EXAM PROFESSIONAL MACHINE LEARNING ENGINEER TOPIC 1 QUESTION 133 DISCUSSI...

Actual exam question from Google's Professional Machine Learning Engineer
Question #: 133
Topic #: 1
[All Professional Machine Learning Engineer Questions]

You have recently created a proof-of-concept (POC) deep learning model. You are satisfied with the overall architecture, but you need to determine the value for a couple of hyperparameters. You want to perform hyperparameter tuning on Vertex AI to determine both the appropriate embedding dimension for a categorical feature used by your model and the optimal learning rate. You configure the following settings:
• For the embedding dimension, you set the type to INTEGER with a minValue of 16 and maxValue of 64.
• For the learning rate, you set the type to DOUBLE with a minValue of 10e-05 and maxValue of 10e-02.

You are using the default Bayesian optimization tuning algorithm, and you want to maximize model accuracy. Training time is not a concern. How should you set the hyperparameter scaling for each hyperparameter and the maxParallelTrials?

A. Use UNIT_LINEAR_SCALE for the embedding dimension, UNIT_LOG_SCALE for the learning rate, and a large number of parallel trials.

B. Use UNIT_LINEAR_SCALE for the embedding dimension, UNIT_LOG_SCALE for the learning rate, and a small number of parallel trials.

C. Use UNIT_LOG_SCALE for the embedding dimension, UNIT_LINEAR_SCALE for the learning rate, and a large number of parallel trials.

D. Use UNIT_LOG_SCALE for the embedding dimension, UNIT_LINEAR_SCALE for the learning rate, and a small number of parallel trials.

Show Suggested Answer

by mil_spyro at *Dec. 13, 2022, 6:18 p.m.*

Comments

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YangG Highly Voted 1 year, 10 months ago

Selected Answer: B

Vote B

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guilhermebutzke Highly Voted 9 months, 1 week ago

Selected Answer: B

B: Here's why:
Embedding Dimension: UNIT_LINEAR_SCALE is appropriate for integer hyperparameters with a continuous range like the embedding dimension. It linearly scales the search space from minValue to maxValue.

Learning Rate: UNIT_LOG_SCALE is generally recommended for hyperparameters with values spanning multiple orders of magnitude like the learning rate (10e-05 - 10e-02). This ensures equal sampling probability across different log-scaled ranges.

Parallel Trials: as the documentation specifies, parallelization speeds up. However, this speedup comes at the cost of potentially sacrificing the quality of the results. Since training time is not a factor in this case, the benefit of speeding things up with many parallel trials is less valuable.

https://cloud.google.com/vertex-ai/docs/training/using-hyperparameter-tuning#parallel-trials

upvoted 10 times

LFavero 8 months, 1 week ago

this is the perfect answer and explanation.

upvoted 1 times

pinimichele01 Most Recent 6 months, 3 weeks ago

Training time is not a concern -> B (the benefit of speeding things up with many parallel trials is less valuable)

upvoted 1 times

gscharly 6 months, 3 weeks ago

Selected Answer: B

Vote B

upvoted 1 times

Mickey321 11 months, 4 weeks ago

Selected Answer: A

because training time is not a concern and you want to maximize accuracy, using a large number of maxParallelTrials (option A) allows thoroughly searching the hyperparameter space.

upvoted 2 times

Voyager2 1 year, 5 months ago

Selected Answer: B

B. Use UNIT_LINEAR_SCALE for the embedding dimension, UNIT_LOG_SCALE for the learning rate, and a small number of parallel trials.
https://cloud.google.com/vertex-ai/docs/training/using-hyperparameter-tuning
First we should choos an option with small trials:
"Before starting a job with a large number of trials, you may want to start with a small number of trials to gauge the effect your chosen hyperparameters have on your model's accuracy."
Now, the embeddings should be linear https://cloud.google.com/blog/products/gcp/hyperparameter-tuning-on-google-cloud-platform-is-now-faster-and-smarter

upvoted 1 times

M25 1 year, 6 months ago

Selected Answer: B

Went with B

upvoted 1 times

JamesDoe 1 year, 7 months ago

Selected Answer: B

https://cloud.google.com/vertex-ai/docs/training/using-hyperparameter-tuning#parallel-trials
"Running parallel trials has the benefit of reducing the time the training job takes (real time—the total processing time required is not typically changed). However, running in parallel can reduce the effectiveness of the tuning job overall."
Since opt. for accuracy and ignore training time, use above.
Linear for learning rate doesn't really make sense, think that one is obvious imo.

upvoted 2 times

TNT87 1 year, 8 months ago

Selected Answer: B

Answer is B , even my explanation is on B not C
Option B is the best choice: Use UNIT_LOG_SCALE for the embedding dimension, UNIT_LINEAR_SCALE for the learning rate, and a large number of parallel trials.

The reason for this choice is as follows:

For the embedding dimension, it is better to use a logarithmic scale because the effect of increasing the dimensionality is likely to diminish as the dimension grows larger. Therefore, the logarithmic scale will allow the tuning algorithm to explore a wider range of values with less bias towards higher values

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TNT87 1 year, 8 months ago

Selected Answer: C

Option C is the best choice: Use UNIT_LOG_SCALE for the embedding dimension, UNIT_LINEAR_SCALE for the learning rate, and a large number of parallel trials.

The reason for this choice is as follows:

For the embedding dimension, it is better to use a logarithmic scale because the effect of increasing the dimensionality is likely to diminish as the dimension grows larger. Therefore, the logarithmic scale will allow the tuning algorithm to explore a wider range of values with less bias towards higher values

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TNT87 1 year, 8 months ago

Meant to choose B ahhhh

upvoted 1 times

John_Pongthorn 1 year, 9 months ago

Selected Answer: B

Learning Rage is subtle and take time so, it use Log Scale

upvoted 2 times

ares81 1 year, 10 months ago

Selected Answer: B

It's B!

upvoted 1 times

hiromi 1 year, 10 months ago

Selected Answer: A

A
- https://cloud.google.com/ai-platform/training/docs/reference/rest/v1/projects.jobs#HyperparameterSpec
- https://cloud.google.com/vertex-ai/docs/reference/rest/v1beta1/StudySpec

upvoted 1 times

hiromi 1 year, 10 months ago

Sorry, B is the answer

upvoted 1 times

mil_spyro 1 year, 10 months ago

Selected Answer: D

Vote D, this can help the tuning algorithm explore a wider range of values for the learning rate, while also focusing on a smaller range of values for the embedding dimension.

upvoted 2 times

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