# **Model Optimization and Evaluation Process**

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| --- | --- | --- | --- | --- | --- | --- |
| Iterations | Rank | Genre Feature Added | Regularization parameter (regparam) | Initial R2 | Optimized R2 | Comments |
| 5 | 5 | No | 0.1 | 0.32 |  | Initial model without optimization |
| 10 | 10 | No | 0.2 | 0.32 | 0.31 | Changing parameters, not much improvement |
| 5 | 10 | Yes | 0.1 | 0.32 | 0.54 | Genre feature added, R2 improved significantly |
| 10 | 20 | Yes | 0.2 | 0.54 | 0.41 | Increased all parameters, but performance declined |
| 15 | 40 | Yes | 0.05 | 0.41 | 0.78 | increased iterations and rank and reduced regparam, performance improved significantly |
| 15 | 50 | Yes | 0.05 | 0.78 | 0.79 | Increase in rank, slight improvement |
| 20 | 60 | Yes | 0.05 | 0.79 | 0.80 | Performance increasing slightly |
| 18 | 100 | Yes | 0.05 | 0.80 | 0.81 | Increased Rank, slight increase in performance |