

Zaawansowane struktury danych - Drzewo Czerwono-Czarne

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Drzewo Czerwono-Czarne - funkcje i procedury

STRUCT-TREE

 root = NIL

STRUCT-NODE

 key = 0

 color = RED

 p = NIL

 left = NIL

 right = NIL

TREE-SEARCH-RECURSIVE(T, k)

TREE-SEARCH-ITERATIVE(T, k)

TREE-SUCCESSOR(T, x)

TREE-PREDECESSOR(T, x)

TREE-WRITE(T)

TREE-INSERT(T, k)

TREE-DELETE(T, k)

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```
STRUCT-TREE T  
TREE-INSERT(T, 11)  
TREE-INSERT(T, 2)  
TREE-INSERT(T, 14)  
TREE-INSERT(T, 1)  
TREE-INSERT(T, 15)  
TREE-INSERT(T, 6)  
TREE-INSERT(T, 5)  
TREE-INSERT(T, 8)
```

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```
WRITE(T)
// 15*
// 14
//11
// 8*
// 6
// 5*
// 2*
// 1
```

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```
WRITE(TREE-SEARCH-RECURSIVE(T, 5)) //5  
WRITE(TREE-SEARCH-ITERATIVE(T, 5)) //5  
WRITE(TREE-SUCCESSOR(TREE-SEARCH-RECURSIVE(T, 6))) //8  
WRITE(TREE-SUCCESSOR(TREE-SEARCH-RECURSIVE(T, 8))) //11  
WRITE(TREE-PREDECESSOR(TREE-SEARCH-RECURSIVE(T, 6)))  
//5  
WRITE(TREE-PREDECESSOR(TREE-SEARCH-RECURSIVE(T, 14)))  
//11
```

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```
TREE-INSERT(T,4)
WRITE(T)
// 15*
// 14
// 11*
// 8
//6
// 5
// 4*
// 2*
// 1
```

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```
TREE-INSERT(T,13)
TREE-INSERT(T,12)
WRITE(T)
// 15
// 14*
// 13
// 12*
// 11
// 8
//6
// 5
// 4*
// 2
// 1
```

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```
TREE-DELETE(T,8)
WRITE(T)
// 15
// 14
// 13
// 12*
// 11
//6
// 5
// 4*
// 2
// 1
```

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```
TREE-DELETE(T, 12)
WRITE(T)
// 15
// 14
// 13
// 11*
//6
// 5
// 4*
// 2
// 1
```