Chapter 2: Program Flow (Solutions)

Solution for Task 9:

 public void act() {

 if (treeFront()) {

 goAroundTree();

 } else {

 move();

 }

 if (onLeaf()) {

 removeLeaf();

 stop();

 }

 }

 public void goAroundTree() {

 turnLeft();

 move();

 turnRight();

 move();

 move();

 turnRight();

 move();

 turnLeft();

 }

Solution for Task 11:

 public void act() {

 if (treeLeft()) {

 move();

 } else {

 if (onLeaf()) {

 removeLeaf();

 move();

 } else {

 move();

 }

 }

 }

Solution for Task 12:

 public void act() {

 if (treeLeft() && treeRight()) {

 putLeaf();

 stop();

 } else {

 move();

 }

 }

Solution for Task 13:

 public void act() {

 if (treeLeft() || treeRight()) {

 putLeaf();

 move();

 } else {

 move();

 }

 if (onLeaf()) {

 stop();

 }

 }

Solution for Task 14:

 public void act() {

 if (!onLeaf()) {

 putLeaf();

 }

 if (!treeFront()) {

 move();

 } else {

 stop();

 }

 }

Solution for Task 15:

 public void act() {

 if (onLeaf()) {

 removeLeaf();

 } else {

 if (!treeFront()) {

 move();

 } else {

 if (!treeLeft()) {

 turnLeft();

 move();

 } else {

 turnRight();

 move();

 }

 }

 }

 }

Solution for Task 16:

 public void act() {

 if (!treeFront()) {

 removeLeaf();

 findNextLeaf();

 } else {

 removeLeaf();

 stop();

 }

 }

 public void findNextLeaf() {

 // look for leaf in front

 // (erst mal vorne schauen)

 move();

 if (!onLeaf()) {

 // no leaf in front, go back and look left

 // (kein Blatt vorne, also zurueck und links schauen)

 turnAndGoBack();

 turnRight();

 move();

 if (!onLeaf()) {

 // no leaf left; leaf must be on right side

 // (links ist auch kein Blatt; dann muss es rechts liegen)

 turnAndGoBack();

 move();

 }

 }

 }

 public void turnAndGoBack() {

 turnLeft();

 turnLeft();

 move();

 }

Solution for Task 18:

 public void act() {

 while (!onLeaf()) {

 if (treeFront()) {

 goAroundTree();

 } else {

 move();

 }

 }

 // Found leaf --> eat it

 removeLeaf();

 stop();

 }

 public void goAroundTree() {

 turnLeft();

 move();

 turnRight();

 move();

 while (treeRight()) {

 move();

 }

 turnRight();

 move();

 turnLeft();

 }

Solution for Task 19:

 public void act() {

 while (treeFront()) {

 oneStepUp();

 }

 stop();

 }

 public void oneStepUp() {

 turnLeft();

 move();

 turnRight();

 move();

 }

Solution for Task 20:

 public void act() {

 makeOneStep();

 }

 public void makeOneStep() {

 if (!treeRight()) {

 // no tree right --> go right

 turnRight();

 move();

 } else {

 // there is a tree right

 if (!treeFront()) {

 // no tree in front --> move

 move();

 } else {

 // trees right and front

 if (!treeLeft()) {

 // no tree left --> go left

 turnLeft();

 move();

 } else {

 // trees right, front and left: dead end

 turnLeft();

 turnLeft();

 move();

 }

 }

 }

 }