Q1:

footpath(52,53).

footpath(52,0).

footpath(53,54).

footpath(56,57).

footpath(56,58).

footpath(57,58).

footpath(57,1).

footpath(57,59).

footpath(58,59).

footpath(59,60).

footpath(83,65).

footpath(65,68).

footpath(76,69).

motorway(0,62).

motorway(53,62).

motorway(54,56).

motorway(54,62).

motorway(1,62).

motorway(59,60).

motorway(59,68).

motorway(59,83).

motorway(83,62).

motorway(68,66).

motorway(68,62).

motorway(68,63).

motorway(68,76).

motorway(68,64).

motorway(66,63).

motorway(66,69).

motorway(66,76).

motorway(66,64).

motorway(63,62).

motorway(63,64).

motorway(63,76).

motorway(63,69).

motorway(64,69).

motorway(64,76).

motorway(0,59).

motorway(0,60).

motorway(0,68).

motorway(0,83).

motorway(1,54).

routeFoot(A,B) :-

footpath(B,A);

footpath(A,B).

routeMotor(A,B) :-

motorway(A,B);

motorway(B,A).

routeMixed(A,Connector,B):-

footpath(A,Connector);

motorway(Connector,B);

footpath(Connector,A);

motorway(Connector,B).

dfs\_startFoot(InititalState, Goal, Es, Solution) :-

dfs([InititalState], [], Es, Goal, Solution).

dfs([H|\_], Es0, Es, Goal, H) :- call(Goal, H), reverse(Es0, Es).

dfs([H|T], Es0, Es, Goal, Solution):-

findall(X, (footpath(H, X),

\+ member(X, Es0),

\+ member(X, [H|T]) ), Children),

append(Children, T, OpenList),

dfs(OpenList, [H|Es0], Es, Goal, Solution).