```
SetDirectory[
  "C:/Users/serha/OneDrive/Masaüstü/MyRepo/master_thesis_MMT003/210628_finalising/cases"
  ];
```

```
subsetpositionsforsequences = Import["subsetpositionsforsequences.mx"];
```

Objective Function Terms for Fixed Bound Computations

Objective Function Terms Reduced by 75%

```
SeedRandom@5;
subsetpositionsforsequences25percent =
  Table[RandomSample[subsetpositionsforsequences[[i]],
    Round@(Length@subsetpositionsforsequences[[i]] / 4)],
   {i, Length@subsetpositionsforsequences}];
```

```
(*Table[{Length@subsetpositionsforsequences25percent[[i]],
  Length@subsetpositionsforsequences[[i]]},{i,200}]*)

(*Export["subsetpositionsforsequences_75percentdecreased.mx",
  subsetpositionsforsequences25percent];*)
```

Objective Function Terms Reduced by Half

```
SeedRandom@5;
subsetpositionsforsequenceshalf = Table[RandomSample[subsetpositionsforsequences[[i]],
    Round@(Length@subsetpositionsforsequences[[i]] / 2)],
   {i, Length@subsetpositionsforsequences}];

(*Export["subsetpositionsforsequences_half.mx",subsetpositionsforsequenceshalf];*)
```

Objective Function Terms Reduced by 25%

```
SeedRandom@5;
subsetpositionsforsequences75percent =
  Table[RandomSample[subsetpositionsforsequences[[i]],
    Round@(Length@subsetpositionsforsequences[[i]] * 3 / 4)],
   {i, Length@subsetpositionsforsequences}];

(*Export["subsetpositionsforsequences_25percentdecreased.mx",
  subsetpositionsforsequences75percent];*)
```

Objective Function Terms Increased by 10%

```
increasedby10percent =
  Round@(Table[Length@subsetpositionsforsequences[[i]], {i, 200}] * 1.1);
Print["Percentage of Reactions exceed upper bound: %",
 (Length@Cases[increasedby10percent, _?(# > 1008 &)]) /
   Length@subsetpositionsforsequences * 100]
```

```
Percentage of Reactions exceed upper bound: %8
```

```
increasedby10percenthighvaluesreplaced = ReplacePart[
   increasedby10percent, Position[increasedby10percent, _?(# > 1008 &)] → 1008];
```

```
In[•]:= SeedRandom@5;
added =
  Table[Join[subsetpositionsforsequences[[i]], RandomSample[Complement[Range@1008,
      subsetpositionsforsequences[[i]]], increasedby10percenthighvaluesreplaced[[i]] -
      Length@subsetpositionsforsequences[[i]]]], {i, 200}];

In[•]:= (*Table[{Length@subsetpositionsforsequences[[i]],Length@added[[i]]},{i,200}]*)

(*Export["subsetpositionsforsequences_10percentincreased.mx",added];*)
```

Objective Function Terms for Fixed Coefficient Computations

(2, 4)

```
In[•]:= SeedRandom@5;
coefficients =
 Table[Table[RandomReal[{2, 4}, Length@i], 50], {i, subsetpositionsforsequences}];
Dimensions@coefficients
Dimensions@coefficients[[2]]
Dimensions@coefficients[[3]]
Dimensions@subsetpositionsforsequences

Out[•]= {200, 50}

Out[•]= {50, 834}

Out[•]= {50, 590}

Out[•]= {200}

In[•]:= fluxexchanges = 1008;
objectivefunctionsp2p4 = Table[Table[ReplacePart[ConstantArray[0., fluxexchanges],
     MapThread[#1 → #2 &, {subsetpositionsforsequences[[j]], coefficients[[j, i]]}]],
    {i, 50}], {j, Length@subsetpositionsforsequences}];
Dimensions@objectivefunctionsp2p4

Out[•]= {200, 50, 1008}

(*Export["C:/Users/serha/NonDrive/OR_model-25.06.2021/objective_functions/(2,4)
    objfunc_fxdcoeffs.mx",objectivefunctionsp2p4];*)
```

(-1, 1)

```
In[•]:= SeedRandom@5;
coefficients =
 Table[Table[RandomReal[{-1, 1}, Length@i], 50], {i, subsetpositionsforsequences}];
Dimensions@coefficients
Dimensions@coefficients[[2]]
Dimensions@coefficients[[3]]
Dimensions@subsetpositionsforsequences

Out[•]= {200, 50}

Out[•]= {50, 834}
```

Out[•]= {50, 590}

Out[•]= {200}

In[•]:=
```
fluxexchanges = 1008;
objectivefunctionsm1p1 = Table[Table[ReplacePart[ConstantArray[0., fluxexchanges],
     MapThread[#1 → #2 &, {subsetpositionsforsequences[[j]], coefficients[[j, i]]}]],
    {i, 50}], {j, Length@subsetpositionsforsequences}];
Dimensions@objectivefunctionsm1p1
```

Out[•]= {200, 50, 1008}

```
(*Export["C:/Users/serha/NonDrive/OR_model-25.06.2021/objective_functions/(-1,1)
    objfunc_fxdcoeffs.mx",objectivefunctionsm1p1];*)
```