H: Let's suppose that there exists a 1000-approximaton algorithm $\mathcal{A}$ for TSP.

O: We will show that by using this algorithm $\mathcal{A}$ the NP-complete decision problem HAM-CYCLE could be solved in poly time which would imply $P = NP$.

L: To show that HAM-CYCLE is in P, a polinomial algorithm $\mathcal{B}$ will be created using algorithm $\mathcal{A}$: this algorithm $\mathcal{B}$ can decide for any undirected graph G whether G has a Hamiltonian-cycle or not.

I: This algo $\mathcal{B}$ first constructs the following edge-weighted, complete graph G'.

D: The graph G' has as many nodes as G has, in G' all pairs of nodes are connected, and the edge weight is 1 if this edge was present in G, otherwise the edge-weight is $1000 \cdot n + 1$ (where n is the number of the nodes in G).

A: After having constructed this G', algorithm $\mathcal{B}$ runs the approximation algo $\mathcal{A}$ on G' and ...

Y: if $\mathcal{A}$ returns a hamiltonian cycle with length at least $1000 \cdot n + 1$ then algo $\mathcal{B}$ says that G has no hamiltonian cycle, otherwise algo $\mathcal{B}$ says that G has a hamiltonian cycle.