**Assignment 5**

**Question 1**

**Bubble Sort**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Iteration | 34 | 8 | 64 | 51 | 32 | 21 |
| 0 | 8 | 34 | 51 | 32 | 21 | 64 |
| 1 | 8 | 34 | 32 | 21 | 51 | 64 |
| 2 | 8 | 32 | 21 | 34 | 51 | 64 |
| 3 | 8 | 21 | 32 | 34 | 51 | 64 |

|  |  |  |
| --- | --- | --- |
| Iteration | Inversions | #Inversions |
| 0 | (34, 8), (34,32), (34, 21), (64, 51), (64, 32), (64, 21), (51, 32), (51, 21), (32, 21) | 9 |
| 1 | (34, 32), (34, 21), (51, 32), (51, 21), (32, 21) | 5 |
| 2 | (34, 32), (34, 21), (32, 21) | 3 |
| 3 | (32, 21) | 1 |

**Total number of inversions for Bubble Sort = 18**

**Selection Sort**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Iteration | 34 | 8 | 64 | 51 | 32 | 21 |
| 0 | 8 | 34 | 64 | 51 | 32 | 21 |
| 1 | 8 | 21 | 64 | 51 | 32 | 34 |
| 2 | 8 | 21 | 32 | 51 | 64 | 34 |
| 3 | 8 | 21 | 32 | 34 | 64 | 51 |
| 4 | 8 | 21 | 32 | 34 | 51 | 64 |

|  |  |  |
| --- | --- | --- |
| Iteration | Inversions | #Inversions |
| 0 | (34, 8), (34,32), (34, 21), (64, 51), (64, 32), (64, 21), (51, 32), (51, 21), (32, 21) | 9 |
| 1 | (34, 32), (34, 21), (64, 5), (64, 32), (64, 21), (51, 32), (51, 21), (32, 21) | 8 |
| 2 | (64, 51), (64, 32), (64, 34), (51, 32), (51, 34) | 5 |
| 3 | (51, 34), (64, 34) | 2 |
| 4 | (64, 51) | 1 |

**Total number of inversions for Selection Sort = 25**