Programming assignment

VLSI CAD

Problem

- Given P - set of K pins with coordinates (x_i, y_i), $x_i \in [0, N]$, $y_i \in [0, M]$

- Generate Steiner tree for P, minimizing the tree wirelength

- Benchmarks:
  - Max value for N, M: 150
  - number of terminals: 5-100
  - Random pin coordinates
  - No pins in the same grid bin

Solution

- It is recommended not to use existing MST / SMT solutions.
  - Submissions that use them will still be accepted
- Command line application, any programming language, Windows or Linux.
  - Accepts one parameter: input file name
  - Generates output file in the input file's directory.
  - Output file name has suffix "_out"
  - I.e. for input file <test_dir>/test1.xml:
    - Line to run: your_program_name <test_dir>/test1.xml
    - Output file name: <test_dir>/test1_out.xml
- Make sure it is easy to build / get ready to run
- Runtime on a particular benchmark will be limited by 1 min timeout.

Benchmark/solution file format

```
<root>
<grid min_x="0" max_x="150" min_y="0" max_y="150" />
<net>
<point x="1" y="1" layer="pins" />
<point x="2" y="2" layer="pins" />
<point x="3" y="3" layer="pins" />
<point x="1" y="1" layer="pins_m2" />
<point x="2" y="2" layer="pins_m2" />
<point x="2" y="2" layer="m2_m3" />
<point x="2" y="2" layer="m2" />
<point x="3" y="3" layer="pins_m2" />
<point x="2" y="3" layer="m2_m3" />
<point x="2" y="1" layer="m2_m3" />
<segment x1="1 y1="1" x2="2" y2="1" layer="m2" />
<segment x1="2" y1="1" x2="2" y2="3" layer="m3"/ >
<segment x1="2 y1="3" x2="3" y2="3" layer="m2" />
</net>
</root>
```

Both, input for ST generator and routing solution

Routing solution only

"pins" layer for original pins,
"m2" layer for horizontal segments,
"m3" layer for vertical segments,
"m2_m3", "pins_m2" layers for vias.

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Questions?

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