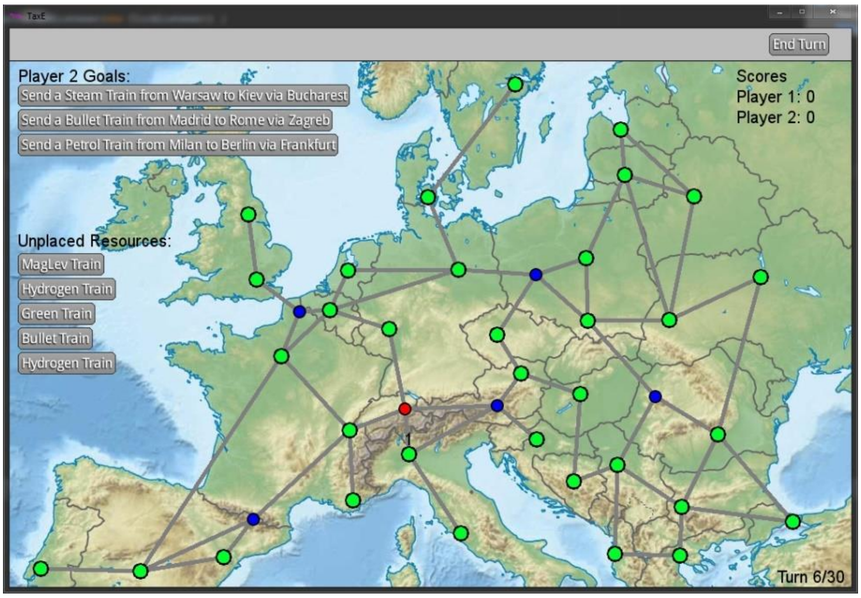
TEST CASE REPORT

Interface Tests

Id: I1
Description: test of junction failure - does the junction failure prevent a train from travelling along that route
Related Requirements: SR 5e
Category: Interface Testing
Status: Pass/Fail - The test passed in that if a junction has failed, you may not select a route including that junction. However it also failed in that if you've already selected a route, and then the junction fails as you're travelling along the route, the junction failure does not stop the train from travelling via the junction.

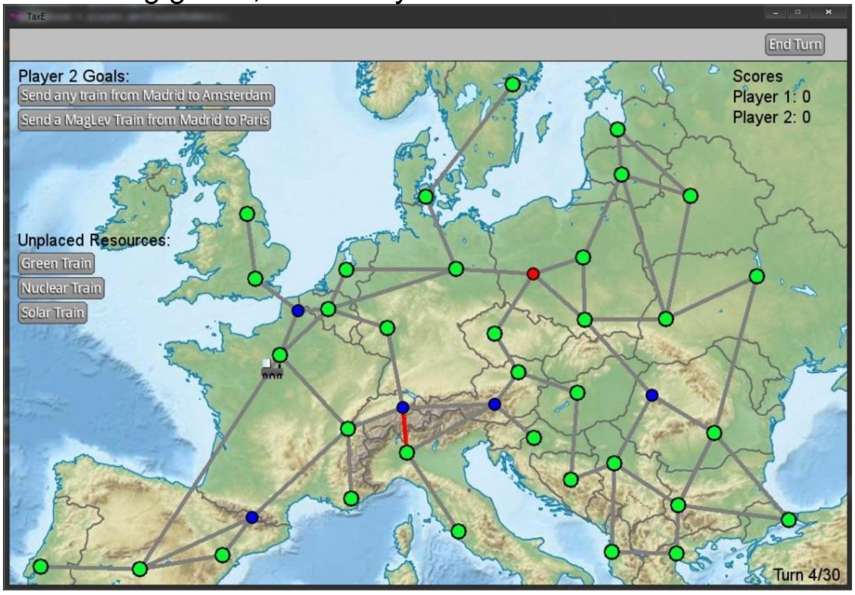
Id: I2
Description: retest of junction failure - does the junction failure prevent a train from travelling along that route
Related Requirements: SR 5e
Category: Interface Testing, Regression Testing
Status: Pass - The changes made to the script have fixed the previously reported problem.


TaxE
End Turn
Player 2 Goals:
Send a Steam Train from Warsaw to Kiev via Bucharest
Send a Bullet Train from Madrid to Rome via Zagreb
Send a Petrol Train from Milan to Berlin via Frankfurt
Unplaced Resources:
MagLev Train
Hydrogen Train
Green Train
Bullet Train
Hydrogen Train
Scores
Player 1: 0
Player 2: 0
1
Turn 6/30

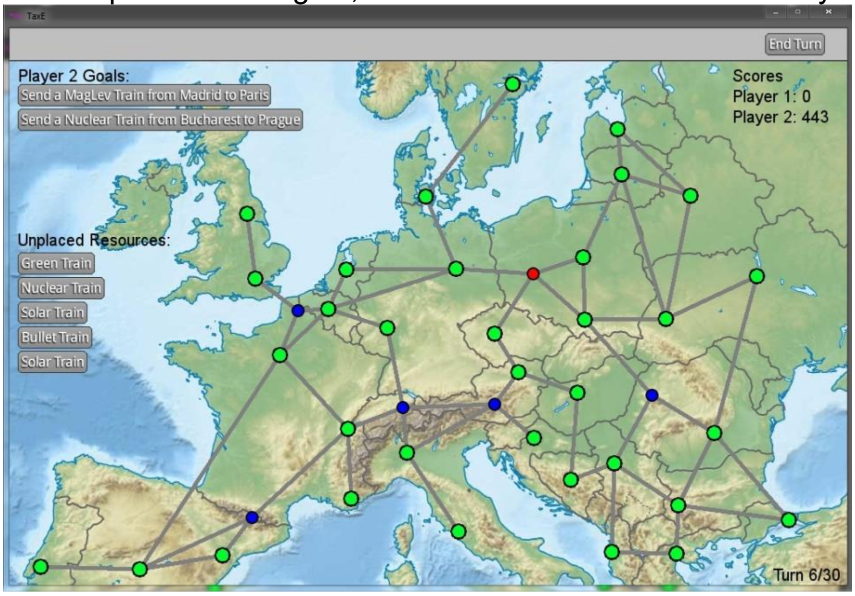
The number 1 at the station next to the junction failure indicates where the train has stopped; the user can now make a new route for their train

Id: I3
Description: test the scoring mechanism for an easy goal for the completion of said goal
Related Requirements: SR 3a and SR 3b and SR 3c and SR 4b
Category: Interface Testing
Status: Pass

Undertaking goal 1, “Send any train from Madrid to Amsterdam”



Upon completion of the goal, the score “443” is awarded to Player 2

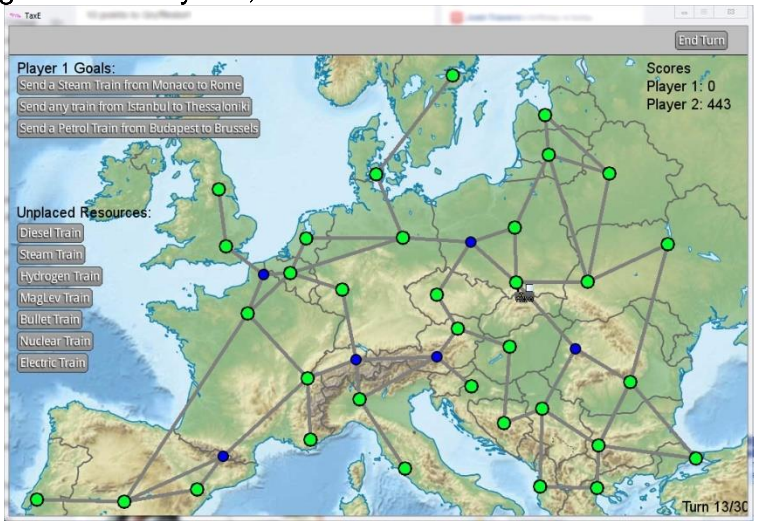


Id: I4
Description: test the scoring mechanism for a medium goal for the completion of one goal, using the incorrect train - this should give a score of 0
Related Requirements: SR 3a and SR 3b and SR 3c and SR 4b
Category: Interface Testing
Status: Pass

Id: I5
Description: test the scoring mechanism for a medium goal for the completion of one goal, using the correct train
Related Requirements: SR 3a and SR 3b and SR 3c and SR 4b
Category: Interface Testing
Status: Fail - the system doesn’t recognise that the correct train type has been used.

Id: I6
Description: retest the scoring mechanism for a medium goal for the completion of one goal, using the correct train
Related Requirements: SR 3a and SR 3b and SR 3c and SR 4b
Category: Interface Testing, Regression Testing
Status: Pass - the equality between train names was modified and the system now recognises if the correct train type has been used

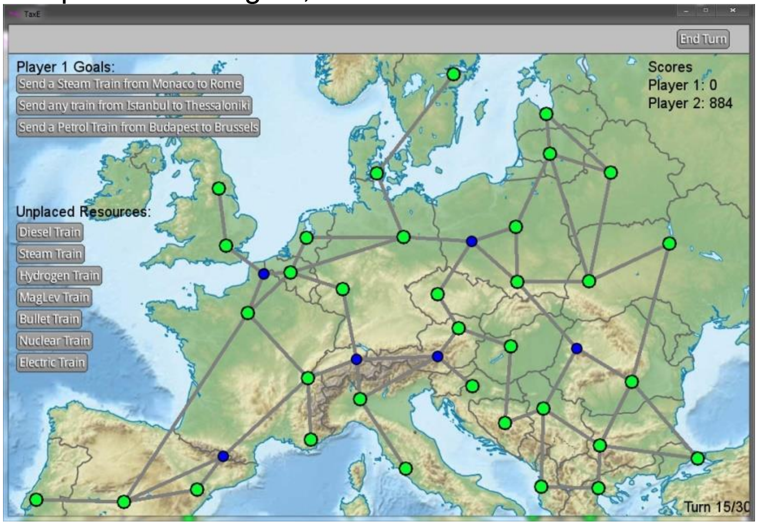
Undertaking goal 2 for Player 2, “Send a Nuclear Train from Bucharest to Prague”



Scores
Player 1: 0
Player 2: 443

Turn 13/30

Upon completion of the goal, the score “441” is awarded to Player 2



Scores
Player 1: 0
Player 2: 884

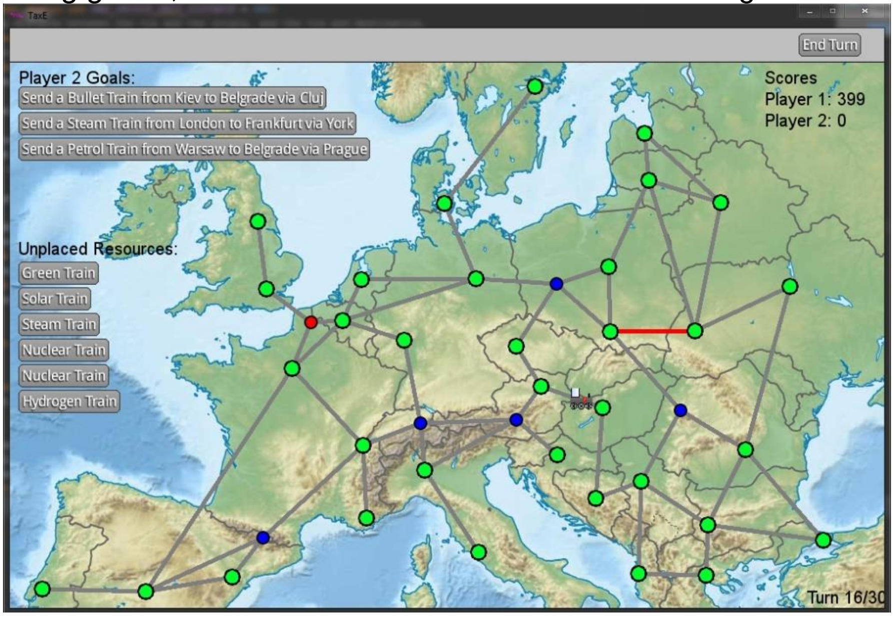
Turn 15/30

Id: I7
Description: test the scoring mechanism for a difficult goal for the completion of one goal, not travelling via the specified station - this should give a score of 0
Related Requirements: SR 3a and SR 3b and SR 3c and SR 4b
Category: Interface Testing
Status: Pass

Id: I8
Description: test the scoring mechanism for a difficult goal for the completion of one goal, travelling via the specified station
Related Requirements: SR 3a and SR 3b and SR 3c and SR 4b
Category: Interface Testing
Status: Fail - The scoring mechanism does not recognise that the goal has been completed.

Id: I9
Description: retest the scoring mechanism for a difficult goal for the completion of one goal, travelling via the specified station
Related Requirements: SR 3a and SR 3b and SR 3c and SR 4b
Category: Interface Testing, Regression Testing
Status: Pass

Undertaking goal 1, “Send a Petrol Train from Warsaw to Belgrade via Prague”



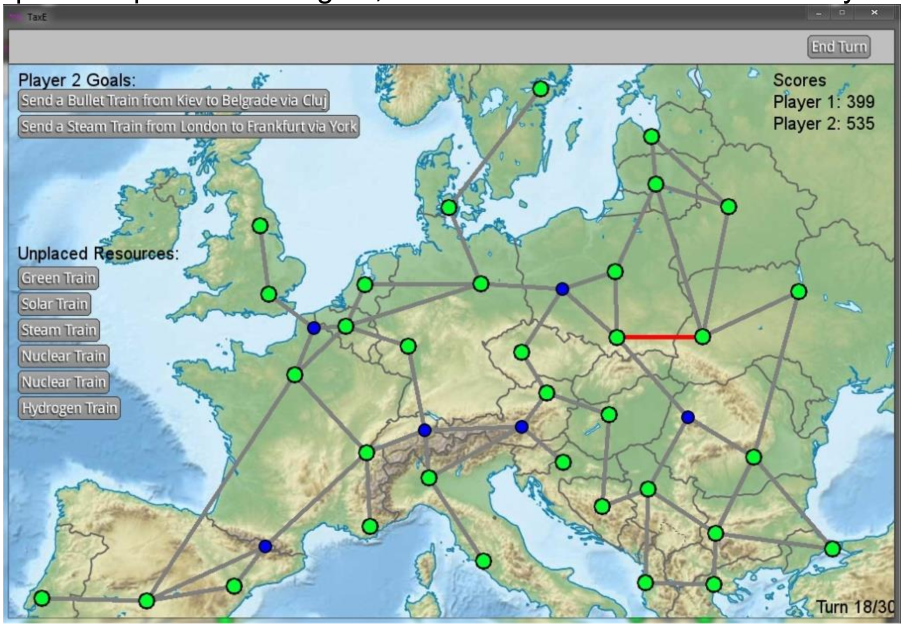
Player 2 Goals:
Send a Bullet Train from Kiev to Belgrade via Cluj
Send a Steam Train from London to Frankfurt via York
Send a Petrol Train from Warsaw to Belgrade via Prague

Unplaced Resources:
Green Train
Solar Train
Steam Train
Nuclear Train
Nuclear Train
Hydrogen Train

Scores
Player 1: 399
Player 2: 0

Turn 16/30

Upon completion of the goal, the score “535” is awarded to Player 2



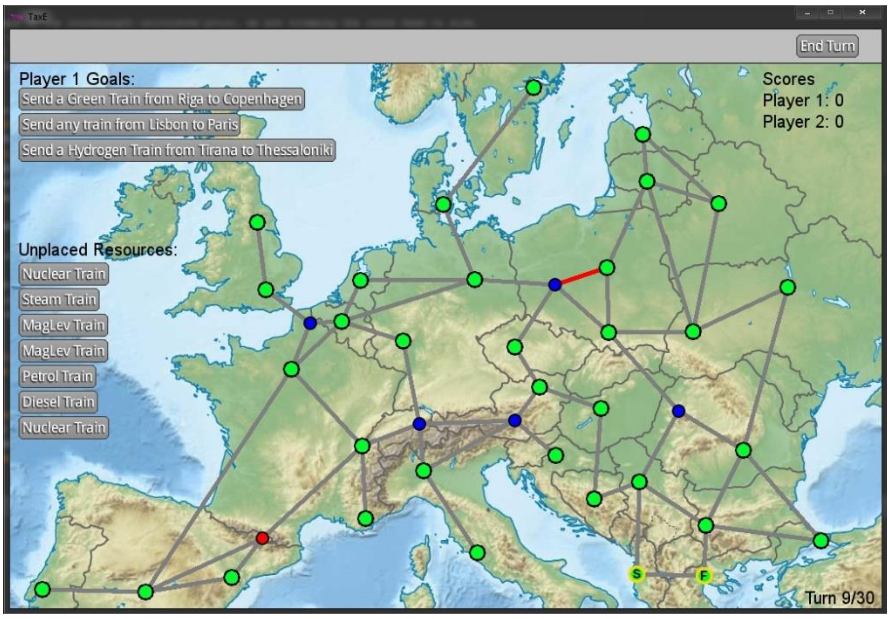
Player 2 Goals:
Send a Bullet Train from Kiev to Belgrade via Cluj
Send a Steam Train from London to Frankfurt via York

Unplaced Resources:
Green Train
Solar Train
Steam Train
Nuclear Train
Nuclear Train
Hydrogen Train

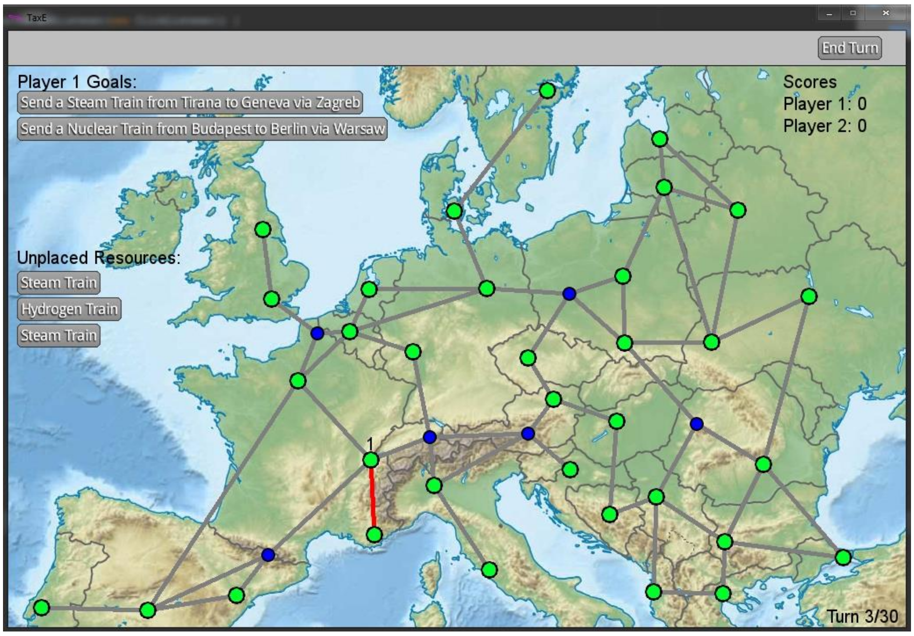
Scores
Player 1: 399
Player 2: 535

Turn 18/30

Id: I10
Description: test that the GUI indicates where there is a hazard on the tracks.
Related Requirements: SR 4c
Category: Interface Testing
Status: Pass – hazards are indicated in red on the GUI, this counts for broken tracks and junction failures.

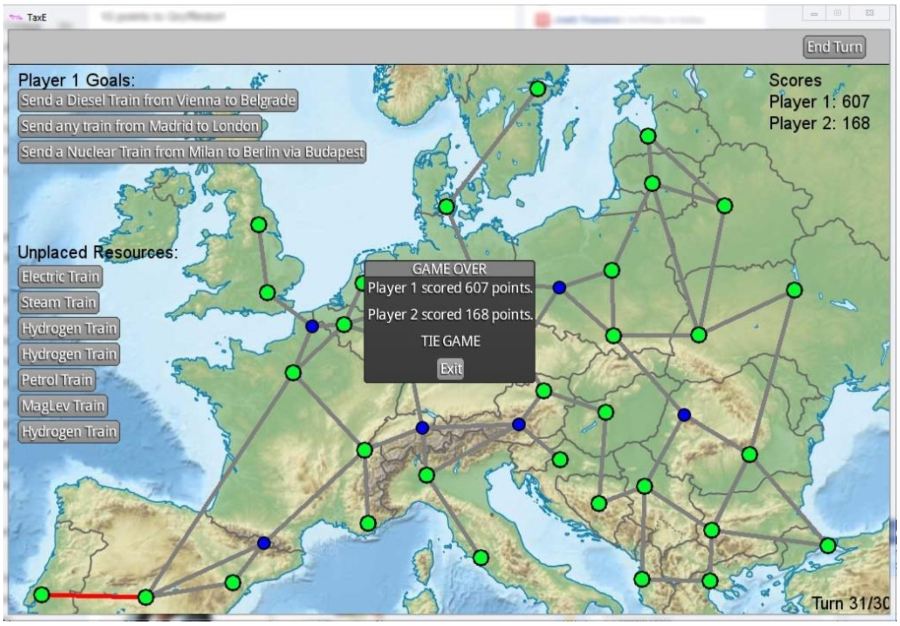


Id: I11
Description: test that when there is a broken track hazard on an already selected route, the player can reroute their train.
Related Requirements: SR 6b
Category: Interface Testing
Status: Pass – the train will stop upon reaching the hazard and then the player may make a new route.



The number 1 at the station above the broken track indicates where the train has stopped; the user can now make a new route for their train

Id: I12
Description: test whether the game indicates the winner at the end of the game depending upon their score
Related Requirements: SR 3d
Category: Interface Testing
Status: Fail – the game indicated that there was a Tie



End Turn

Player 1 Goals:
Send a Diesel Train from Vienna to Belgrade
Send any train from Madrid to London
Send a Nuclear Train from Milan to Berlin via Budapest

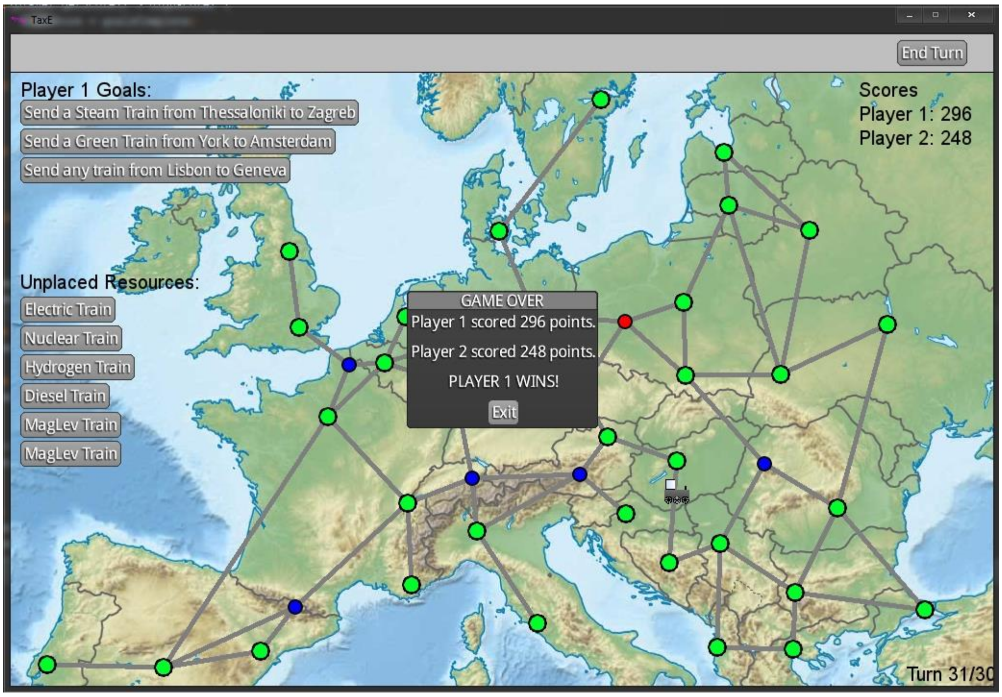
Unplaced Resources:
Electric Train
Steam Train
Hydrogen Train
Hydrogen Train
Petrol Train
MagLev Train
Hydrogen Train

Scores
Player 1: 607
Player 2: 168

GAME OVER
Player 1 scored 607 points.
Player 2 scored 168 points.
TIE GAME
Exit

Turn 31/30

Id: I13
Description: retest whether the game indicates the winner at the end of the game depending upon their score
Related Requirements: SR 3d
Category: Interface Testing, Regression Testing
Status: Pass



End Turn

Player 1 Goals:
Send a Steam Train from Thessaloniki to Zagreb
Send a Green Train from York to Amsterdam
Send any train from Lisbon to Geneva

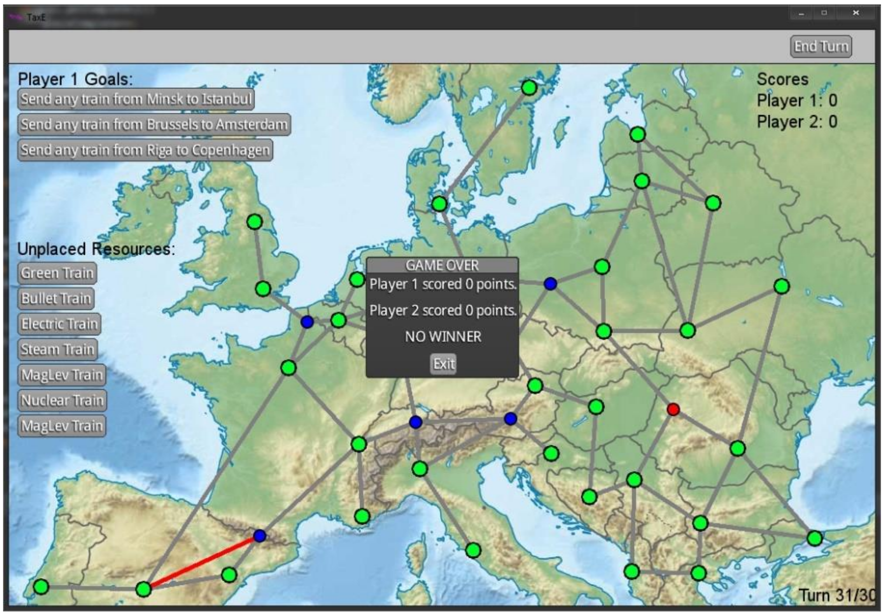
Unplaced Resources:
Electric Train
Nuclear Train
Hydrogen Train
Diesel Train
MagLev Train
MagLev Train

Scores
Player 1: 296
Player 2: 248

GAME OVER
Player 1 scored 296 points.
Player 2 scored 248 points.
PLAYER 1 WINS!
Exit

Turn 31/30

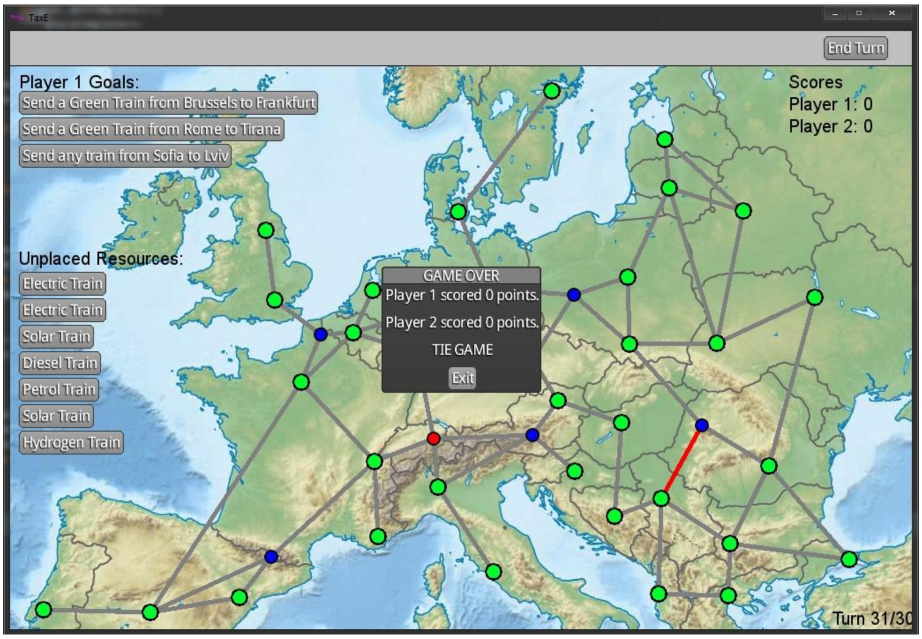
Id: I14
Description: test whether the game indicates that there is a draw if both players end with the same score
Related Requirements: SR 3g
Category: Interface Testing
Status: Fail – the game indicated that there was no winner in this case.


Player 1 Goals:
Send any train from Minsk to Istanbul
Send any train from Brussels to Amsterdam
Send any train from Riga to Copenhagen

Scores
Player 1: 0
Player 2: 0

GAME OVER
Player 1 scored 0 points.
Player 2 scored 0 points.
NO WINNER

Id: I15
Description: retest whether the game indicates that there is a draw if both players end with the same score
Related Requirements: SR 3g
Category: Interface Testing, Regression Testing
Status: Pass – the game now indicates that there has been a tie.

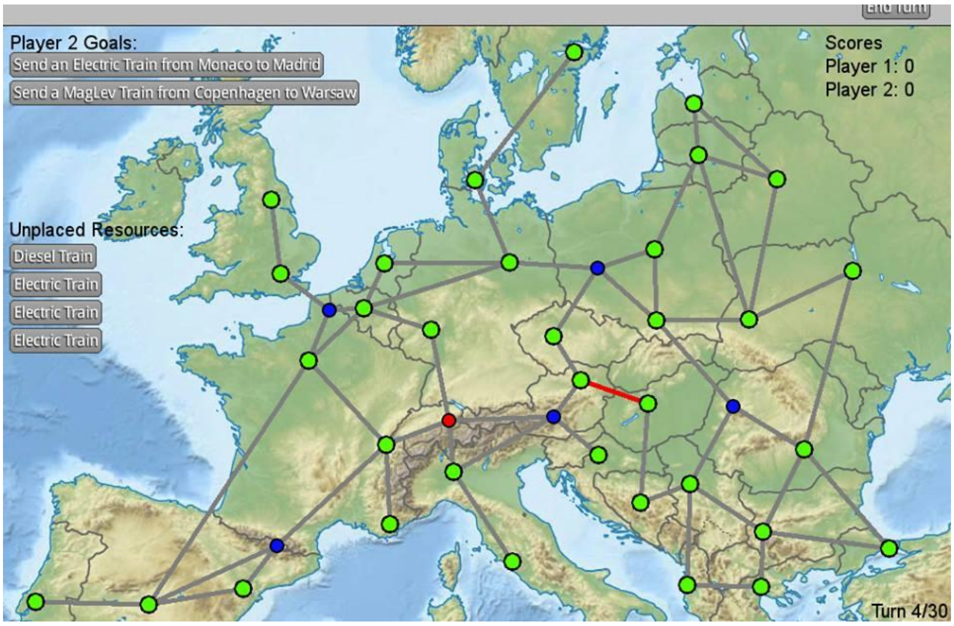

Player 1 Goals:
Send a Green Train from Brussels to Frankfurt
Send a Green Train from Rome to Tirana
Send any train from Sofia to Lviv

Scores
Player 1: 0
Player 2: 0

GAME OVER
Player 1 scored 0 points.
Player 2 scored 0 points.
TIE GAME

Id: I16
Description: test whether the Vowel Class works
Category: Interface Testing
Related Requirements: -
Status: Pass

The vowel classes application of “an” and “a” in goal specifications are shown below



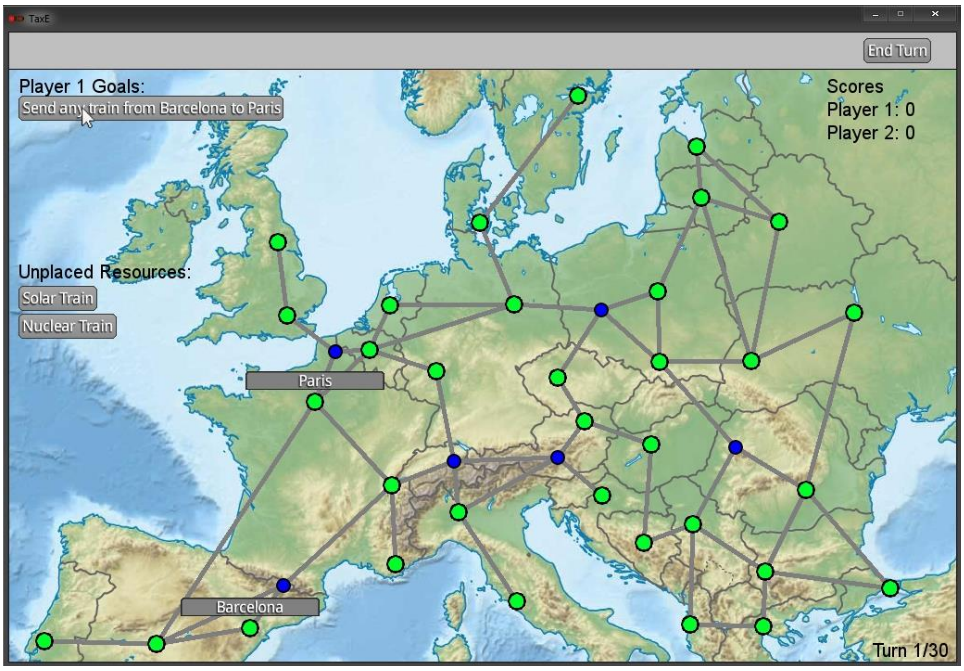
Player 2 Goals:

Send an Electric Train from Monaco to Madrid

Send a MagLev Train from Copenhagen to Warsaw

Id: I17
Description: test whether the start and end stations of goals are displayed using tooltips when hovering over the goal
Category: Interface Testing
Related Requirements: -
Status: Pass

Stations tooltips for goal “Send any train from Barcelona to Paris”

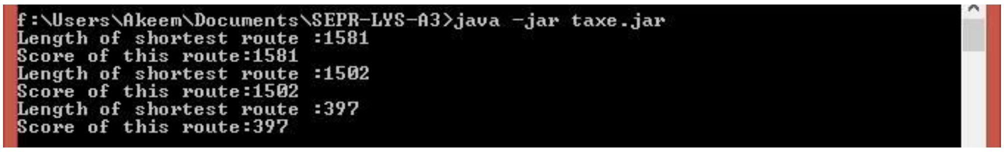


Player 1 Goals:

Send any train from Barcelona to Paris

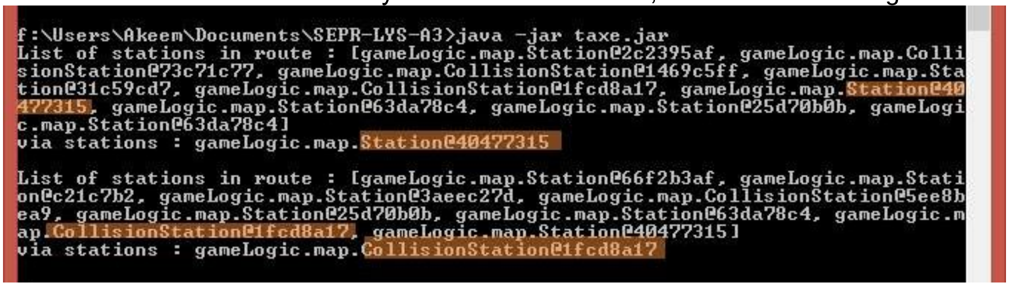
Id: I18
Description: test whether the path finding features work as expected
Category: Interface Testing
Related Requirements: -
Status: Pass

This shows that the score for a goal always correlates with the length of the route



```
f:\Users\Akeem\Documents\SEPR-LYS-A3>java -jar taxe.jar
Length of shortest route :1581
Score of this route:1581
Length of shortest route :1502
Score of this route:1502
Length of shortest route :397
Score of this route:397
```

This shows that the 'via' station is always in the shortest route, but is never the origin or destination



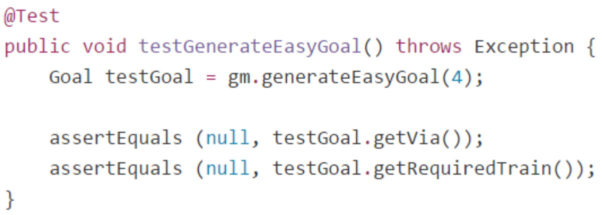
```
f:\Users\Akeem\Documents\SEPR-LYS-A3>java -jar taxe.jar
List of stations in route : [gameLogic.map.Station@2c2395af, gameLogic.map.Colli
sionStation@73c71c77, gameLogic.map.CollisionStation@1469c5ff, gameLogic.map.Sta
tion@31c59cd7, gameLogic.map.CollisionStation@1fcd8a17, gameLogic.map.Station@40
477315, gameLogic.map.Station@63da78c4, gameLogic.map.Station@25d70b0b, gameLogi
c.map.Station@63da78c4]
via stations : gameLogic.map.Station@40477315

List of stations in route : [gameLogic.map.Station@66f2b3af, gameLogic.map.Stati
on@c21c7b2, gameLogic.map.Station@3aeec27d, gameLogic.map.CollisionStation@5ee8b
ea9, gameLogic.map.Station@25d70b0b, gameLogic.map.Station@63da78c4, gameLogic.m
ap.CollisionStation@1fcd8a17, gameLogic.map.Station@40477315]
via stations : gameLogic.map.CollisionStation@1fcd8a17
```

Unit/Component Tests

Id: U1
Description: test that easy goals don't ask for a specific train or a specific 'via' station.
Related Requirements: SR 3c
Category: Unit/Component Testing
Status: Pass

Code:

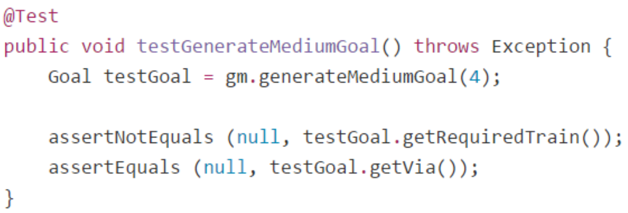


```
@Test
public void testGenerateEasyGoal() throws Exception {
    Goal testGoal = gm.generateEasyGoal(4);

    assertEquals (null, testGoal.getVia());
    assertEquals (null, testGoal.getRequiredTrain());
}
```

Id: U2
Description: test that medium goals don't ask for a specific 'via' station but do ask for a specific train.
Related Requirements: SR 3c
Category: Unit /Component Testing
Status: Pass

Code:

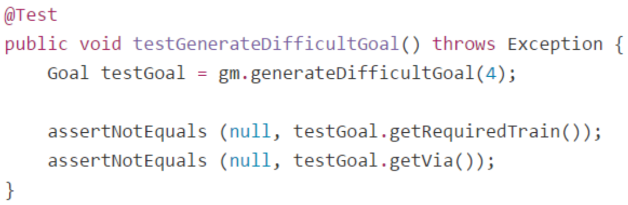


```
@Test
public void testGenerateMediumGoal() throws Exception {
    Goal testGoal = gm.generateMediumGoal(4);

    assertNotEquals (null, testGoal.getRequiredTrain());
    assertEquals (null, testGoal.getVia());
}
```

Id: U3
Description: test that difficult goals do ask for a specific train and a specific 'via' station.
Related Requirements: SR 3c
Category: Unit/Component Testing
Status: Pass

Code:



```
@Test
public void testGenerateDifficultGoal() throws Exception {
    Goal testGoal = gm.generateDifficultGoal(4);

    assertNotEquals (null, testGoal.getRequiredTrain());
    assertNotEquals (null, testGoal.getVia());
}
```

Performance Tests

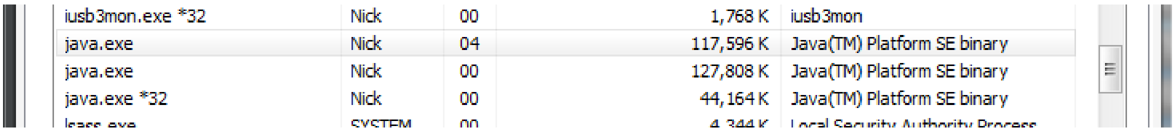
Id: P1

Description: test that the game doesn’t use up too much CPU.

Related Requirements: -

Category: Performance Testing

Status: Pass – the game uses 4% of the CPU which was ruled an acceptable amount by all team members



iusb3mon.exe *32	Nick	00	1,768 K	iusb3mon
java.exe	Nick	04	117,596 K	Java(TM) Platform SE binary
java.exe	Nick	00	127,808 K	Java(TM) Platform SE binary
java.exe *32	Nick	00	44,164 K	Java(TM) Platform SE binary
lsass.exe	SYSTEM	00	4,344 K	Local Security Authority Process

Regression Tests

(Evidence for the regression tests can be found in the corresponding Interface tests above)

Id: R1 *(I1)*

Description: test of junction failure - does the junction failure prevent a train from travelling along that route

Related Requirements: SR 5e

Category: Interface Testing, Regression Testing

Status: Pass/Fail - The test passed in that if a junction has failed, you may not select a route including that junction. However it also failed in that if you’ve already selected a route, and then the junction fails as you’re travelling along the route, the junction failure does not stop the train from travelling via the junction.

Id: R1 *(I2)*

Description: retest of junction failure - does the junction failure prevent a train from travelling along that route

Related Requirements: SR 5e

Category: Interface Testing, Regression Testing

Status: Pass - The changes made to the script have fixed the previously reported problem.

Id: R2 *(I5)*

Description: test the scoring mechanism for a medium goal for the completion of one goal, using the correct train

Related Requirements: SR 3a and SR 3b and SR 3c and SR 4b

Category: Interface Testing, Regression Testing

Status: Fail - the system doesn’t recognise that the correct train type has been used.

Id: R2 *(I6)*

Description: retest the scoring mechanism for a medium goal for the completion of one goal, using the correct train

Related Requirements: SR 3a and SR 3b and SR 3c and SR 4b

Category: Interface Testing, Regression Testing

Status: Pass - the equality between train names was modified and the system now recognises if the correct train type has been used

Id: R3 *(I8)*
Description: test the scoring mechanism for a difficult goal for the completion of one goal, travelling via the specified station
Related Requirements: SR 3a and SR 3b and SR 3c and SR 4b
Category: Interface Testing, Regression Testing
Status: Fail - The scoring mechanism does not recognise that the goal has been completed.

Id: R3 *(I9)*
Description: retest the scoring mechanism for a difficult goal for the completion of one goal, travelling via the specified station
Related Requirements: SR 3a and SR 3b and SR 3c and SR 4b
Category: Interface Testing, Regression Testing
Status: Pass

Id: R4 *(I12)*
Description: test whether the game indicates the winner at the end of the game depending upon their score
Related Requirements: SR 3d
Category: Interface Testing, Regression Testing
Status: Fail – the game indicated that there was a Tie

Id: R4 *(I13)*
Description: retest whether the game indicates the winner at the end of the game depending upon their score
Related Requirements: SR 3d
Category: Interface Testing, Regression Testing
Status: Pass

Id: R5 *(I14)*
Description: test whether the game indicates that there is a draw if both players end with the same score
Related Requirements: SR 3g
Category: Interface Testing, Regression Testing
Status: Fail – the game indicated that there was no winner in this case.

Id: R5 *(I15)*
Description: retest whether the game indicates that there is a draw if both players end with the same score
Related Requirements: SR 3g
Category: Interface Testing, Regression Testing
Status: Pass – the game now indicates that there has been a tie.

Test Coverage/Completeness

Whilst only three unit tests were written for this assessment, it was determined that these were the only possible tests that could be written for the modifications made. Of all modifications made, only the code written to fulfil the quantifiable goals feature made some changes that were recordable within the system.

As the choice between which type of goal is chosen was determined via probabilities, it wasn't possible to test that a certain type of goal was generated through the use of unit tests. Similarly, the code written for the generation and solution of broken tracks and junction failures included some use of probabilities, and as such could not be tested via unit tests. Since scoring was determined through the completion of generated goals, this in some way also relied on probabilities and so couldn't be tested.

All of these features were then tested through the use of system/interface tests. These system tests are recorded below and indicate their related user and system requirements. Evidence, in the form of screen shots of the game, are provided where possible for the system/interface tests that were undertaken.

Where necessary (where a test failure occurred) the code was edited to try and fix the issue and the test was run again. This second iteration of the test was recorded provided that the test now passed. These are shown under the Regression Tests section of this document. Technically, all tests were rerun after every modification of the code in order to ensure that the modification did not interfere with some other part of the code. These regression tests were not recorded as there were too many instances.

Due to the indication in the evidence of testing provided by team FVS, that the game initially used too much CPU, performance testing was done to ensure that all modifications made did not affect the CPU usage of the game.

Every feature, system and user requirement indicated in the 'Features To Be Tested' section of the test plan has a corresponding test listed below.