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 {

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();

}

}

}

}