** | **8** | **7** | **9** | **10** | **1** |

**4**

|  |  |  |  |  |  |  |  |  |  |
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| **2** | **3** | **4** | **5** | **6** | **8** |  | **9** | **10** | **1** |

**7**

|  |  |  |  |  |  |  |  |  |  |
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| **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** |  |

**1**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** |

**Bubble Sort**

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **5** | **2** | **3** | **4** | **6** | **8** | **7** | **9** | **10** | **1** |

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| **2** | **5** | **3** | **4** | **6** | **8** | **7** | **9** | **10** | **1** |

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| **2** | **3** | **5** | **4** | **6** | **8** | **7** | **9** | **10** | **1** |

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| **2** | **3** | **4** | **5** | **6** | **8** | **7** | **9** | **10** | **1** |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **1** |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **1** | **10** |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **2** | **3** | **4** | **5** | **6** | **7** | **8** | **1** | **9** | **10** |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **2** | **3** | **4** | **5** | **6** | **7** | **1** | **8** | **9** | **10** |

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| **2** | **3** | **4** | **5** | **6** | **1** | **7** | **8** | **9** | **10** |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **2** | **3** | **4** | **5** | **1** | **6** | **7** | **8** | **9** | **10** |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **2** | **3** | **4** | **1** | **5** | **6** | **7** | **8** | **9** | **10** |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **2** | **3** | **1** | **4** | **5** | **6** | **7** | **8** | **9** | **10** |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **2** | **1** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** |