case11.asp

P	H	R
S	H	S
	H	P

One order to fill, products spread across 2 shelves with a highway splitting the grid.

case12.asp

S	H	H
H	P	H
HR	H	S

One order to fill, products spread across 2 shelves, and the robot will have to return its shelf back to where it was picked up due to highways

case13.asp

R	R	R
S	S	S
P	P	P

Three robots, shelves and pickingStations, however the the orders are not filled at the station directly ahead of each robot. Robots will have to maneuver around each other.

case14.asp

R	S	S
S	P	S
S	S	

One robot and pickingStation, and six shelves. The shelves with product are tucked away and will require the robot move other shelves first before filling the order.

case15.asp

P	P	P
P	S	P
P	R	P

One robot, shelf and seven pickingStations. The robot must take its single shelf on a journey to fill seven orders, dropping off a little product at each.

case16.asp

		R
S	P	S
R		

Two robots, shelves and orders, with two orders at a single picking station. However the robots cannot fill the order at the same time and so one robot must wait.

case17.asp

R	S	R
S	P	S
R	S	R

Extension of case16, where four robots must wait their turn to fill orders at a single picking station.

case18.asp

R	S	P
P	R	S
P	S	R

Short test case with three robots, shelves, stations and orders. Should require few actions to fill.

case19.asp

R	S	S
S	P	S
S		P

One robot must fill two orders at two stations, but both order's products are split across 2-3 shelves. The is not a significant amount of room, and so shelf placement must be thought out.

case20.asp

P	H	H
S	S	H
R	S	H

One robot must fill two orders at two stations, but both order's products are split across 2-3 shelves. The is not a significant amount of room, and so shelf placement must be thought out.

case21_4x4.asp

P	S	R	S
H	S	H	S
H	S	H	S
H	H	H	P

A larger grid, but the robot's shelf is next to it at the start. Traveling along the highway will allow it to fill both orders using its single product

case22_4x4.asp

R	S	S	R
S	P	P	S
S	P	P	S
R	S	S	R

A larger grid, with robots in all four corners. Each robot has two shelves to deliver to the closest picking station.

case23_4x4.asp

R	S	S	R
S	P	P	S
S	P	P	S
R	S	S	R

A larger grid, with robots in all four corners. Each robot has two shelves to deliver, however the picking stations were rotated so that a greater amount of coordination is required for each robot to have an opportunity to deliver to its appropriate station.

Summary of Test Cases

case11.asp
One order to fill, products spread across 2 shelves with a highway splitting the grid.

case12.asp
One order to fill, products spread across 2 shelves, and the robot will have to return its shelf back to where it was picked up due to highways

case13.asp
Three robots, shelves and pickingStations, however the the orders are not filled at the station directly ahead of each robot. Robots will have to maneuver around each other.

case14.asp
One robot and pickingStation, and six shelves. The shelves with product are tucked away and will require the robot move other shelves first before filling the order.

case15.asp
One robot, shelf and seven pickingStations. The robot must take its single shelf on a journey to fill seven orders, dropping off a little product at each.

case16.asp
Two robots, shelves and orders, with two orders at a single picking station. However the robots cannot fill the order at the same time and so one robot must wait.

case17.asp
Extension of case16, where four robots must wait their turn to fill orders at a single picking station.

case18.asp
Short test case with three robots, shelves, stations and orders. Should require few actions to fill.

case19.asp
One robot must fill two orders at two stations, but both order's products are split across 2-3 shelves. The is not a significant amount of room, and so shelf placement must be thought out.

case20.asp
One robot, three shelves and one order and pickingStation. Robot must travel along the outside of the grid to deliver a single order.

case21_4x4.asp
A larger grid, but the robot's shelf is next to it at the start. Traveling along the highway will allow it to fill both orders using its single product

case22_4x4.asp
A larger grid, with robots in all four corners. Each robot has two shelves to deliver to the closest picking station.

case23_4x4.asp
A larger grid, with robots in all four corners. Each robot has two shelves to deliver, however the picking stations were rotated so that a greater amount of coordination is required for each robot to have an opportunity to deliver to its appropriate station.