

# EBLOCKS SOFTWARE Assessment

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## Overall Solution Layout (Visual Studio 2019, WPF .NET Core)

Folder	Usage
TrainRoutes (root)	Contains MainWindow View and Assembly files.
ALL (Application Logic Layer)	Contains TrainRouteCalcs to calculate assessment tests.
DAL (Data Logic Layer)	Contains daRoutes for reading and setup of data.
Models	Contains the Route model class.
Repository	Contains the trainroutes.txt test data file.
ViewModels	Contains vmRoutes for retrieving data for the view.

## About the UI

- The initial view is divided into blocks for the different assessment test.
- The first two blocks are simply for reference.
- Assessment 1 to 5 is processed by the same algorithm.
- Assessment 8 to 9 is also process by the same algorithm.

- The view is already initialized with basic values from the assessment tests.
- Simply click the Calc buttons to see the results (as shown below).
- Please select different values for Assessment 1-5 and Assessment 8-9.

Train Routes (EBLOCKS SOFTWARE Assessment)

Loaded Train Route Data: AB5 BC4 CD8 DC8 DE6 AD5 CE2 EB3 AE7

**One Stop Distance Calculation (Check Above Train Routes)**  
Start: A End: B Calc Route: AB Distance: 5

**ASSESSMENT 1-5 : Route Total Distance**  
Route (ie. ABC or abcd: abc Calc Distance: 9

**ASSESSMENT 6 : Routes from Start to End With Max Stops**  
Start: C End: C Max Stops: 3 Calc Routes Found: 2  
CDC  
CEBC

**ASSESSMENT 7 : Routes from Start to End With Number of Stops**  
Start: A End: C No. Stops: 4 Calc Routes Found: 3  
ABCDC  
ADCDC  
ADEBC

**ASSESSMENT 8-9 : Routes from Start to End With Shortest Distance**  
Start: A End: C Search Loops: 4 Calc Routes Found: 1  
ABC Dist: 9

**ASSESSMENT 10 : Routes from Start to End Within Distance**  
Start: C End: C Search Loops: 10 Less Distance: 30 Calc Routes Found: 7  
CDC Dist: 16  
CEBC Dist: 9  
CDEBC Dist: 21  
CDCEBC Dist: 25  
CEBCDC Dist: 25  
CEBCEBC Dist: 18

**NOTE:** For actual implementation, a more generic UI should be used with perhaps a list of radio buttons for the various calculations.

## The Algorithms

- The flagship algorithm is ALL/TrainRoutesCalcs.cs/GetRouteCombos which omputes the possible routes between a start station and end station.
- The All/TrainRouteCalcs.cs object contains filter methods for the different assessment test.
- All filter methods will be from a start and stop station.

Method	Usage
GetTotalDistance	Returns distance between start and end stations
FilterRoutesWithMaxStops	Returns routes with less than or equal maximum stops.
FilterRoutesWithNumberStops	Returns routes with exact number of stops.
FilterRouteWithShortestDistance	Returns routes with shortest distance (start to stop)
FilterRoutesWithLessThanDistance	Returns routes with less than specified distance.