

# Programming Assignment 5

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5/30/22

Tsp12.txt:

```
C:\Users\dddwe\.jdk\openjdk-17.0.1\bin\java.exe "-javaagent:C:\Program  
Files\JetBrains\IntelliJ IDEA Community Edition 2021.2.3\lib\idea_rt.jar=52976:C:\Program  
Files\JetBrains\IntelliJ IDEA Community Edition 2021.2.3\bin" -Dfile.encoding=UTF-8  
-classpath "C:\Users\dddwe\IdeaProjects\Project 5\out\production\Project 5" Project5
```

Input filename:

tsp12.txt

The most cost efficient tour is 16050

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11

The most cost efficient tour is 15950

1  
2  
3  
4  
5  
6  
7  
9  
10  
8  
11

The most cost efficient tour is 15240

1

2  
3  
4  
5  
6  
7  
10  
9  
8  
11

The most cost efficient tour is 14350

1  
2  
3  
4  
5  
6  
11  
8  
9  
10  
7

The most cost efficient tour is 14140

1  
2  
3  
4  
5  
7  
6  
9  
8  
10  
11

The most cost efficient tour is 13620

1  
2  
3  
4  
5

7

6

9

10

8

11

The most cost efficient tour is 13290

1

2

3

4

5

7

6

11

8

9

10

The most cost efficient tour is 12570

1

2

3

4

5

7

6

11

8

10

9

The most cost efficient tour is 12560

1

2

3

4

5

8

9

10

7

6

11

The most cost efficient tour is 12020

1

2

3

4

5

8

9

10

11

6

7

The most cost efficient tour is 11960

1

2

3

5

4

7

6

11

8

9

10

The most cost efficient tour is 11240

1

2

3

5

4

7

6

11

8

10

9

The most cost efficient tour is 10730

1

2  
3  
5  
4  
8  
9  
10  
7  
6  
11

The most cost efficient tour is 10190

1  
2  
3  
5  
4  
8  
9  
10  
11  
6  
7

The most cost efficient tour is 9970

1  
2  
4  
5  
3  
8  
9  
10  
7  
6  
11

The most cost efficient tour is 9430

1  
2  
4  
5  
3

8

9

10

11

6

7

The most cost efficient tour is 9310

1

2

4

5

3

9

10

8

11

6

7

The most cost efficient tour is 9140

1

2

4

5

8

10

9

3

11

6

7

The most cost efficient tour is 9120

1

2

9

10

7

6

11

3

8

4

5

The most cost efficient tour is 8650

1

2

9

10

8

4

5

3

11

6

7

The most cost efficient tour is 8420

4

5

3

8

10

9

2

1

11

6

7

The most cost efficient tour is 8320

5

3

8

10

9

2

4

1

11

6

7

The most cost efficient tour is 8210

5

3  
9  
10  
8  
4  
2  
1  
11  
6  
7

Process finished with exit code 0

Tsp14.txt:

```
C:\Users\dddwe\.jdk\openjdk-17.0.1\bin\java.exe "-javaagent:C:\Program  
Files\JetBrains\IntelliJ IDEA Community Edition 2021.2.3\lib\idea_rt.jar=53105:C:\Program  
Files\JetBrains\IntelliJ IDEA Community Edition 2021.2.3\bin" -Dfile.encoding=UTF-8  
-classpath "C:\Users\dddwe\IdeaProjects\Project 5\out\production\Project 5" Project5  
Input filename:
```

tsp14.txt

The most cost efficient tour is 19850

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13

The most cost efficient tour is 18730

1  
2  
3



- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 13
- 12

The most cost efficient tour is 18330

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 13
- 11
- 12

The most cost efficient tour is 18110

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 9
- 10
- 8
- 13
- 11
- 12

The most cost efficient tour is 17920

- 1

2  
3  
4  
5  
6  
7  
10  
9  
8  
11  
13  
12

The most cost efficient tour is 17400

1  
2  
3  
4  
5  
6  
7  
10  
9  
8  
13  
11  
12

The most cost efficient tour is 16820

1  
2  
3  
4  
5  
7  
6  
9  
8  
10  
11  
13  
12

The most cost efficient tour is 16420

1  
2  
3  
4  
5  
7  
6  
9  
8  
10  
13  
11  
12

The most cost efficient tour is 16300

1  
2  
3  
4  
5  
7  
6  
9  
10  
8  
11  
13  
12

The most cost efficient tour is 15780

1  
2  
3  
4  
5  
7  
6  
9  
10  
8  
13

11

12

The most cost efficient tour is 15570

1

2

3

4

5

7

6

11

12

13

8

10

9

The most cost efficient tour is 15240

1

2

3

4

5

8

9

10

7

6

11

13

12

The most cost efficient tour is 15140

1

2

3

4

5

8

9

10

13

12

11

6

7

The most cost efficient tour is 14870

1

2

3

4

12

13

11

6

7

10

9

8

5

The most cost efficient tour is 14450

1

2

3

5

4

7

6

9

10

8

13

11

12

The most cost efficient tour is 14240

1

2

3

5

4

7

6

11

12

13

8

10

9

The most cost efficient tour is 13410

1

2

3

5

4

8

9

10

7

6

11

13

12

The most cost efficient tour is 13310

1

2

3

5

4

8

9

10

13

12

11

6

7

The most cost efficient tour is 13050

1

2

3

5

8

4  
12  
13  
11  
6  
7  
10  
9

The most cost efficient tour is 13040

1  
2  
3  
5  
8  
10  
9  
4  
12  
13  
11  
6  
7

The most cost efficient tour is 12950

1  
2  
3  
9  
10  
8  
5  
4  
12  
13  
11  
6  
7

The most cost efficient tour is 12650

1  
2  
4

5  
3  
8  
9  
10  
7  
6  
11  
13  
12

The most cost efficient tour is 12550

1  
2  
4  
5  
3  
8  
9  
10  
13  
12  
11  
6  
7

The most cost efficient tour is 12310

1  
2  
4  
5  
3  
9  
10  
8  
13  
12  
11  
6  
7

The most cost efficient tour is 12280

1



2  
4  
12  
13  
11  
6  
7  
10  
9  
8  
3  
5

The most cost efficient tour is 12250

1  
2  
5  
3  
9  
10  
8  
4  
12  
13  
11  
6  
7

The most cost efficient tour is 12100

1  
2  
8  
4  
12  
13  
11  
6  
7  
10  
9  
3  
5

The most cost efficient tour is 11930

1  
2  
8  
10  
9  
3  
5  
4  
12  
13  
11  
6  
7

The most cost efficient tour is 11700

1  
2  
9  
10  
8  
3  
5  
4  
12  
13  
11  
6  
7

The most cost efficient tour is 11190

1  
2  
12  
4  
5  
3  
8  
9  
10  
13  
11

6

7

The most cost efficient tour is 10950

1

2

12

4

5

3

9

10

8

13

11

6

7

The most cost efficient tour is 10700

1

13

3

5

4

8

10

9

2

12

11

6

7

The most cost efficient tour is 10560

1

13

8

3

5

4

12

2

9

10

11

6

7

The most cost efficient tour is 10360

1

13

8

4

12

2

9

10

7

6

11

3

5

The most cost efficient tour is 10190

1

13

8

10

9

2

12

4

5

3

11

6

7

The most cost efficient tour is 10050

1

13

11

6

7

10

9

2

12

4

8

3

5

The most cost efficient tour is 10000

5

3

8

4

12

2

1

13

11

6

7

10

9

The most cost efficient tour is 9580

5

3

8

4

12

2

9

10

13

1

11

6

7

Process finished with exit code 0

Tsp16.txt:

```
C:\Users\dddwe\.jdk\openjdk-17.0.1\bin\java.exe "-javaagent:C:\Program
Files\JetBrains\IntelliJ IDEA Community Edition 2021.2.3\lib\idea_rt.jar=52632:C:\Program
Files\JetBrains\IntelliJ IDEA Community Edition 2021.2.3\bin" -Dfile.encoding=UTF-8
-classpath "C:\Users\dddwe\IdeaProjects\Project 5\out\production\Project 5" Project5
```

Input filename:

tsp16.txt

The most cost efficient tour is 34400

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15

The most cost efficient tour is 26780

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
15  
14

The most cost efficient tour is 26770

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
14  
15  
13

The most cost efficient tour is 25460

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
15  
13  
14

The most cost efficient tour is 25440

1  
2  
3  
4  
5  
6  
7

8  
9  
10  
11  
12  
15  
14  
13

The most cost efficient tour is 25380

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
13  
14  
15  
12

The most cost efficient tour is 25110

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
15  
13  
14  
12



The most cost efficient tour is 25100

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
15  
14  
13  
12

The most cost efficient tour is 25090

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
12  
11  
15  
14  
13

The most cost efficient tour is 23490

1  
2  
3  
4  
5  
6  
7

8

9

10

12

13

14

15

11

The most cost efficient tour is 22920

1

2

3

4

5

6

7

8

9

10

13

12

14

15

11

The most cost efficient tour is 21600

1

2

3

4

5

6

7

8

9

10

13

14

12

15

11

The most cost efficient tour is 21580

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
13  
14  
15  
12  
11

The most cost efficient tour is 21570

1  
2  
3  
4  
5  
6  
7  
8  
9  
12  
14  
13  
10  
15  
11

The most cost efficient tour is 21440

1  
2  
3  
4  
5  
6  
7

8

9

13

10

14

12

15

11

The most cost efficient tour is 21420

1

2

3

4

5

6

7

8

9

13

10

14

15

12

11

The most cost efficient tour is 21270

1

2

3

4

5

6

7

8

9

14

13

10

15

12

11

The most cost efficient tour is 20620

1  
2  
3  
4  
5  
6  
7  
8  
11  
9  
10  
13  
14  
15  
12

The most cost efficient tour is 20460

1  
2  
3  
4  
5  
6  
7  
8  
11  
9  
13  
10  
14  
15  
12

The most cost efficient tour is 20310

1  
2  
3  
4  
5  
6  
7

8  
11  
9  
14  
13  
10  
15  
12

The most cost efficient tour is 20260

1  
2  
3  
4  
5  
6  
7  
8  
11  
15  
10  
13  
14  
9  
12

The most cost efficient tour is 20150

1  
2  
3  
4  
5  
6  
7  
9  
13  
10  
14  
15  
12  
8  
11

The most cost efficient tour is 20000

1  
2  
3  
4  
5  
6  
7  
9  
14  
13  
10  
15  
12  
8  
11

The most cost efficient tour is 19870

1  
2  
3  
4  
5  
6  
7  
11  
8  
9  
13  
10  
14  
15  
12

The most cost efficient tour is 19720

1  
2  
3  
4  
5  
6  
7

11

8

9

14

13

10

15

12

The most cost efficient tour is 19560

1

2

3

4

5

6

7

12

15

10

13

14

9

8

11

The most cost efficient tour is 19270

1

2

3

4

5

6

7

15

10

13

14

9

12

8

11



The most cost efficient tour is 19090

1  
2  
3  
4  
5  
6  
10  
13  
9  
12  
14  
15  
7  
11  
8

The most cost efficient tour is 19010

1  
2  
3  
4  
5  
6  
10  
13  
9  
14  
12  
15  
7  
8  
11

The most cost efficient tour is 18810

1  
2  
3  
4  
5  
6  
10

13

9

14

12

15

7

11

8

The most cost efficient tour is 18100

1

2

3

4

5

6

10

13

14

9

12

15

7

8

11

The most cost efficient tour is 17900

1

2

3

4

5

6

10

13

14

9

12

15

7

11

8

The most cost efficient tour is 17780

1  
2  
3  
4  
5  
7  
6  
10  
13  
14  
9  
12  
15  
8  
11

The most cost efficient tour is 17760

1  
2  
3  
4  
5  
7  
6  
10  
13  
14  
15  
12  
9  
8  
11

The most cost efficient tour is 17540

1  
2  
3  
4  
5  
7  
11

8

9

14

13

10

6

15

12

The most cost efficient tour is 17380

1

2

3

4

5

7

12

15

6

10

13

14

9

8

11

The most cost efficient tour is 17090

1

2

3

4

5

7

15

6

10

13

14

9

12

8

11

The most cost efficient tour is 16960

1  
2  
3  
4  
5  
8  
11  
6  
10  
13  
14  
9  
12  
15  
7

The most cost efficient tour is 16850

1  
2  
3  
4  
5  
8  
11  
7  
6  
10  
13  
14  
9  
15  
12

The most cost efficient tour is 16750

1  
2  
3  
4  
5  
8  
11

7  
9  
14  
13  
10  
6  
15  
12

The most cost efficient tour is 16610

1  
2  
3  
4  
5  
8  
11  
7  
12  
15  
6  
10  
13  
14  
9

The most cost efficient tour is 16020

1  
2  
3  
4  
5  
8  
11  
7  
15  
6  
10  
13  
14  
9  
12

The most cost efficient tour is 15710

1  
2  
3  
4  
8  
5  
11  
7  
15  
6  
10  
13  
14  
9  
12

The most cost efficient tour is 15640

1  
2  
3  
4  
8  
11  
5  
7  
15  
6  
10  
13  
14  
9  
12

The most cost efficient tour is 15500

1  
2  
3  
6  
10  
13  
14

9

12

15

7

4

8

5

11

The most cost efficient tour is 15270

1

2

3

6

10

13

14

9

12

15

7

4

8

11

5

The most cost efficient tour is 15170

1

2

3

6

10

13

14

9

12

15

7

5

11

8

4



The most cost efficient tour is 15150

1  
2  
3  
6  
10  
13  
14  
9  
12  
15  
7  
11  
8  
4  
5

The most cost efficient tour is 15140

1  
2  
3  
9  
12  
13  
14  
10  
6  
15  
7  
11  
8  
4  
5

The most cost efficient tour is 14870

1  
2  
3  
9  
12  
14  
13

10

6

15

7

4

8

5

11

The most cost efficient tour is 14640

1

2

3

9

12

14

13

10

6

15

7

4

8

11

5

The most cost efficient tour is 14540

1

2

3

9

12

14

13

10

6

15

7

5

11

8

4

The most cost efficient tour is 14520

1  
2  
3  
9  
12  
14  
13  
10  
6  
15  
7  
11  
8  
4  
5

The most cost efficient tour is 14460

1  
2  
3  
14  
13  
10  
6  
15  
12  
9  
4  
8  
11  
5  
7

The most cost efficient tour is 14360

1  
2  
4  
5  
8  
11  
6

10

13

14

3

9

12

15

7

The most cost efficient tour is 14250

1

2

4

5

8

11

7

6

10

13

14

3

9

15

12

The most cost efficient tour is 14150

1

2

4

5

8

11

7

9

3

14

13

10

6

15

12

The most cost efficient tour is 14010

1  
2  
4  
5  
8  
11  
7  
12  
15  
6  
10  
13  
14  
3  
9

The most cost efficient tour is 14000

1  
2  
4  
5  
8  
11  
7  
15  
6  
10  
13  
3  
14  
9  
12

The most cost efficient tour is 13420

1  
2  
4  
5  
8  
11  
7

15

6

10

13

14

3

9

12

The most cost efficient tour is 13110

1

2

4

8

5

11

7

15

6

10

13

14

3

9

12

The most cost efficient tour is 13040

1

2

4

8

11

5

7

15

6

10

13

14

3

9

12

The most cost efficient tour is 13020

4

5

11

8

2

1

9

3

14

13

10

6

12

15

7

The most cost efficient tour is 12710

4

5

11

8

2

1

9

3

14

13

10

6

15

12

7

The most cost efficient tour is 12660

4

5

11

8

2

1

9

12

3

14

13

10

6

15

7

The most cost efficient tour is 12560

5

11

4

8

2

1

9

3

14

13

10

6

15

12

7

The most cost efficient tour is 12510

5

11

4

8

2

1

9

12

3

14

13

10

6

15

7



The most cost efficient tour is 12270

5

11

8

4

2

1

9

3

14

13

10

6

15

12

7

The most cost efficient tour is 12220

5

11

8

4

2

1

9

12

3

14

13

10

6

15

7

Process finished with exit code 0

Tsp19.txt

```
C:\Users\dddwe\.jdk\openjdk-17.0.1\bin\java.exe "-javaagent:C:\Program
Files\JetBrains\IntelliJ IDEA Community Edition 2021.2.3\lib\idea_rt.jar=50675:C:\Program
Files\JetBrains\IntelliJ IDEA Community Edition 2021.2.3\bin" -Dfile.encoding=UTF-8
-classpath "C:\Users\dddwe\IdeaProjects\Project 5\out\production\Project 5" Project5
Input filename:
```

Tsp19.txt:

The most cost efficient tour is 29360

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The most cost efficient tour is 29300

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The most cost efficient tour is 28910

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The most cost efficient tour is 28430

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The most cost efficient tour is 27430

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The most cost efficient tour is 27390

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The most cost efficient tour is 27280

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The most cost efficient tour is 27260

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The most cost efficient tour is 26230

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The most cost efficient tour is 26210

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The most cost efficient tour is 26120

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The most cost efficient tour is 26080

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The most cost efficient tour is 25980

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The most cost efficient tour is 25830

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The most cost efficient tour is 25790

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The most cost efficient tour is 25680

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The most cost efficient tour is 25670

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The most cost efficient tour is 24630

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The most cost efficient tour is 24610

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The most cost efficient tour is 24520

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The most cost efficient tour is 24510

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The most cost efficient tour is 24210

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The most cost efficient tour is 23920

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The most cost efficient tour is 23880

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The most cost efficient tour is 23770

1

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The most cost efficient tour is 23450

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The most cost efficient tour is 23430

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The most cost efficient tour is 23010

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The most cost efficient tour is 22720

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The most cost efficient tour is 22660

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The most cost efficient tour is 22650

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The most cost efficient tour is 22640

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The most cost efficient tour is 22490

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The most cost efficient tour is 22360

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The most cost efficient tour is 22040

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The most cost efficient tour is 21760

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The most cost efficient tour is 21690

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The most cost efficient tour is 21680

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The most cost efficient tour is 21530

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The most cost efficient tour is 21400

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The most cost efficient tour is 21340

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The most cost efficient tour is 21220

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The most cost efficient tour is 21090

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The most cost efficient tour is 20940

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The most cost efficient tour is 20810

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The most cost efficient tour is 20650

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The most cost efficient tour is 20520

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The most cost efficient tour is 20360

1

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The most cost efficient tour is 20240

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The most cost efficient tour is 20040

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The most cost efficient tour is 20030

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The most cost efficient tour is 19950

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The most cost efficient tour is 19750

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The most cost efficient tour is 19620

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The most cost efficient tour is 19530

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The most cost efficient tour is 19450

Process finished with exit code 130

Tsp29.txt:

```
C:\Users\dddwe\.jdk\openjdk-17.0.1\bin\java.exe "-javaagent:C:\Program  
Files\JetBrains\IntelliJ IDEA Community Edition 2021.2.3\lib\idea_rt.jar=53162:C:\Program  
Files\JetBrains\IntelliJ IDEA Community Edition 2021.2.3\bin" -Dfile.encoding=UTF-8  
-classpath "C:\Users\dddwe\IdeaProjects\Project 5\out\production\Project 5" Project5
```

Input filename:

tsp29.txt

The most cost efficient tour is 46250

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The most cost efficient tour is 46120

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The most cost efficient tour is 43920

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The most cost efficient tour is 43850

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The most cost efficient tour is 42950

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The most cost efficient tour is 42700

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The most cost efficient tour is 42430

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The most cost efficient tour is 42310

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The most cost efficient tour is 42060

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The most cost efficient tour is 41860

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The most cost efficient tour is 41770

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The most cost efficient tour is 41710

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The most cost efficient tour is 41680

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The most cost efficient tour is 41640

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The most cost efficient tour is 41570

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The most cost efficient tour is 40880

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The most cost efficient tour is 40630

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The most cost efficient tour is 40150



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The most cost efficient tour is 40060

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The most cost efficient tour is 40000

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The most cost efficient tour is 39870

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The most cost efficient tour is 39430

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The most cost efficient tour is 39300

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The most cost efficient tour is 38730

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The most cost efficient tour is 38650

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The most cost efficient tour is 38490

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The most cost efficient tour is 38410

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The most cost efficient tour is 38240

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The most cost efficient tour is 38080

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The most cost efficient tour is 38030

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The most cost efficient tour is 37810

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The most cost efficient tour is 37780

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The most cost efficient tour is 37620

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The most cost efficient tour is 37450

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The most cost efficient tour is 37440

Process finished with exit code 130