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1 package radixtree
2
3 private final case class Edges(nodes: IndexedSeq[Node
  ]) extends WordSet:
4   def isEmpty: Boolean = nodes.isEmpty
5   def nonEmpty: Boolean = !isEmpty
6   def size: Int = nodes.foldLeft(0)(_ + _.size)
7   def depth: Int =
8     if nodes.isEmpty then 0
9     else nodes.map(_.depth).max
10  def width: Int =
11    if nodes.isEmpty then 0
12    else math.max(nodes.length, nodes.map(_.width).max)
13
14  def + (word: String): Edges =
15    if word.isEmpty then
16      val emptyRoot = Node("", Edges(nodes), isWord =
17      true)
18      Edges(IndexedSeq(emptyRoot))
19    else
20      val first = word.head
21      val idx = nodes.indexWhere(_.str.head == first)
22      if idx < 0 then
23        Edges(nodes :+ Node(word, Edges(Vector()),
24        isWord = true))
25      else
26        val updated = nodes(idx) + (word)
27        Edges(nodes.updated(idx, updated))
28
29  def - (word: String): Edges =
30    if nodes.isEmpty then this
31    else
32      val first = word.headOption
33      first match
34        case None =>
35          if nodes.nonEmpty && nodes.head.str.isEmpty
36          then
37            Edges(nodes.head.edges.nodes)

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35         else this
36
37         case Some(c) =>
38             val idx = nodes.indexWhere(_.str.head == c)
39             if idx < 0 then this
40             else
41                 val updated = nodes(idx) - word
42                 if updated == null then
43                     Edges(nodes.patch(idx, Nil, 1))
44                 else
45                     Edges(nodes.updated(idx, updated))
46
47     def complete(prefix: String): Edges =
48         prefix.headOption match
49             case None => this
50             case Some(c) =>
51                 nodes.find(_.str.head == c) match
52                     case None => Edges(Vector())
53                     case Some(n) => n.complete(prefix)
54
55     def search(word: String): Int =
56         word.headOption match
57             case None =>
58                 if nodes.nonEmpty && nodes.head.str.isEmpty
59 then 1 else -1
60             case Some(c) =>
61                 nodes.find(_.str.head == c) match
62                     case None => -1
63                     case Some(n) => n.search(word)
64
65     def contains(word: String): Boolean =
66         search(word) == 1
67
68     def find(test: String => Boolean): Option[String] =
69         findHelper("", test)
70
71     def exists(test: String => Boolean): Boolean =
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72     find(test).nonEmpty
73     def forall(test: String => Boolean): Boolean =
74         !exists(s => !test(s))
75     def foreach[U](f: String => U): Unit =
76         foreachHelper("", f)
77     def fold[A](start: A)(f: (A, String) => A): A =
78         foldHelper(start, "", f)
79
80     def allWords: Seq[String] =
81         val buf = collection.mutable.ListBuffer[String]()
82         nodes.foreach(_.allWords("", buf))
83         buf.toList
84
85     def allStrings: Seq[(String, Boolean)] =
86         nodes.flatMap(_.dumpStrings)
87
88     def toString(separator: String): String =
89         val sb = new StringBuilder
90         nodes.foreach(_.toString(0, sb, separator))
91         if sb.nonEmpty then sb.result()
92         else ""
93
94     // add methods if needed
95     private def foreachHelper[U](prefix: String, f:
String => U): Unit =
96         nodes.foreach(_.foreach(prefix, f))
97
98     private def foldHelper[A](acc: A, prefix: String, f
: (A, String) => A): A =
99         nodes.foldLeft(acc)((a, n) => n.fold(a, prefix, f
))
100
101     private def findHelper(prefix: String, test: String
=> Boolean): Option[String] =
102         nodes.foldLeft(Option.empty[String]) { (acc, node
) =>
103             acc match
104                 case some@Some(_) =>

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105         some
106         case None =>
107             node.find(prefix, test)
108     }
109 end Edges
110
111 private object Edges:
112     val empty: Edges = Edges.of()
113     def of(nodes: Node*): Edges = new Edges(nodes.
        toVector)
114     // add methods if needed
115 end Edges
116
```