presentation_1...
simulation.png

WRITEFULL

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```


- Normal Populations with Different Means
- A Connection between Optimization and Statistics

5 Discussion

- Infeasible Start Newton Method

Normal Populations with Different Means

Let X and Y be draw from the normal populations $N(\mu_1, 1)$ with $\mu_1 = 1$ and $N_1 = 100$, and $N(\mu_2, 1)$ with $\mu_2 = 3$ and $N_2 = 120$, respectively. For simplicity, we take $M_1(t) = ct$ and $M_2(t) = t$, where c is a constant. Now, we have

$$R = \frac{\max\{L(p,q) | (p,q) \in \mathrm{R}_+^{n_1} \times \mathrm{R}_+^{n_2}, 1^T p = 1, 1^T q = 1, c\hat{\mu}_1 \le \hat{\mu}_2\}}{\prod_{i=1}^{n_1}(1/k_i)^{k_i} \prod_{j=1}^{n_2}(1/\ell_j)^{\ell_j}}.$$

We take $c = 1, 2, \ldots, 7$ to see its impact toward the ELRT statistic.

Given $\alpha = 0.05$, we have $c_\alpha = 3.8415$. Once the ELRT statistic is known, our decision rule is to reject $H_0 : c\mu_1 \le \mu_2$ if $-2 \log R > 3.8415$. For the