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1 package radixtree
2
3 private final case class Edges(nodes: IndexedSeq[Node]
4 ) extends WordSet:
5     def isEmpty: Boolean = nodes.isEmpty
6     def nonEmpty: Boolean = !isEmpty
7     def size: Int = nodes.foldLeft(0)(_ + _.size)
8     def depth: Int =
9         if nodes.isEmpty then 0
10        else nodes.map(_.depth).max
11    def width: Int =
12        if nodes.isEmpty then 0
13        else math.max(nodes.length, nodes.map(_.width).max)
14
15    def + (word: String): Edges =
16        if word.isEmpty then
17            val emptyRoot = Node("", Edges(nodes), isWord =
18                true)
19            Edges(IndexedSeq(emptyRoot))
20        else
21            val first = word.head
22            val idx = nodes.indexWhere(_.str.head == first)
23            if idx < 0 then
24                Edges(nodes :+ Node(word, Edges(Vector()), isWord =
25                    true))
26            else
27                val updated = nodes(idx) + (word)
28                Edges(nodes.updated(idx, updated))
29
30    def - (word: String): Edges =
31        if nodes.isEmpty then this
32        else
33            val first = word.headOption
34            first match
35                case None =>
36                    if nodes.nonEmpty && nodes.head.str.isEmpty
37                    then
38                        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:
96      String => U): Unit =
97      nodes.foreach(_.foreach(prefix, f))
98
99  private def foldHelper[A](acc: A, prefix: String, f
100     : (A, String) => A): A =
101      nodes.foldLeft(acc)((a, n) => n.fold(a, prefix, f
102 )) )
103
104  private def findHelper(prefix: String, test: String
105     => Boolean): Option[String] =
106      nodes.foldLeft(Option.empty[String]) { (acc, node
107 ) =>
108          acc match
109              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.
114         toVector)
114     // add methods if needed
115 end Edges
116
```