**Assessment Task 2**

**Outcome Covered 2**

**Assessment Task Instructions**

**Binary Search Algorithm for Data Stored in Array**

Using the array data set and algorithm below, show the steps involved in performing a binary search searching for the following names.

* Fay
* Ray

**Data Set**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **0** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** | **13** | **14** | **15** |
| Ali | Ann | Bob | Cat | Del | Fay | Ian | Jim | Kim | Mel | Pat | Ray | Sue | Tom | Vic | Zak |

**Algorithm**

Start

int left = 0; //our indices start at 0

int right = numrecords – 1 //last element

while (left <= right)

int pos = (left + right) / 2 //half way through

if (DataSet[pos] == id)

return pos /found so exit

if (DataSet[pos] < id)

left = pos + 1 //need to search right hand side

else

right = pos – 1 //need to search left hand side

end of while loop

return -1 //not found

End

**Assessment Pro-Forma Search**

|  |  |
| --- | --- |
| **Candidate Name** | Robert Lothian |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Name being Searched For** | | | Fay | | | |
|  | **Left** | **Right** | | **Pos** | **Found** | **Comment** |
| **Pre-Loop** | 0 | 15 | |  |  |  |
| **Loop 1** | 0 | 6 | | 7 | No | Jim found 7>5 |
| **Loop 2** | 4 | 6 | | 3 | No | Cat found 3<5 |
| **Loop 3** |  |  | | 5 | Yes | Pos 5 = Fay |
| **Loop 4** |  |  | |  |  |  |
| **Loop 5** |  |  | |  |  |  |
| **Loop 6** |  |  | |  |  |  |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Name being Searched For** | | | Ray | | | |
|  | **Left** | **Right** | | **Pos** | **Found** | **Comment** |
| **Pre-Loop** | 0 | 15 | |  |  |  |
| **Loop 1** | 8 | 15 | | 7 | No | Jim found 7<11 |
| **Loop 2** |  |  | | 11 | Yes | Pos 11 = Ray |
| **Loop 3** |  |  | |  |  |  |
| **Loop 4** |  |  | |  |  |  |
| **Loop 5** |  |  | |  |  |  |
| **Loop 6** |  |  | |  |  |  |