import

```
In[2]:= data = Association@Import[FileNameJoin[{NotebookDirectory[], "data.json"}]];
```

```
In[3]:= data
```

```
Out[3]= ⟨|numberOfContainers → 80, … 9 …, solutionsStat →
          {{236.523, 236.523, 233.577, 233.577, 233.577, 232.983, 232.983, 231.987, 231.987,
            230.959, 230.959, … 129 …, 210.266, 210.266, 210.266, 209.871, 209.871,
            209.871, 209.871, 209.871, 209.871, 209.871, 209.871}, … 3 …, {… 1 …}}|⟩

        large output | show less | show more | show all | set size limit...
```

```
In[4]:= isImport = True;
```

```
In[5]:= Clear[import]
        import[input_, key_, isImport_] := If[isImport, data[key], input]
```

settings

functions

```
In[7]:= getVarianteTwoArg =
          RandomVariate@MultinomialDistribution[#1, ConstantArray[1 / #2, #2]] &;
```

initial parameters

```
In[8]:= numberOfContainers = import[7, "numberOfContainers", isImport];
        numberOfVehicles = import[2, "numberOfVehicles", isImport];
        numberOfStacks = import[2, "numberOfStacks", isImport];
```

```
In[11]:= ϵ = 0.1;
         shareOfPairsBlocks = 0.05;
```

generate initial data

```
In[13]:= vertices1 = Range@numberOfContainers;
         vertices2 = vertices1 + numberOfContainers;
```

```
In[15]:= If[
           isImport,
           pointsVertices1 = data["pointsVertices1"];
           pointsVertices2 = data["pointsVertices2"],
           {pointsVertices1, pointsVertices2} =
             Table[RandomReal[{1, 5}, {numberOfContainers, 2}], 2];
          ];

In[16]:= distanceMatrix = DistanceMatrix[pointsVertices1, pointsVertices2];

In[17]:= points = Join[pointsVertices1, pointsVertices2];

In[18]:= δ1 = δ2 = Ceiling@Mean@Flatten@distanceMatrix;

In[19]:= outArcs = MapThread[DirectedEdge, {vertices1, vertices2}];
         inArcs = DeleteCases[Flatten[Outer[DirectedEdge, vertices2, vertices1]],
             i_ ↦ j_ /; i - numberOfContainers == j];
         startArcs = Thread[DirectedEdge[0, vertices1]];
         endArcs = Thread[DirectedEdge[vertices2, 2 numberOfContainers + 1]];
         arcs = Join[startArcs, inArcs, outArcs, endArcs];

In[24]:= time = Join[
             Association[# → distanceMatrix⟦#⟦1⟧, #⟦2⟧ - numberOfContainers⟧ & /@ outArcs],
             Association[# → distanceMatrix⟦#⟦2⟧, #⟦1⟧ - numberOfContainers⟧ & /@ inArcs],
             Association[# → 0 & /@ startArcs],
             Association[# → 0 & /@ endArcs]
           ];

In[25]:= If[
           isImport,
           stacks = data["stacks"],
           stacks = TakeList[RandomSample@vertices1,
             getVarianteTwoArg[numberOfContainers, numberOfStacks]]
          ];

In[26]:= If[
           isImport,
           pairsVertices1 = data["pairsVertices1"];
           pairsVertices2 = data["pairsVertices2"],
           {pairsVertices1, pairsVertices2} =
             RandomSample[#, Floor[shareOfPairsBlocks Length@#]] &@Subsets[#, {2}] & /@
              {vertices1, vertices2};
          ];

In[27]:= relationsPairsVertices1 = Flatten[Subsets[#, {2}] & /@ stacks, 1];

In[28]:= K = numberOfVehicles (Total[Max /@ distanceMatrix] + Total[Max /@ (distanceMatrixᵀ)]);
```

2Opt, 2HOpt, 4Opt functions

```
In[29]:= Clear[f]
         f[x_] :=
          Total[distanceMatrix⟦#⟦1⟧, #⟦2⟧⟧ & /@ Partition[x, 2, 1]] + distanceMatrix⟦x⟦-1⟧, x⟦1⟧⟧
```

```
In[31]:= Clear[inverse]
         inverse[permutation_, i1_, j1_] := Module[
            {p = permutation, sortedij = Sort[{i1, j1}], i, j, oldi},
            i = sortedij⟦1⟧;
            j = sortedij⟦2⟧;
            If[
             j - i == Length[p] - 1,
             oldi = p⟦i⟧; p⟦i⟧ = p⟦j⟧; p⟦j⟧ = oldi; p,
             Join[p⟦1 ;; i - 1⟧, Reverse[p⟦i ;; j⟧], p⟦j + 1 ;; Length@p⟧]
            ]
          ]
```

```
In[33]:= Clear[insert]
         insert[permutation_, i_, j_] := Module[
            {p = permutation, element = permutation⟦j⟧},
            p = Drop[p, {j}]; Insert[p, element, i]
          ]
```

```
In[35]:= Clear[swap]
         swap[permutation_, i_, j_] := Module[
            {p = permutation, element = permutation⟦i⟧},
            p⟦i⟧ = p⟦j⟧; p⟦j⟧ = element; p
          ]
```

curing routes

```
In[37]:= (*Пары для каждого маршрута, котрые надо проверить*)
         Clear[pairsForRoute]
         pairsForRoute[route_] :=
          Select[relationsPairsVertices1, MemberQ[route, #⟦1⟧] ∧ MemberQ[route, #⟦2⟧] &]
```

```
In[39]:= (*Устранение недопустимых решений*)
         Clear[cureFunction]
         cureFunction[routesOfTrip_] := Module[
            {routes = routesOfTrip, pairs, begin, pair, positions},
            Do[
             pairs = pairsForRoute[routes⟦i⟧];
             Label[begin];
             Do[
              pair = pairs⟦j⟧;
              positions = Flatten[Position[routes⟦i⟧, #] & /@ pair];
              If[
               positions⟦1⟧ < positions⟦2⟧,
               routes⟦i⟧ = swap[routes⟦i⟧, positions⟦1⟧, positions⟦2⟧]; Goto[begin]
              ],
              {j, Length[pairs]}
             ],
             {i, Length[routes]}
            ];
            routes
           ]
```

find potentials

variables

```
In[41]:= varsU = u /@ Range[2 numberOfContainers];
         varsUOut = u[0, #] & /@ Range[numberOfVehicles];
         varsUIn = u[2 numberOfContainers + 1, #] & /@ Range[numberOfVehicles];
```

```
In[44]:= varsYPV1 = y @@@ pairsVertices1;
         varsYPV2 = y @@@ pairsVertices2;
```

```
In[46]:= vars = Join[varsU, varsUOut, varsUIn, varsYPV1, varsYPV2, {umax}];
```

objfun

```
In[47]:= objfun = {Total[varsUIn - varsUOut], umax}.{0.5, 0.5};
```

```
In[48]:= c = Last@CoefficientArrays[objfun, vars];
```

constraints

```
In[49]:= cons1 = umax - varsUIn;
```

```
In[50]:= rhs1 = ConstantArray[{0, 1}, Length[cons1]];
```

```
In[51]:= cons2 = u[#⟦1⟧] - u[#⟦2⟧] & /@ relationsPairsVertices1;
```

```
In[52]:= rhs2 = ConstantArray[{δ1, 1}, Length[relationsPairsVertices1]];

In[53]:= cons31 = u[#⟦2⟧] - u[#⟦1⟧] - K * y[#⟦1⟧, #⟦2⟧] & /@ pairsVertices1;

In[54]:= rhs31 = ConstantArray[{-δ2, -1}, Length[pairsVertices1]];

In[55]:= cons32 = u[#⟦1⟧] - u[#⟦2⟧] + K * y[#⟦1⟧, #⟦2⟧] & /@ pairsVertices1;

In[56]:= rhs32 = ConstantArray[{K - δ2, -1}, Length[pairsVertices1]];

In[57]:= cons41 = u[#⟦2⟧] - u[#⟦1⟧] - K * y[#⟦1⟧, #⟦2⟧] & /@ pairsVertices2;

In[58]:= rhs41 = ConstantArray[{-δ2, -1}, Length[pairsVertices2]];

In[59]:= cons42 = u[#⟦1⟧] - u[#⟦2⟧] + K * y[#⟦1⟧, #⟦2⟧] & /@ pairsVertices2;

In[60]:= rhs42 = ConstantArray[{K - δ2, -1}, Length[pairsVertices2]];

In[61]:= lu = Join[
            ConstantArray[{0, K}, Length[varsU] + Length[varsUOut] + Length[varsUIn]],
            ConstantArray[{0, 1}, Length[varsYPV1] + Length[varsYPV2]],
            ConstantArray[{0, K}, 1]
          ];

In[62]:= domain = Join[
            ConstantArray[Reals, Length[varsU] + Length[varsUOut] + Length[varsUIn]],
            ConstantArray[Integers, Length[varsYPV1] + Length[varsYPV2]],
            ConstantArray[Reals, 1]
          ];
```

gurobi settings

```
In[63]:= Get[FileNameJoin[{NotebookDirectory[], "GurobiOptimization.wl"}]]

In[64]:= directory = "C:\\gurobi912\\win64\\bin\\";
```

main function

```
In[65]:= (*Сокращенных маршруты преобразуются в полные*)
         Clear[fullRoutes]
         fullRoutes := Table[Riffle[#⟦i⟧, #⟦i⟧ + numberOfContainers], {i, Length[#]}] &

In[67]:= (*Дуги маршрутов полных маршрутов*)
         Clear[pairsOfFullRoutes]
         pairsOfFullRoutes[routes_] := Flatten[Partition[#, 2, 1] & /@ fullRoutes[routes], 1]
```

```
In[69]:= Clear[findPotentials]
         findPotentials[routes_] := Module[{
             cons5FullRoutes = fullRoutes[routes],
             cons5Pairs = pairsOfFullRoutes[routes],
             cons5, rhs5, cons6, rhs6, cons7, rhs7, m, b,
           },
           cons5 = u[#⟦2⟧] - u[#⟦1⟧] & /@ cons5Pairs;
           rhs5 = {time[#⟦1⟧ ⟷ #⟦2⟧], 1} & /@ cons5Pairs;
           cons6 = Flatten[Table[
              If[Length[cons5FullRoutes⟦i⟧] == 0, {},
               {u[First[cons5FullRoutes⟦i⟧]] - u[0, i],
                u[2 numberOfContainers + 1, i] - u[Last[cons5FullRoutes⟦i⟧]]}
              ], {i, Length@cons5FullRoutes}]];
           rhs6 = ConstantArray[{0, 1}, Length[cons6]];
           cons7 = varsUOut;
           rhs7 = {Length[#] * K, -1} & /@ routes;
           m = Last@CoefficientArrays[
              Join[cons1, cons2, cons31, cons32, cons41, cons42, cons5, cons6, cons7], vars];
           b = Join[rhs1, rhs2, rhs31, rhs32, rhs41, rhs42, rhs5, rhs6, rhs7];
           (*LinearProgramming[c,m,b,lu,domain]*)
           GurobiOptimization[Normal@c, Normal@m, b, lu, domain, directory]
          ]
```

target function

```
In[71]:= Clear[f]
         f[routes_] := Module[{
             solution = Quiet@Check[findPotentials[routes], K],
             umax, varsUIn, varsUOut
           },
           If[solution == K, Return[solution]];
           umax = Last[solution];
           varsUIn = solution⟦2 numberOfContainers + numberOfVehicles + 1
              ;; 2 (numberOfContainers + numberOfVehicles)⟧;
           varsUOut = solution⟦2 numberOfContainers + 1 ;; 2 numberOfContainers + numberOfVehicles⟧;
           {Total[varsUIn - varsUOut], umax}.{0.5, 0.5}
          ]
```

simulated annealing

```
In[73]:= Clear[routesToAnnealing]
         routesToAnnealing := Flatten[Riffle[#, 0]] &
```

```
In[75]:= Clear[routesFromAnnealing]
         routesFromAnnealing[routes_] := DeleteCases[#, 0] & /@ (Split[routes, # ≠ 0 &])
```

```
In[77]:= Clear[minimalPermut]
         minimalPermut[routes_, i_, j_, mode_] :=
          Module[{p = RandomReal[], permutation = routesToAnnealing[routes]},
           Switch[
            mode,
            1, MinimalBy[
              {#, f[#]} & /@ (cureFunction[routesFromAnnealing[#]] & /@ {inverse[permutation, i, j],
                  insert[permutation, i, j], swap[permutation, i, j]}), Last]〚1〛,
            2, MinimalBy[{#, f[#]} & /@ (routesFromAnnealing[#] & /@ {inverse[permutation, i, j],
                  insert[permutation, i, j], swap[permutation, i, j]}), Last]〚1〛,
            3, ({#, f[#]} & /@ {routesFromAnnealing@Which[p ≤ 0.5, swap[permutation, i, j],
                  p ≤ 0.7, inverse[permutation, i, j], True, insert[permutation, i, j]]})〚1〛
           ]
          ]
```

use cases minimalPermut

```
In[79]:= Clear[randomRoutes]
         randomRoutes := NestWhile[Flatten /@ TakeList[Reverse /@ stacks,
              getVarianteTwoArg[numberOfStacks, numberOfVehicles]] &, {{}}, MemberQ[{}]]

In[81]:= initialRoutes = randomRoutes

Out[81]= {{24, 62, 69, 77, 14, 45, 37, 47, 26, 33, 38, 49, 3, 70, 12, 67, 5, 54},
          {32, 65, 39, 16, 64, 55, 7, 10, 11, 6, 72, 60, 56, 27, 78, 75, 57, 58, 18, 34,
           71, 41, 19, 53, 48, 66, 8, 29, 80}, {25, 42, 4, 59, 21, 28, 52, 43, 40, 73, 22},
          {9, 51, 76, 31, 35, 68, 36}, {15, 2, 74, 61, 17, 30, 23, 79, 1, 50, 46, 20, 44, 13, 63}}

In[82]:= random = RandomSample[Range[numberOfContainers + numberOfVehicles - 1], 2]

Out[82]= {37, 81}

In[83]:= minimalPermut[initialRoutes, random〚1〛, random〚2〛, 1] // AbsoluteTiming

Out[83]= {3.70804,
          {{{24, 62, 69, 77, 14, 45, 37, 47, 26, 33, 38, 49, 3, 70, 12, 67, 5, 54}, {32, 65, 39, 16, 64,
              55, 7, 10, 11, 6, 72, 60, 56, 27, 78, 75, 57, 20, 79, 1, 50, 46, 15, 2, 74, 61, 17, 30, 23},
            {68, 36, 9, 51, 76, 31, 35}, {43, 40, 73, 22, 25, 42, 4, 59, 21, 28, 52},
            {41, 19, 53, 48, 66, 8, 29, 80, 58, 18, 34, 71, 44, 13, 63}}, 231.737}}

In[84]:= minimalPermut[initialRoutes, random〚1〛, random〚2〛, 2] // AbsoluteTiming

Out[84]= {2.76852,
          {{{24, 62, 69, 77, 14, 45, 37, 47, 26, 33, 38, 49, 3, 70, 12, 67, 5, 54}, {32, 65, 39, 16, 64,
              55, 7, 10, 11, 6, 72, 60, 56, 27, 78, 75, 57, 20, 46, 50, 1, 79, 23, 30, 17, 61, 74, 2, 15},
            {36, 68, 35, 31, 76, 51, 9}, {22, 73, 40, 43, 52, 28, 21, 59, 4, 42, 25},
            {80, 29, 8, 66, 48, 53, 19, 41, 71, 34, 18, 58, 44, 13, 63}}, 231.737}}
```

```
In[85]:= minimalPermut[initialRoutes, random⟦1⟧, random⟦2⟧, 3] // AbsoluteTiming

Out[85]= {0.809619,
          {{{24, 62, 69, 77, 14, 45, 37, 47, 26, 33, 38, 49, 3, 70, 12, 67, 5, 54}, {32, 65, 39, 16, 64,
              55, 7, 10, 11, 6, 72, 60, 56, 27, 78, 75, 57, 20, 18, 34, 71, 41, 19, 53, 48, 66, 8, 29, 80},
            {25, 42, 4, 59, 21, 28, 52, 43, 40, 73, 22}, {9, 51, 76, 31, 35, 68, 36},
            {15, 2, 74, 61, 17, 30, 23, 79, 1, 50, 46, 58, 44, 13, 63}}, 231.737}}
```

simulated annealing function

```
In[86]:= Clear[simulatedAnnealing]
         simulatedAnnealing[routes_, maxIteration_,
           initialTemperature_, endTemperature_, a_, mode_] := Module[
           {currentRoutes = routes, t = initialTemperature,
            randomChoice, p, currentf, fy, history = {}, candidate,
            listToChoose = Range[numberOfContainers + numberOfVehicles - 1]},
           AppendTo[history, {currentRoutes, f[currentRoutes]}];
           Do[
            randomChoice = RandomSample[listToChoose, 2];
            candidate = minimalPermut[currentRoutes, randomChoice⟦1⟧, randomChoice⟦2⟧, mode];
            fy = candidate⟦2⟧;
            currentf = f[currentRoutes];
            If[
             fy ≤ currentf,
             currentRoutes = candidate⟦1⟧,
             p = Exp[(- (fy - currentf)) / t];
             If[RandomReal[] ≤ p, currentRoutes = candidate⟦1⟧]
            ];
            AppendTo[history, {currentRoutes, currentf}];
            t = t * a;
            If[t ≤ endTemperature, Break[]],
            {i, maxIteration}];
           history
          ]
```

main

results

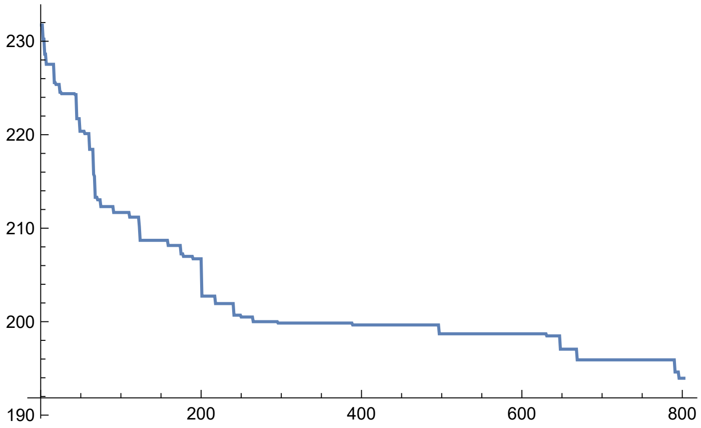
```
In[88]:= initialRoutes = import[randomRoutes, "initialRoutes", isImport]

Out[88]= {{24, 62, 69, 77, 14, 45, 37, 47, 26, 33, 38, 49, 3, 70, 12, 67, 5, 54, 32, 65, 39},
          {16, 64, 55, 7, 10, 11, 6, 72, 60, 56, 27, 78, 75, 57, 58, 18, 34, 71,
           41, 19, 53, 48, 66, 8, 29, 80}, {25, 42, 4, 59, 21, 28, 52, 43, 40, 73, 22},
          {9, 51, 76, 31, 35, 68, 36, 15, 2, 74, 61, 17, 30, 23}, {79, 1, 50, 46, 20, 44, 13, 63}}
```

```
In[89]:=  f[initialRoutes]

Out[89]=  231.737

In[90]:=  solution = If[isImport, data["solution"],
             simulatedAnnealing[initialRoutes, 800, 0.025, 10^-10, 0.99, 1]];

In[91]:=  finalRoute = solution[[-1, 1]]

Out[91]=  {{40, 38, 77, 14, 45, 79, 1, 15, 19, 50, 46, 2, 74, 61, 17, 32, 71, 9, 23, 51, 76, 31, 35},
           {43, 24, 73, 22, 25, 62, 42, 4, 37, 20, 44, 13, 49, 47, 59, 3, 70, 5, 30, 12, 65, 69, 8, 36, 39},
           {16, 64, 75, 57, 55, 41, 7, 10, 58, 11, 56, 6, 18, 34, 63, 67},
           {27, 78, 72, 54, 60, 26, 48, 33, 66, 29, 80}, {21, 28, 52, 53, 68}}

In[92]:=  finalRoutef = solution[[-1, 2]]

Out[92]=  193.948
```

target function value

```
In[93]:=  ListLinePlot[solution[[All, 2]]]
```

Out[93]=

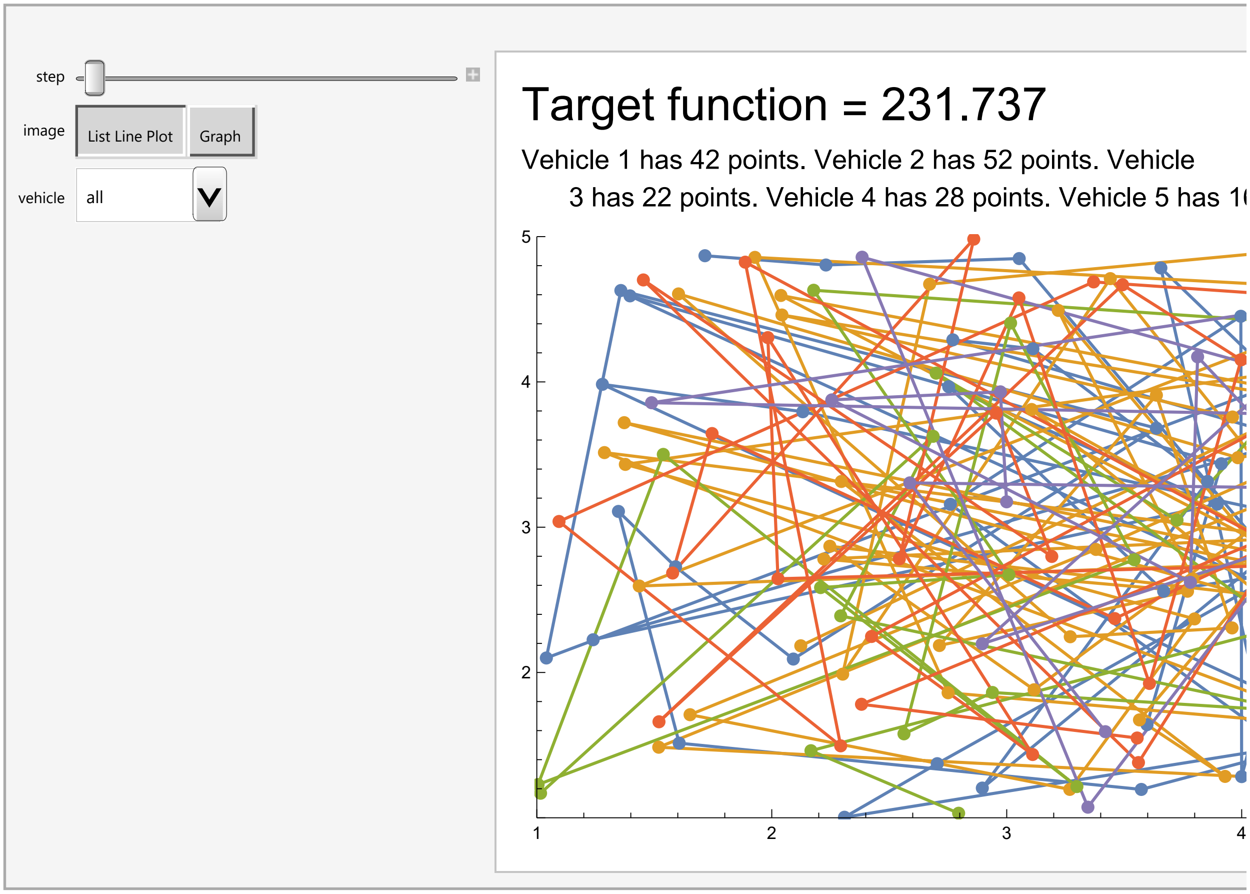


```
In[94]:=  Clear[listLinePlot]
          listLinePlot[fullSolution_, step_, n_] := ListLinePlot[
            points[[#]] & /@
             If[n ≠ numberOfVehicles + 1, fullSolution[[step, 1, n]], fullSolution[[step, 1]]],
            PlotRange → {{1, 5}, {1, 5}},
            PlotLegends → If[n ≠ numberOfVehicles + 1, StringJoin[ToString[n], " vehicle"],
               (StringJoin[ToString[#], " vehicle"] & /@ Range[numberOfVehicles])],
            Epilog → PointSize[Large], ImageSize → 500, Mesh → All
           ]
```

```
In[96]:= Clear[graph]
         graph[fullSolution_, step_, n_] := Module[{edgesPairs, edgesStyle,
              c = Table[Hue[i / numberOfVehicles, 1, 1], {i, numberOfVehicles}]},
             If[
              n ≠ numberOfVehicles + 1,
              edgesPairs = DirectedEdge @@@ Partition[fullSolution⟦step, 1, n⟧, 2, 1],
              edgesPairs = DirectedEdge @@@ Partition[#, 2, 1] & /@ fullSolution⟦step, 1⟧
             ];
             If[
              n ≠ numberOfVehicles + 1,
              edgesStyle = Flatten[Table[edgesPairs⟦j⟧ → c⟦n⟧, {j, Length[edgesPairs]}]];,
              edgesStyle = Flatten[
                Table[edgesPairs⟦i, j⟧ → c⟦i⟧, {i, numberOfVehicles}, {j, Length[edgesPairs⟦i⟧]}]]
             ];
             Graph[Flatten@edgesPairs, EdgeStyle → edgesStyle, VertexLabels → "Name",
              VertexCoordinates → Table[i →  points⟦i⟧, {i, 1, Length[points]}], ImageSize → 500]
            ]

In[98]:= Clear[manipulate]
         manipulate[solution_, plot_] := Module[{fullSolution},
             fullSolution = {fullRoutes[#⟦1⟧], #⟦2⟧} & /@ solution;
             Manipulate[Column[{
                 Text[Style["Target function = " <> ToString[solution⟦step, 2⟧], 24]],
                 Text[Style[StringJoin[MapIndexed["Vehicle " <> ToString[#2⟦1⟧] <> " has " <>
                        ToString[Length[#1]] <> " points. " &, fullSolution⟦step, 1⟧]], 14]],
                 Switch[image, 1, listLinePlot[fullSolution, step, vehicle], 2,
                  graph[fullSolution, step, vehicle]]
                }], {step, 1, Length[solution], 1}, {image, {1 → "List Line Plot", 2 → "Graph"}},
              {vehicle, Join[{numberOfVehicles + 1 →  "all"},
                 Table[m →  (ToString[m] <> " vehicle"), {m, 1, numberOfVehicles}]]}]
            ]
```

```
In[100]:= manipulate[solution, listLinePlot]
```

Out[100]=



step

image: List Line Plot | Graph

vehicle: all

Target function = 231.737

Vehicle 1 has 42 points. Vehicle 2 has 52 points. Vehicle 3 has 22 points. Vehicle 4 has 28 points. Vehicle 5 has 1

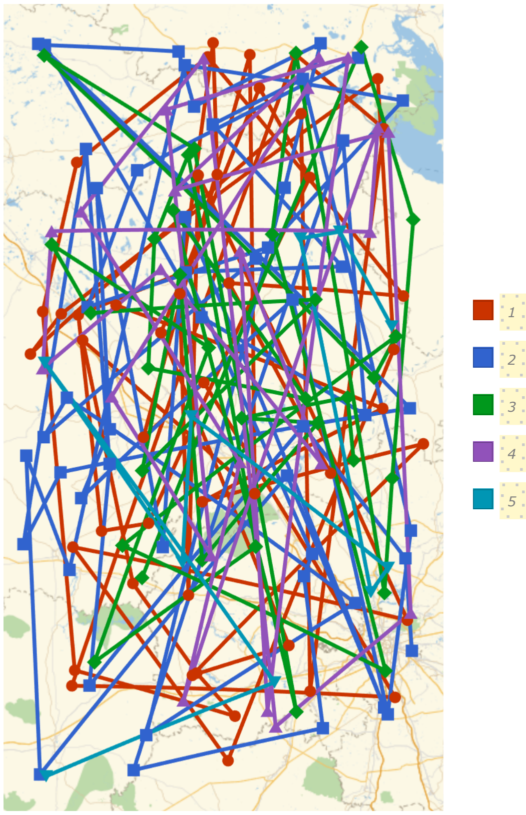
Loading from Wolfram Research server… (59%)
Remaining time 16s

map vizualization

```
In[101]:= newPoints = {#⟦1⟧ + 54, #⟦2⟧ + 33} & /@ points;
```

```
In[102]:= GeoListPlot[Map[GeoPosition[newPoints[[#]]] &, fullRoutes[finalRoute]], Joined → True]
```

Out[∘]=

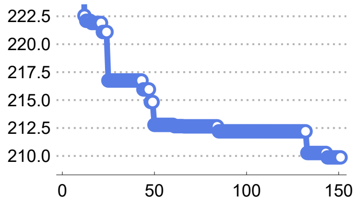
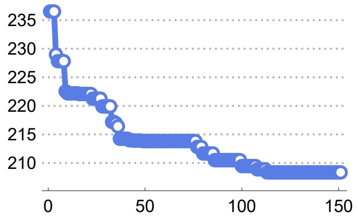
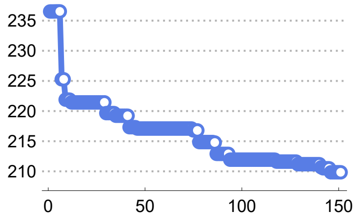
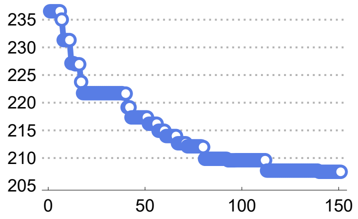


statistics

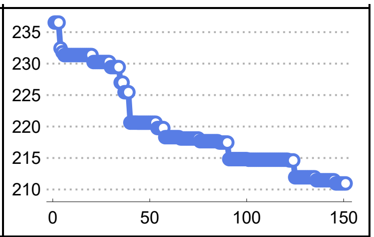
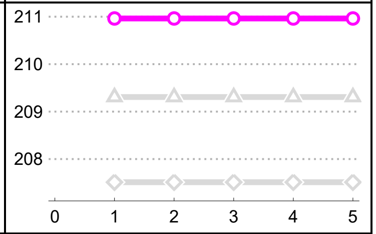
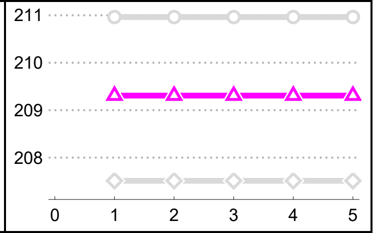
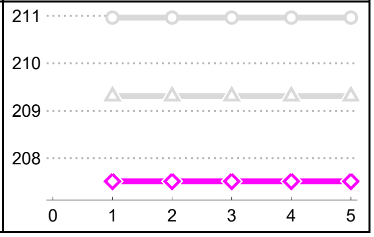
```
In[∘]:= Clear[statistic]
        statistic[n_, iteration_, mode_] :=
         Quiet@Module[{initialRoutes = randomRoutes, solutions = {}, solution},
           Do[solution = simulatedAnnealing[initialRoutes, iteration, 0.55, 10^-10, 0.99, mode];
            AppendTo[solutions, solution[[All, 2]]],
            {i, n}];
           solutions]
```

```
In[∘]:= solutionsStat = If[isImport, data["solutionsStat"], statistic[5, 150, 1]];
```

```
In[•]:= Clear[plotStatistic]
        plotStatistic[solutions_] :=
         Quiet@Module[{initialRoutes = randomRoutes, values = {}, graphics = {},
            solution, stat, colors, str, n = Length@solutions},
          Do[
           AppendTo[values, Last@solution];
           AppendTo[graphics, ListLinePlot[solution, PlotTheme → "Business"]],
           {solution, solutions}];
          stat = {Max[values], Mean[values], Min[values]};
          colors = Permutations[{Magenta, LightGray, LightGray}];
          str = StringJoin[ToString[#], " вариант"] & /@ Range[n];
          If[n > 2,
           values = Join[values, stat];
           graphics = Join[graphics, ListLinePlot[ConstantArray[#, n] & /@ stat,
                PlotTheme → "Business", PlotStyle → #] & /@ colors];
           str = Join[str, {"Худший", "Средний", "Лучший"}];
          ];
          Grid[Transpose@{str, values, graphics}, Frame → All]
         ]

In[•]:= plotStatistic[solutionsStat]
```

1 вариант	209.871	
2 вариант	208.348	
3 вариант	209.841	
4 вариант	207.512	

Out[•]=

5 вариант	210.963	
Худший	210.963	
Средний	209.307	
Лучший	207.512	

In[•]:=

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