CS401 Lab 7: Binary Search data structure implementation

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Part 1: Binary Search and Sorting

1. Eclipse

```
Sorted Employee List:
[Employee Name: John Smith, ID: 1001]
[Employee Name: Emma Johnson, ID: 1002]
[Employee Name: Michael Brown, ID: 1003]
[Employee Name: Sarah Davis, ID: 1004]
[Employee Name: David Wilson, ID: 1005]
[Employee Name: Jennifer Taylor, ID: 1006]
[Employee Name: Christopher Anderson, ID: 1007]
[Employee Name: Lisa Thomas, ID: 1008]
[Employee Name: Matthew Jackson, ID: 1009]
[Employee Name: Olivia White, ID: 1010]
[Employee Name: Daniel Martinez, ID: 1011]
[Employee Name: Sophia Garcia, ID: 1012]
[Employee Name: James Robinson, ID: 1013]
[Employee Name: Emily Clark, ID: 1014]
[Employee Name: Robert Lewis, ID: 1015]
[Employee Name: Ava Lee, ID: 1016]
[Employee Name: William Walker, ID: 1017]
[Employee Name: Mia Hall, ID: 1018]
[Employee Name: Joseph Allen, ID: 1019]
[Employee Name: Isabella Young, ID: 1020]
[Employee Name: Richard King, ID: 1021]
[Employee Name: Abigail Wright, ID: 1022]
[Employee Name: Thomas Scott, ID: 1023]
[Employee Name: Grace Green, ID: 1024]
[Employee Name: Charles Baker, ID: 1025]
[Employee Name: Chloe Adams, ID: 1026]
[Employee Name: Andrew Nelson, ID: 1027]
[Employee Name: Ella Mitchell, ID: 1028]
[Employee Name: Ryan Carter, ID: 1029]
[Employee Name: Lily Phillips, ID: 1030]

Find Employee ID 1010
Employee found: [Employee Name: Olivia White, ID: 1010]

Find Employee ID 9999
Employee with ID 9999 not found.
```

2. JAR

```
Sorted Employee List:
[Employee Name: John Smith, ID: 1001]
[Employee Name: Emma Johnson, ID: 1002]
[Employee Name: Michael Brown, ID: 1003]
[Employee Name: Sarah Davis, ID: 1004]
[Employee Name: David Wilson, ID: 1005]
[Employee Name: Jennifer Taylor, ID: 1006]
[Employee Name: Christopher Anderson, ID: 1007]
[Employee Name: Lisa Thomas, ID: 1008]
[Employee Name: Matthew Jackson, ID: 1009]
[Employee Name: Olivia White, ID: 1010]
[Employee Name: Daniel Martinez, ID: 1011]
[Employee Name: Sophia Garcia, ID: 1012]
[Employee Name: James Robinson, ID: 1013]
[Employee Name: Emily Clark, ID: 1014]
[Employee Name: Robert Lewis, ID: 1015]
[Employee Name: Ava Lee, ID: 1016]
[Employee Name: William Walker, ID: 1017]
[Employee Name: Mia Hall, ID: 1018]
[Employee Name: Joseph Allen, ID: 1019]
[Employee Name: Isabella Young, ID: 1020]
[Employee Name: Richard King, ID: 1021]
[Employee Name: Abigail Wright, ID: 1022]
[Employee Name: Thomas Scott, ID: 1023]
[Employee Name: Grace Green, ID: 1024]
[Employee Name: Charles Baker, ID: 1025]
[Employee Name: Chloe Adams, ID: 1026]
[Employee Name: Andrew Nelson, ID: 1027]
[Employee Name: Ella Mitchell, ID: 1028]
[Employee Name: Ryan Carter, ID: 1029]
[Employee Name: Lily Phillips, ID: 1030]

Find Employee ID 1010
Employee found: [Employee Name: Olivia White, ID: 1010]

Find Employee ID 9999
Employee with ID 9999 not found.
```

Part 2: Infix to Postfix Conversion and Evaluation

1. Eclipse

```
Infix: 1 + 3 * 8
Postfix: 1 3 8 * +
Evaluation: 25

Infix: 8 - 3 - 4 * 6 + 3
Postfix: 8 3 - 4 6 * - 3 +
Evaluation: -16

Infix: 8 - 2 + 8 / 4 + 6 - 1 - 6 / 2
Postfix: 8 2 - 8 4 / + 6 + 1 - 6 2 / -
Evaluation: 10
```

2. JAR

```
PS C:\Users\qube2\OneDrive - Illinois Institute of Technology\Documents\Fall 24\CS_401\1030\CS401-lab06_Seonghwan-Lim> java -jar InfixPostfixEvaluator.jar
Infix: 1 + 3 * 8
Postfix: 1 3 8 * +
Evaluation: 25

Infix: 8 - 3 - 4 * 6 + 3
Postfix: 8 3 - 4 6 * - 3 +
Evaluation: -16

Infix: 8 - 2 + 8 / 4 + 6 - 1 - 6 / 2
Postfix: 8 2 - 8 4 / + 6 + 1 - 6 2 / -
Evaluation: 10
```

Part 3: Palindrome Checker

1. Eclipse

```
Enter a string: racecar
"racecar" is a palindrome.

Enter a string: hello
"hello" is not a palindrome.
```

2. JAR

```
PS C:\Users\qube2\OneDrive - Illinois Institute of Technology\Documents\Fall 24\CS_401\1030\CS401-lab06_Seonghwan-Lim> java -jar PalindromeChecker.jar
Enter a string: racecar
"racecar" is a palindrome.

Enter a string: hello
"hello" is not a palindrome.
```