

## Solution

the first professor i saw, was in a very large room, with forty pupils about him. after salutation, observing me to look earnestly upon a frame, which took up the greatest part of both the length and breadth of the room, he said, 'perhaps i might wonder to see him employed in a project for improving speculative knowledge, by practical and mechanical operations. but the world would soon be sensible of its usefulness and he flattered himself, that a more noble, exalted thought never sprang in any other man's head. every one knew how laborious the usual method is of attaining to arts and sciences whereas, by his contrivance, the most ignorant person, at a reasonable charge, and with a little bodily labour, might write books in philosophy, poetry, politics, laws, mathematics, and theology, without the least assistance from genius or study.' he then led me to the frame, about the sides, whereof all his pupils stood in ranks. it was twenty feet square, placed in the middle of the room. the superficies was composed of several bits of wood, about the bigness of a die, but some larger than others. they were all linked together by slender wires. these bits of wood were covered, on every square, with paper pasted on them and on these papers were written all the words of their language, in their several moods, tenses, and declensions but without any order. the professor then desired me 'to observe for he was going to set his engine at work.' the pupils, at his command, took each of them hold of an iron handle, whereof there were forty fixed round the edges of the frame and giving them a sudden turn, the whole disposition of the words was entirely changed. he then commanded sixandthirty of the lads, to read the several lines softly, as they appeared upon the frame and where they found three or four words together that might make

part of a sentence, they dictated to the four remaining boys, who were scribes. this work was repeated three or four times, and at every turn, the engine was so contrived, that the words shifted into new places, as the square bits of wood moved upside down.

**Permutation:**

```
{'a': 'e', 'b': 'n', 'c': 't', 'd': 'm', 'e': '?', 'f': 'w', 'g': '#', 'h': 'j', 'i': ':', 'j': 's', 'k': '!', 'l': 'x', 'm': 'u', 'n': 'q', 'o': 'g', 'p': ',', 'q': 'f', 'r': ' ', 's': 'l', 't': '"', 'u': 'a', 'v': '\n', 'w': 'd', 'x': 'b', 'y': '!', 'z': 'p', '"': 'r', '\n': ')', ':': '(', '!': 'o', ' ': 'c', '(': 'k', '#': 'i', '?': '"', '"': 'y', ' ': 'z', ',': 'h', ')': 'v'}
```

**Values used for simulated annealing:**

Temp: 300

Threshold: 0.00001

Cooling: 0.9990