

```

class EulerTour {
  visitExternal(T, p, r) { }
  visitPreOrder(T, p, r) { }
  visitInOrder(T, p, r) { }
  visitPostOrder(T, p, r) { }
  eulerTour(T, p) {
    let r = new Array(3);
    if (T.isExternal(p)) { this.visitExternal(T, p, r); }
    else { // internal node
      this.visitPreOrder(T, p, r);
      r[0] = this.eulerTour(T, T.leftChild(p));
      this.visitInOrder(T, p, r);
      r[2] = eulerTour(T, T.rightChild(p));
      this.visitPostOrder(T, p, r);
    }
    return r[1];
  }
}

class Sum extends EulerTour {
  visitExternal(T, p, r) {
    r[1] = 0;
  }
  visitPostorder(T, p, r) {
    r[1] = r[0] + r[2] + p.element();
  }
  sum(T) {
    return eulerTour(T, T.root());
  }
}

function sumHelper(T, p) {
  if T.isExternal(p) then
    return 0 // action visitExternal
  else
    lsum <- sumHelper(T, T.leftChild(p))
    rsum <- sumHelper(T, T.rightChild(p))
    return lsum + rsum + p.element() // action visitPostorder
}

```

