**Name:** Michael Mullarkey (16204743)

**1)**

**i)** a = 5, output = 6 **ii)** 3 Operations **iii)** O(1)

**2)**

**i)** a = 2, b = 2**,** output = 2 **ii)** 2 Operations **iii)** O(1)

**3)**

**i)** a = 3, b = 2**,** output = 3 **ii)** 2 Operations **iii)** O(1)

**4)**

**i)** a = 3, b = 2**,** output = 1 **ii)** 3 Operations **iii)** O(1)

**5)**

**i)** A = {5,3,4,1,2}, n = 5, output = 1 **ii)** 4n-1 + 3 Operations **iii)** O(n)

|  |  |  |
| --- | --- | --- |
| **K** | **minValue** | **A[k]** |
|  | 5 |  |
| 1 | 5 | 3 |
| 2 | 3 | 4 |
| 3 | 3 | 1 |
| 4 | 1 | 2 |

**6)**

**i)** A = {5,3,4,1,2}, n = 5, output = 3 **ii)** 4n-1 + 3 Operations **iii)** O(n)

|  |  |  |  |
| --- | --- | --- | --- |
| **K** | **A[minValueIndex]** | **A[k]** | **minValueIndex** |
|  |  |  | 0 |
| 1 | 5 | 3 | 1 |
| 2 | 3 | 4 | 1 |
| 3 | 3 | 1 | 3 |
| 4 | 1 | 2 | 3 |

**7)**

**i)** A = {5,3,4,1,2}, n = 5, output = 3 **ii)** 6n-1 + 3 Operations **iii)** O(n)

|  |  |  |  |
| --- | --- | --- | --- |
| **j** | **A[j]** | **X[j]** | **runningSum** |
|  |  |  | 0 |
| 0 | 5 | 5 | 5 |
| 1 | 3 | 5, 4 | 8 |
| 2 | 4 | 5, 4, 4 | 12 |
| 3 | 1 | 5, 4, 4, 3.25 | 13 |
| 4 | 2 | 5, 4, 4, 3.25, 3 | 15 |

**8)**

**i)** a = 5, output = 120 **ii)** 2a+3 Operations **iii)** O(n)

|  |  |
| --- | --- |
| **a** | **factorial** |
|  | 1 |
| 1 | 1 |
| 2 | 2 |
| 3 | 6 |
| 4 | 24 |
| 5 | 120 |

**9)**

**i)** a = 5, b = 3, output = 125 **ii)** 2b+3 Operations **iii)** O(n)

|  |  |
| --- | --- |
| **b** | **power** |
|  | 1 |
| 1 | 5 |
| 2 | 25 |
| 3 | 125 |

**10)**

**i)** A = {5,3,4,1,2}, n = 5, q = 1 output = 3 **ii)** 5n+3 Operations **iii)** O(n)

|  |  |  |
| --- | --- | --- |
| **n** | **A[index]** | **index** |
|  |  | 0 |
| 0 | 5 | 0 |
| 1 | 3 | 1 |
| 2 | 4 | 2 |
| 3 | 1 | 3 |
|  | **Stops** | 4 |