Choose Your Own project: Social Determinants of Health (SDoH) as Predictors of Colon Cancer Screening

Shahidul Islam

2024-12-08

Introduction

Cancer screening plays a crucial role in the early detection, diagnosis, and primary or secondary prevention of malignancies. Social determinants of health (SDoH), such as access to adequate food and nutrition, poverty, and health insurance, along with demographic characteristics like age, gender, Body Mass Index (BMI), and racial background, can significantly influence various aspects of healthcare, including colon cancer screening. This study aimed to investigate the predictive ability of SDoH and demographic characteristics for colon cancer screening in an adult patient population.

We assessed and compared predictive ability of clinical features for colon cancer screening between the following predictive models: Logistic Regression (LR), Random Forest(RF), Support Vector Machine(SVM) and Gradient Boosting (XGB). We used "caret" package to perform 10-fold cross validation to assess the models. The metric used for assessing these model was "Area Under the Receiver Operating Characteristic (AUROC) curve.

Dataset

This project utilizes publicly available data from National Health Interview Series (NHIS, https://www.cdc.gov/nchs/nhis/documentation/2019-nhis.html#cdc_data_surveillance_section_3-using-our-data) database from 2018 to 2022. The dataset included ~176K observations, however, the colon cancer screening data along with clinically relevant features were available for ~48K subjects.

```
library(tidyverse)
```

```
## Warning: package 'tidyverse' was built under R version 4.3.3
```

```
## Warning: package 'dplyr' was built under R version 4.3.3
```

```
## -- Attaching core tidyverse packages ------------------------ tidyverse 2.0.0 --
## v dplyr     1.1.4     v readr     2.1.4
## v forcats   1.0.0     v stringr   1.5.0
## v ggplot2   3.4.3     v tibble    3.2.1
## v lubridate 1.9.2     v tidyr     1.3.0
## v purrr     1.0.2
## -- Conflicts ------------------------------------------ tidyverse_conflicts() --
## x dplyr::filter() masks stats::filter()
## x dplyr::lag()    masks stats::lag()
## i Use the conflicted package (<http://conflicted.r-lib.org/>) to force all conflicts to become errors
```

```r
library(haven)
```

```
## Warning: package 'haven' was built under R version 4.3.3
```

```r
library(dplyr)
library(tidyr)
library(ggplot2)
library(psych)
```

```
## Warning: package 'psych' was built under R version 4.3.3
```

```
##
## Attaching package: 'psych'
##
## The following objects are masked from 'package:ggplot2':
##
##     %+%, alpha
```

```r
library(rlang)
```

```
## Warning: package 'rlang' was built under R version 4.3.3
```

```
##
## Attaching package: 'rlang'
##
## The following objects are masked from 'package:purrr':
##
##     %@%, flatten, flatten_chr, flatten_dbl, flatten_int, flatten_lgl,
##     flatten_raw, invoke, splice
```

```r
library(gtsummary)
```

```
## Warning: package 'gtsummary' was built under R version 4.3.3
```

```r
library(glmulti)
```

```
## Warning: package 'glmulti' was built under R version 4.3.3
```

```
## Loading required package: rJava
```

```
## Warning: package 'rJava' was built under R version 4.3.2
```

```
## Loading required package: leaps
```

```
## Warning: package 'leaps' was built under R version 4.3.3
```

```r
library(caret)
```

```
## Loading required package: lattice
##
## Attaching package: 'caret'
##
## The following object is masked from 'package:purrr':
##
##     lift
```

```r
library(purrr)
library(glmnet)
```

```
## Warning: package 'glmnet' was built under R version 4.3.3

## Loading required package: Matrix

## Warning: package 'Matrix' was built under R version 4.3.3

##
## Attaching package: 'Matrix'
##
## The following objects are masked from 'package:tidyr':
##
##     expand, pack, unpack
##
## Loaded glmnet 4.1-8
```

```r
library(epiDisplay)
```

```
## Warning: package 'epiDisplay' was built under R version 4.3.3

## Loading required package: foreign
## Loading required package: survival
##
## Attaching package: 'survival'
##
## The following object is masked from 'package:caret':
##
##     cluster
##
## Loading required package: MASS
##
## Attaching package: 'MASS'
##
## The following object is masked from 'package:gtsummary':
##
##     select
##
## The following object is masked from 'package:dplyr':
```

```
##
##     select
##
## Loading required package: nnet
##
## Attaching package: 'epiDisplay'
##
## The following object is masked from 'package:lattice':
##
##     dotplot
##
## The following objects are masked from 'package:psych':
##
##     alpha, cs, lookup
##
## The following object is masked from 'package:ggplot2':
##
##     alpha
```

```
library(pROC)
```

```
## Type 'citation("pROC")' for a citation.
##
## Attaching package: 'pROC'
##
## The following object is masked from 'package:epiDisplay':
##
##     ci
##
## The following objects are masked from 'package:stats':
##
##     cov, smooth, var
```

```
library(ResourceSelection)
```

```
## Warning: package 'ResourceSelection' was built under R version 4.3.3
```

```
## ResourceSelection 0.3-6   2023-06-27
```

```
library(survey)
```

```
## Warning: package 'survey' was built under R version 4.3.3
```

```
## Loading required package: grid
##
## Attaching package: 'survey'
##
## The following object is masked from 'package:graphics':
##
##     dotchart
```

```r
library(MASS)
library(boot)
```

```
##
## Attaching package: 'boot'
##
## The following object is masked from 'package:survival':
##
##     aml
##
## The following object is masked from 'package:lattice':
##
##     melanoma
##
## The following object is masked from 'package:psych':
##
##     logit
```

```r
library(randomForest)
```

```
## Warning: package 'randomForest' was built under R version 4.3.3
```

```
## randomForest 4.7-1.2
## Type rfNews() to see new features/changes/bug fixes.
##
## Attaching package: 'randomForest'
##
## The following object is masked from 'package:psych':
##
##     outlier
##
## The following object is masked from 'package:dplyr':
##
##     combine
##
## The following object is masked from 'package:ggplot2':
##
##     margin
```

```r
library(e1071) #SVM
```

```
## Warning: package 'e1071' was built under R version 4.3.3
```

```r
library(xgboost)
```

```
## Warning: package 'xgboost' was built under R version 4.3.3
```

```
##
## Attaching package: 'xgboost'
##
## The following object is masked from 'package:dplyr':
##
##     slice
```

Creating analytic dataset, data wrangling and data cleaning

To better understand the data, we can print a few rows, examine its dimensions, inspect the variable types, and perform other exploratory checks.

To examine how demographic and clinical characteristics compares between different food insecurity groups, we summarize all data by food insecurity categories. Continuous variables were summarized using median (interquartile range), and categorical variables using frequency (percentages). The variables were compared using the Wilcoxon rank-sum test if the variables were continuous, and hi-square or Fisher's exact test if the variables were categorical. We used the "gtsummary" package to perform these analyses.

```
############################################################
# Create analytic dataset, data wrangling and data cleaning
############################################################

# STEP 1. Import data ----------------------------------------------
setwd("C:/Users/ShahS/OneDrive/EDX.ORG/DataScienceCertificate/CAPSTONE/Choose_own_proj")
nha<-read_sas("nha18_20_v3.sas7bdat")
names(nha)<-tolower(names(nha))

#inspecting data elements, sample data
head(nha)
```

```
## # A tibble: 6 x 78
##    year serial strata   psu nhishid   hhweight region pernum nhispid hhx   fmx
##   <dbl>  <dbl>  <dbl> <dbl> <chr>        <dbl>  <dbl>  <dbl> <chr>   <chr> <chr>
## 1  2018      1   7103    19 00002018~     3338      3      1 002018~ " 00~ 01
## 2  2018      3   7137    38 00002018~     5188      2      1 002018~ " 00~ 01
## 3  2018      3   7137    38 00002018~     5188      2      2 002018~ " 00~ 01
## 4  2018      4   7106    22 00002018~     5259      3      1 002018~ " 00~ 01
## 5  2018      4   7106    22 00002018~     5259      3      2 002018~ " 00~ 01
## 6  2018      5   7117    25 00002018~     3204      2      1 002018~ " 00~ 01
## # i 67 more variables: px <chr>, perweight <dbl>, sampweight <dbl>,
## #   longweight <dbl>, partweight <dbl>, fweight <dbl>, astatflg <dbl>,
## #   cstatflg <dbl>, age <dbl>, sex <dbl>, racenew <dbl>, hispeth <dbl>,
## #   gotstampfam <dbl>, poverty <dbl>, fsrawscore <dbl>, fsstatdet <dbl>,
## #   health <dbl>, weight <dbl>, bmicat <dbl>, hiprivate <dbl>, histate <dbl>,
## #   hichip <dbl>, himcaid <dbl>, himcare <dbl>, hiothgov <dbl>, hinone <dbl>,
## #   cnbres <dbl>, cncerv <dbl>, cncoln <dbl>, cnpros <dbl>, bsthev <dbl>, ...
```

```
names(nha)
```

```
##  [1] "year"              "serial"            "strata"
##  [4] "psu"               "nhishid"           "hhweight"
##  [7] "region"            "pernum"            "nhispid"
## [10] "hhx"               "fmx"               "px"
## [13] "perweight"         "sampweight"        "longweight"
## [16] "partweight"        "fweight"           "astatflg"
## [19] "cstatflg"          "age"               "sex"
## [22] "racenew"           "hispeth"           "gotstampfam"
## [25] "poverty"           "fsrawscore"        "fsstatdet"
## [28] "health"            "weight"            "bmicat"
## [31] "hiprivate"         "histate"           "hichip"
## [34] "himcaid"           "himcare"           "hiothgov"
```

```
## [37] "hinone"              "cnbres"              "cncerv"
## [40] "cncoln"              "cnpros"              "bsthev"
## [43] "colgev"              "colsigev"            "mamev"
## [46] "crvtstev"            "papev"               "psaev"
## [49] "food_insecure"       "food_insecure_r"     "female"
## [52] "racenew_r"           "white"               "black"
## [55] "asian"               "other_race"          "hispanic"
## [58] "foodstamp"           "food_security_score" "private_ins"
## [61] "state_ins"           "chi_ins"             "medicaid"
## [64] "medicare"            "other_gov_ins"       "no_ins"
## [67] "insurance"           "blood_stool_test"    "cologuard"
## [70] "colonscopy"          "colon_scr"           "mammogram"
## [73] "pap_test"            "cervc_test"          "cervical_scr"
## [76] "prostate_scr"        "health_r"            "poverty_r"
```

```
str(nha)
```

```
## tibble [176,562 x 78] (S3: tbl_df/tbl/data.frame)
##  $ year               : num [1:176562] 2018 2018 2018 2018 2018 ...
##   ..- attr(*, "label")= chr "Survey year"
##  $ serial             : num [1:176562] 1 3 3 4 4 5 5 6 7 7 ...
##   ..- attr(*, "label")= chr "Sequential Serial Number, Household Record"
##  $ strata             : num [1:176562] 7103 7137 7137 7106 7106 ...
##   ..- attr(*, "label")= chr "Stratum for variance estimation"
##  $ psu                : num [1:176562] 19 38 38 22 22 25 25 34 152 152 ...
##   ..- attr(*, "label")= chr "Primary sampling unit (PSU) for variance estimation"
##  $ nhishid            : chr [1:176562] "00002018000001" "00002018000004" "00002018000004" "000020180
##   ..- attr(*, "label")= chr "NHIS Unique identifier, household"
##  $ hhweight           : num [1:176562] 3338 5188 5188 5259 5259 ...
##   ..- attr(*, "label")= chr "Household weight, final annual"
##  $ region             : num [1:176562] 3 2 2 3 3 2 2 3 1 1 ...
##   ..- attr(*, "label")= chr "Region of residence"
##  $ pernum             : num [1:176562] 1 1 2 1 2 1 2 1 1 2 ...
##   ..- attr(*, "label")= chr "Person number within family/household (from reformatting)"
##  $ nhispid            : chr [1:176562] "0020180000010101" "0020180000040101" "0020180000040102" "002
##   ..- attr(*, "label")= chr "NHIS Unique Identifier, person"
##  $ hhx                : chr [1:176562] " 000001" " 000004" " 000004" " 000006" ...
##   ..- attr(*, "label")= chr "Household number (from NHIS)"
##  $ fmx                : chr [1:176562] "01" "01" "01" "01" ...
##   ..- attr(*, "label")= chr "Family number (from NHIS)"
##  $ px                 : chr [1:176562] "01" "01" "02" "01" ...
##   ..- attr(*, "label")= chr "Person number of respondent (from NHIS)"
##  $ perweight          : num [1:176562] 3539 5656 5848 6009 5738 ...
##   ..- attr(*, "label")= chr "Final basic annual weight"
##  $ sampweight         : num [1:176562] 3915 0 0 16978 0 ...
##   ..- attr(*, "label")= chr "Sample Person Weight"
##  $ longweight         : num [1:176562] NA NA NA NA NA NA NA NA NA NA ...
##   ..- attr(*, "label")= chr "Sample adult weight, longitudinal sample"
##  $ partweight         : num [1:176562] NA NA NA NA NA NA NA NA NA NA ...
##   ..- attr(*, "label")= chr "Sample adult weight, partial sample"
##  $ fweight            : num [1:176562] 3539 5656 5656 5415 5415 ...
##   ..- attr(*, "label")= chr "Final annual family weight"
##  $ astatflg           : num [1:176562] 1 3 2 1 3 1 3 1 1 3 ...
##   ..- attr(*, "label")= chr "Sample adult flag"
```

```
##  $ cstatflg           : num [1:176562] 0 0 0 0 0 0 0 0 0 0 ...
##   ..- attr(*, "label")= chr "Sample child flag"
##  $ age                : num [1:176562] 79 55 49 37 36 29 34 75 39 33 ...
##   ..- attr(*, "label")= chr "Age"
##  $ sex                : num [1:176562] 2 2 1 1 2 1 2 1 1 2 ...
##   ..- attr(*, "label")= chr "Sex"
##  $ racenew            : num [1:176562] 100 100 100 100 100 100 100 400 100 100 ...
##   ..- attr(*, "label")= chr "Self-reported Race (Post-1997 OMB standards)"
##  $ hispeth            : num [1:176562] 10 10 10 10 10 10 10 10 10 10 ...
##   ..- attr(*, "label")= chr "Hispanic ethnicity"
##  $ gotstampfam        : num [1:176562] 10 10 10 10 10 10 10 21 10 10 ...
##   ..- attr(*, "label")= chr "Any family member received food stamp/SNAP benefits last calendar year"
##  $ poverty            : num [1:176562] 22 24 24 37 37 36 36 22 34 34 ...
##   ..- attr(*, "label")= chr "Ratio of family income to poverty threshold"
##  $ fsrawscore         : num [1:176562] 0 2 2 0 0 0 0 8 0 0 ...
##   ..- attr(*, "label")= chr "Family's raw score on the 30-day food security scale"
##  $ fsstatdet          : num [1:176562] 1 2 2 1 1 1 1 4 1 1 ...
##   ..- attr(*, "label")= chr "Detailed family-level food security status on the 30-day food security s
##  $ health             : num [1:176562] 3 3 3 3 2 2 1 5 2 2 ...
##   ..- attr(*, "label")= chr "Health status"
##  $ weight             : num [1:176562] 129 0 0 235 0 996 0 138 170 0 ...
##   ..- attr(*, "label")= chr "Weight in pounds without shoes"
##  $ bmicat             : num [1:176562] 2 NA NA 4 NA 4 NA 2 2 NA ...
##   ..- attr(*, "label")= chr "Categorical body mass index"
##  $ hiprivate          : num [1:176562] 1 2 2 2 2 2 2 2 2 2 ...
##   ..- attr(*, "label")= chr "Has any private health insurance"
##  $ histate            : num [1:176562] 1 1 1 1 1 1 1 1 1 1 ...
##   ..- attr(*, "label")= chr "Has state-sponsored health plan insurance"
##  $ hichip             : num [1:176562] 1 1 1 1 1 1 1 1 1 1 ...
##   ..- attr(*, "label")= chr "Has Children's Health Insurance Program"
##  $ himcaid            : num [1:176562] 1 1 1 1 1 1 1 1 1 1 ...
##   ..- attr(*, "label")= chr "Has Medicaid insurance"
##  $ himcare            : num [1:176562] 2 1 1 1 1 1 1 1 1 1 ...
##   ..- attr(*, "label")= chr "Has Medicare insurance"
##  $ hiothgov           : num [1:176562] 1 1 1 1 1 1 1 1 1 1 ...
##   ..- attr(*, "label")= chr "Has other government program insurance"
##  $ hinone             : num [1:176562] 1 1 1 1 1 1 1 1 1 1 ...
##   ..- attr(*, "label")= chr "Has no health insurance"
##  $ cnbres             : num [1:176562] 0 0 0 1 0 0 0 0 0 0 ...
##   ..- attr(*, "label")= chr "Ever had cancer: Breast"
##  $ cncerv             : num [1:176562] 0 0 0 0 0 0 0 0 0 0 ...
##   ..- attr(*, "label")= chr "Ever had cancer: Cervix"
##  $ cncoln             : num [1:176562] 0 0 0 1 0 0 0 0 0 0 ...
##   ..- attr(*, "label")= chr "Ever had cancer: Colon"
##  $ cnpros             : num [1:176562] 0 0 0 1 0 0 0 0 0 0 ...
##   ..- attr(*, "label")= chr "Ever had cancer: Prostate"
##  $ bsthev             : num [1:176562] 1 0 0 0 0 0 0 2 0 0 ...
##   ..- attr(*, "label")= chr "Ever had blood stool test using home test kit"
##  $ colgev             : num [1:176562] 1 0 0 0 0 0 0 1 0 0 ...
##   ..- attr(*, "label")= chr "Ever had Cologuard test"
##  $ colsigev           : num [1:176562] 1 0 0 0 0 0 0 1 0 0 ...
##   ..- attr(*, "label")= chr "Ever had colonoscopy, sigmoidoscopy, or both"
##  $ mamev              : num [1:176562] 2 0 0 0 0 0 0 0 0 0 ...
##   ..- attr(*, "label")= chr "Ever had a mammogram"
```

```
##  $ crvtstev           : num [1:176562] NA NA NA NA NA NA NA NA NA NA ...
##   ..- attr(*, "label")= chr "Ever had cervical cancer test"
##  $ papev              : num [1:176562] 2 0 0 0 0 0 0 0 0 0 ...
##   ..- attr(*, "label")= chr "Ever had Pap smear test"
##  $ psaev              : num [1:176562] 0 0 0 0 0 0 0 1 0 0 ...
##   ..- attr(*, "label")= chr "Ever had a PSA test"
##  $ food_insecure      : num [1:176562] 0 1 1 0 0 0 0 1 0 0 ...
##  $ food_insecure_r    : num [1:176562] 1 2 2 1 1 1 1 3 1 1 ...
##  $ female             : num [1:176562] 1 1 0 0 1 0 1 0 0 1 ...
##  $ racenew_r          : chr [1:176562] "White" "White" "White" "White" ...
##  $ white              : num [1:176562] 1 1 1 1 1 1 1 0 1 1 ...
##  $ black              : num [1:176562] 0 0 0 0 0 0 0 0 0 0 ...
##  $ asian              : num [1:176562] 0 0 0 0 0 0 0 1 0 0 ...
##  $ other_race         : num [1:176562] 0 0 0 0 0 0 0 0 0 0 ...
##  $ hispanic           : num [1:176562] 0 0 0 0 0 0 0 0 0 0 ...
##  $ foodstamp          : num [1:176562] 0 0 0 0 0 0 0 1 0 0 ...
##  $ food_security_score: num [1:176562] 0 2 2 0 0 0 0 8 0 0 ...
##  $ private_ins        : num [1:176562] 0 1 1 1 1 1 1 1 1 1 ...
##  $ state_ins          : num [1:176562] 0 0 0 0 0 0 0 0 0 0 ...
##  $ chi_ins            : num [1:176562] 0 0 0 0 0 0 0 0 0 0 ...
##  $ medicaid           : num [1:176562] 0 0 0 0 0 0 0 0 0 0 ...
##  $ medicare           : num [1:176562] 1 0 0 0 0 0 0 0 0 0 ...
##  $ other_gov_ins      : num [1:176562] 0 0 0 0 0 0 0 0 0 0 ...
##  $ no_ins             : num [1:176562] 0 0 0 0 0 0 0 0 0 0 ...
##  $ insurance          : num [1:176562] 2 1 1 1 1 1 1 1 1 1 ...
##  $ blood_stool_test   : num [1:176562] 0 NA NA NA NA NA NA 1 NA NA ...
##  $ cologuard          : num [1:176562] 0 NA NA NA NA NA NA 0 NA NA ...
##  $ colonscopy         : num [1:176562] 1 NA NA NA NA NA NA 1 NA NA ...
##  $ colon_scr          : num [1:176562] 1 NA NA NA NA NA NA 1 NA NA ...
##  $ mammogram          : num [1:176562] 1 NA NA NA NA NA NA NA NA NA ...
##  $ pap_test           : num [1:176562] 1 NA NA NA NA NA NA NA NA NA ...
##  $ cervc_test         : num [1:176562] NA NA NA NA NA NA NA NA NA NA ...
##  $ cervical_scr       : num [1:176562] 1 NA NA NA NA NA NA NA NA NA ...
##  $ prostate_scr       : num [1:176562] NA NA NA NA NA NA NA 0 NA NA ...
##  $ health_r           : chr [1:176562] "Good" "Good" "Good" "Good" ...
##  $ poverty_r          : chr [1:176562] "1-1.99" "1-1.99" "1-1.99" ">=5" ...
```

```r
#recoding missing values to NA
nha1<-nha%>%
  dplyr:: mutate(
    racenew_r1=ifelse(racenew_r=='', NA, racenew_r),
    health_r1=ifelse(health_r=='', NA, health_r),
    bmicat=ifelse(bmicat=='', NA, bmicat),
    poverty_r=ifelse(poverty_r=='', NA, poverty_r)
  )

#selecting appropriate variables for the summary table
nha2<- nha1%>%dplyr::select(food_insecure, food_insecure_r, year, age, bmicat, female, racenew_r1, whit


#Summary of demographics and clinical characteristics by group
nha2%>%
  tbl_summary(by = food_insecure_r, missing = "no") %>%
  add_p(pvalue_fun = ~style_pvalue(.x, digits = 3)) %>%
```

```
  add_overall() %>%
  add_n() %>%
  bold_labels()
```

```
## 207 missing rows in the "food_insecure_r" column have been removed.
```

dataset creation for model building

We decided to predict "colon cancer screening" using relevant clinical features and different modeling approach. Fist we need to create a complete case dataset using the clinically relevant features.

```
# Select variables for colon cancer screening
nha3 <- nha2 %>%
  dplyr::select(
    food_insecure_r, year, age, bmicat, female, racenew_r1, insurance, poverty_r, colon_scr
  )

# Ensure variables are factors
factor_vars <- c("food_insecure_r", "racenew_r1", "female", "insurance", "bmicat", "poverty_r")
nha3[factor_vars] <- lapply(nha3[factor_vars], factor)

# Relevel factors
nha3$food_insecure_r <- relevel(nha3$food_insecure_r, ref = "1")
nha3$racenew_r1 <- relevel(nha3$racenew_r1, ref = "White")
nha3$female <- relevel(nha3$female, ref = "0")
nha3$insurance <- relevel(nha3$insurance, ref = "1")
nha3$bmicat <- relevel(nha3$bmicat, ref = "2")
nha3$poverty_r <- relevel(nha3$poverty_r, ref = "<1")

# Remove rows with missing values, N=48676
nha3_colon_c <- nha3[complete.cases(nha3), ]
```

###Model1. Logistic Regression##

First, we tried simpler Logistic Regression Model to predict colon cancer screening.

```
model_colon=glm(colon_scr~as.factor(food_insecure_r)+age+as.factor(bmicat)+as.factor(female)+as.factor(
                  as.factor(poverty_r)+as.factor(insurance), family=binomial(link=logit),  data = nha3_


summary(model_colon)
```

```
##
## Call:
## glm(formula = colon_scr ~ as.factor(food_insecure_r) + age +
##     as.factor(bmicat) + as.factor(female) + as.factor(racenew_r1) +
##     as.factor(poverty_r) + as.factor(insurance), family = binomial(link = logit),
##     data = nha3_colon_c)
##
## Coefficients:
##                               Estimate Std. Error z value Pr(>|z|)
```

```
## (Intercept)                 -5.289979   0.087659 -60.347  < 2e-16 ***
## as.factor(food_insecure_r)2 -0.034279   0.056133  -0.611 0.541412
## as.factor(food_insecure_r)3  0.256745   0.048767   5.265  1.4e-07 ***
## age                          0.099403   0.001259  78.977  < 2e-16 ***
## as.factor(bmicat)1          -0.396075   0.104218  -3.800 0.000144 ***
## as.factor(bmicat)3           0.082349   0.030392   2.710 0.006738 **
## as.factor(bmicat)4           0.257374   0.030979   8.308  < 2e-16 ***
## as.factor(female)1           0.064907   0.024376   2.663 0.007752 **
## as.factor(racenew_r1)Asian  -0.463466   0.051730  -8.959  < 2e-16 ***
## as.factor(racenew_r1)Black   0.089330   0.038092   2.345 0.019022 *
## as.factor(racenew_r1)Other  -0.051246   0.069117  -0.741 0.458427
## as.factor(poverty_r)>=5      0.803749   0.049604  16.203  < 2e-16 ***
## as.factor(poverty_r)1-1.99   0.020564   0.047564   0.432 0.665497
## as.factor(poverty_r)2-4.99   0.404282   0.046040   8.781  < 2e-16 ***
## as.factor(insurance)2       -0.047510   0.032846  -1.446 0.148053
## as.factor(insurance)3       -0.584736   0.042299 -13.824  < 2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## (Dispersion parameter for binomial family taken to be 1)
##
##     Null deviance: 54037  on 48675  degrees of freedom
## Residual deviance: 43533  on 48660  degrees of freedom
## AIC: 43565
##
## Number of Fisher Scoring iterations: 5
```

```
# Predict probabilities for each observation
predicted_probs <- predict(model_colon, nha3_colon_c, type = "response")
# Calculate AUC--model discrimination
roc_obj_logit<-roc(nha3_colon_c$colon_scr, predicted_probs)
```

```
## Setting levels: control = 0, case = 1
```

```
## Setting direction: controls < cases
```

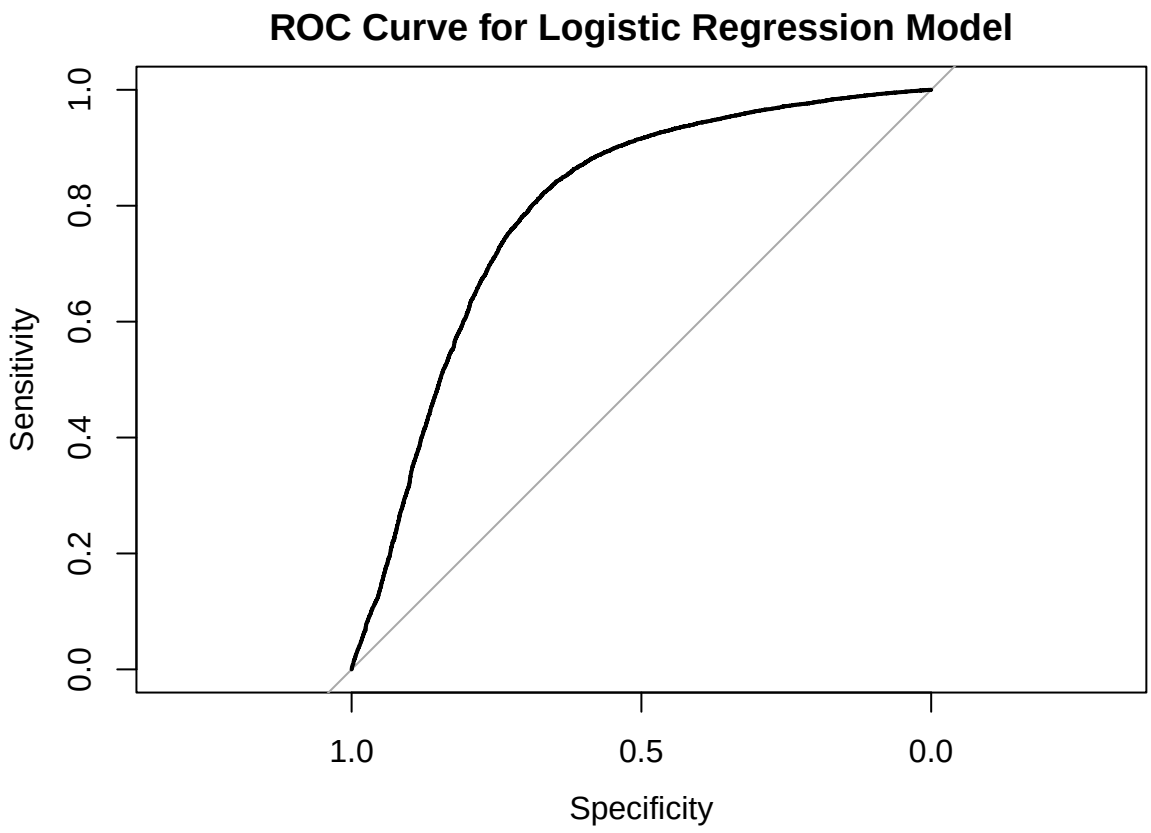
```
auc_logistic <-as.numeric(roc(nha3_colon_c$colon_scr, predicted_probs)$auc)
```

```
## Setting levels: control = 0, case = 1
## Setting direction: controls < cases
```

```
auc_logistic
```

```
## [1] 0.7918455
```

```
plot(roc_obj_logit, main = "ROC Curve for Logistic Regression Model")
```




```
#goodness of fit test for logistic regression
complete_cases <- complete.cases(nha3_colon_c$colon_scr, predicted_probs)
observed <- nha3_colon_c$colon_scr[complete_cases]
predicted_probs <- predicted_probs[complete_cases]
hoslem.test(observed, predicted_probs, g=10)
```

```
##
##  Hosmer and Lemeshow goodness of fit (GOF) test
##
## data:  observed, predicted_probs
## X-squared = 1554.2, df = 8, p-value < 2.2e-16
```

```
#Confusion Matrix and Accuracy:
predicted_probs1 <- predict(model_colon, nha3_colon_c, type = "response")
predicted <- ifelse(predicted_probs1 > 0.5, 1, 0)
conf_matrix <- table(predicted, nha3_colon_c$colon_scr)
accuracy <- sum(diag(conf_matrix)) / sum(conf_matrix)
sensitivity <- conf_matrix[2, 2] / sum(conf_matrix[2, ])
specificity <- conf_matrix[1, 1] / sum(conf_matrix[1, ])
accuracy
```

```
## [1] 0.8108924
```

```r
sensitivity
```

```
## [1] 0.8317757
```

```r
specificity
```

```
## [1] 0.6876506
```

```r
###cross validation using caret package for logistic regression model

# Convert the outcome of interest "colon_scr" var to a factor with valid levels
#for cross validation using caret package
nha3_colon_c$colon_scr_r <- factor(
  nha3_colon_c$colon_scr,
  levels = c(0, 1),           # Ensure correct levels
  labels = c("No", "Yes")     # Use valid string labels
)


# Define the cross-validation setup--we will use this setup for all subsequent models for cross-validat
train_control <- trainControl(
  method = "cv",
  number = 10,
  summaryFunction = twoClassSummary,
  classProbs = TRUE  # Enables probability predictions
)

######cross validation for Logistic Regression model####################
cv_model <- train(
  colon_scr_r ~ as.factor(food_insecure_r) + age + as.factor(bmicat) +
    as.factor(female) + as.factor(racenew_r1) +
    as.factor(poverty_r) + as.factor(insurance),
  data = nha3_colon_c,
  method = "glm",
  family = "binomial",  # Specify logistic regression
  trControl = train_control,
  metric = "ROC"  # Use ROC as the evaluation metric
)

# Print the model summary
print(cv_model)
```

```
## Generalized Linear Model
##
## 48676 samples
##     7 predictor
##     2 classes: 'No', 'Yes'
##
## No pre-processing
## Resampling: Cross-Validated (10 fold)
## Summary of sample sizes: 43808, 43808, 43809, 43809, 43808, 43809, ...
## Resampling results:
```

```
##
##   ROC       Sens       Spec
##   0.791549  0.4092125  0.9404739
```

```
summary(cv_model)
```

```
##
## Call:
## NULL
##
## Coefficients:
##                               Estimate Std. Error z value Pr(>|z|)
## (Intercept)                  -5.289979   0.087659 -60.347  < 2e-16 ***
## `as.factor(food_insecure_r)2` -0.034279   0.056133  -0.611 0.541412
## `as.factor(food_insecure_r)3`  0.256745   0.048767   5.265  1.4e-07 ***
## age                            0.099403   0.001259  78.977  < 2e-16 ***
## `as.factor(bmicat)1`          -0.396075   0.104218  -3.800 0.000144 ***
## `as.factor(bmicat)3`           0.082349   0.030392   2.710 0.006738 **
## `as.factor(bmicat)4`           0.257374   0.030979   8.308  < 2e-16 ***
## `as.factor(female)1`           0.064907   0.024376   2.663 0.007752 **
## `as.factor(racenew_r1)Asian`  -0.463466   0.051730  -8.959  < 2e-16 ***
## `as.factor(racenew_r1)Black`   0.089330   0.038092   2.345 0.019022 *
## `as.factor(racenew_r1)Other`  -0.051246   0.069117  -0.741 0.458427
## `as.factor(poverty_r)>=5`      0.803749   0.049604  16.203  < 2e-16 ***
## `as.factor(poverty_r)1-1.99`   0.020564   0.047564   0.432 0.665497
## `as.factor(poverty_r)2-4.99`   0.404282   0.046040   8.781  < 2e-16 ***
## `as.factor(insurance)2`       -0.047510   0.032846  -1.446 0.148053
## `as.factor(insurance)3`       -0.584736   0.042299 -13.824  < 2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## (Dispersion parameter for binomial family taken to be 1)
##
##     Null deviance: 54037  on 48675  degrees of freedom
## Residual deviance: 43533  on 48660  degrees of freedom
## AIC: 43565
##
## Number of Fisher Scoring iterations: 5
```

```
extract_auc_logistic=as.data.frame(cv_model$resample)
auc_logistic_xvalidated<-as.numeric(mean(extract_auc_logistic$ROC), na.rm=TRUE)

#saving AUC estimates in a dataframe
auc_table <- as.data.frame(tibble(Model ="Logistic Regression model",
                                  AUC_single_model=auc_logistic, AUC_10F_xvalidated = auc_logistic_xvali
auc_table %>% knitr::kable()
```

Model	AUC_single_model	AUC_10F_xvalidated
Logistic Regression model	0.7918455	0.791549

```
auc_table
```

```
##                       Model AUC_single_model AUC_10F_xvalidated
## 1 Logistic Regression model        0.7918455           0.791549
```

Model2. Random Forest Model

We then implemented Random Forest Model to predict colon cancer screening.

```
nha3_colon_c$colon_scr <- as.factor(nha3_colon_c$colon_scr)

# Fit a random forest model
model_rf <- randomForest(colon_scr_r ~ food_insecure_r + age +bmicat +
              female + racenew_r1 +poverty_r + insurance, data = nha3_colon_c,
              ntree = 100, importance = TRUE)


# View model summary
print(model_rf)
```

```
##
## Call:
##  randomForest(formula = colon_scr_r ~ food_insecure_r + age +      bmicat + female + racenew_r1 + po
##                Type of random forest: classification
##                      Number of trees: 100
## No. of variables tried at each split: 2
##
##         OOB estimate of  error rate: 17.79%
## Confusion matrix:
##       No   Yes class.error
## No  6190  5662  0.47772528
## Yes 2997 33827  0.08138714
```

```
# Feature importance
importance(model_rf)
```

```
##                        No       Yes MeanDecreaseAccuracy MeanDecreaseGini
## food_insecure_r  2.0679647  7.718655             8.863877        131.87823
## age             62.5411473 56.688409            63.813348       4504.67864
## bmicat          -2.7383763  9.422010             8.609955        188.11888
## female           3.2801213  4.589399             6.523065         76.85793
## racenew_r1       0.2420003  6.569755             5.331814        201.78889
## poverty_r        8.3163804  6.083922            16.620182        266.09096
## insurance        8.9919493  6.841323            20.996893        411.32422
```

```
# Predict probabilities
pred_probs <- predict(model_rf, nha3_colon_c, type = "prob")[, 2]  # Probability of class 1
# Compute AUC
roc_obj_rf <- roc(nha3_colon_c$colon_scr, pred_probs)
```

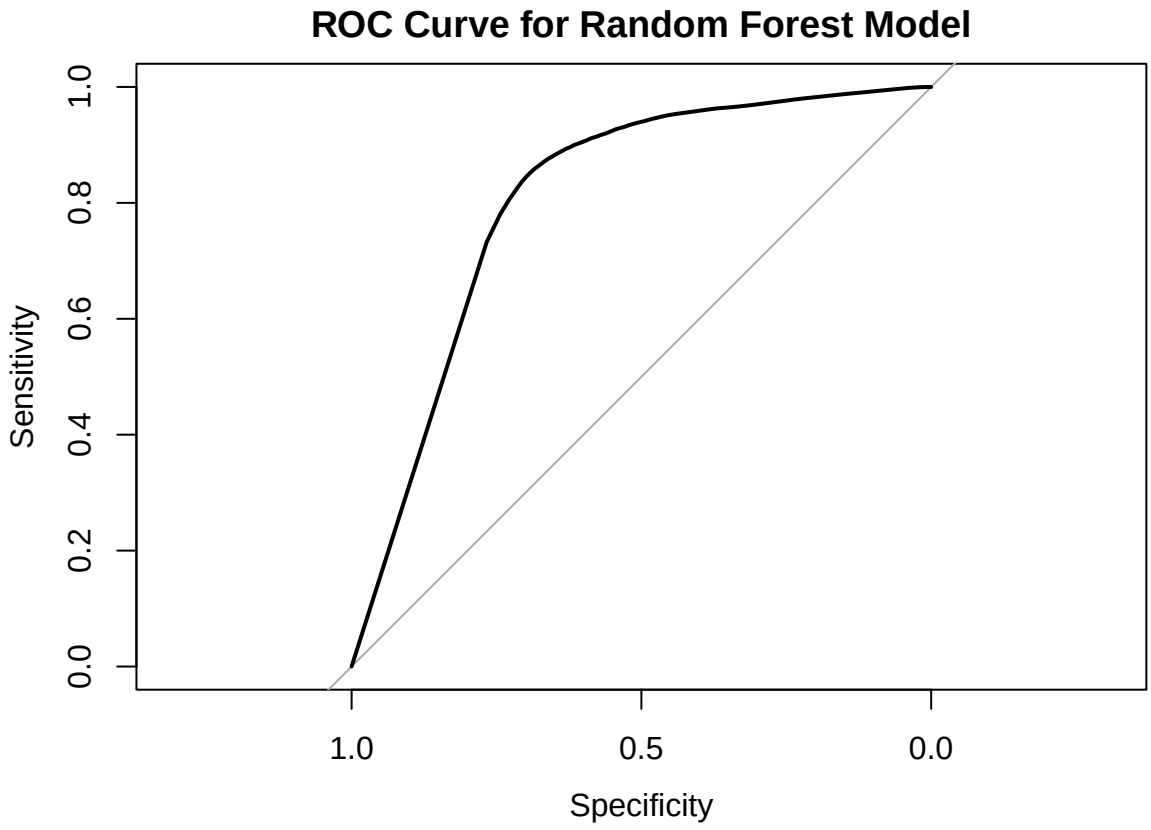
```
## Setting levels: control = 0, case = 1
```

```
## Setting direction: controls < cases
```

```
auc_rf <- auc(roc_obj_rf)
print(auc_rf)
```

```
## Area under the curve: 0.8065
```

```
plot(roc_obj_rf, main = "ROC Curve for Random Forest Model")
```




```
######cross validation for random forest model####################

# Train the random forest model using caret
cv_model_rf <- train(
  colon_scr_r ~ food_insecure_r + age + bmicat +
    female + racenew_r1 +
    poverty_r + insurance,
  data = nha3_colon_c,
  method = "rf",            # Specify Random Forest as the model
  trControl = train_control,  # Use cross-validation setup that was previously defined (see above)
  metric = "ROC",           # Optimize based on ROC AUC
  ntree = 100,              # Number of trees
  importance = TRUE         # Track variable importance
)
```

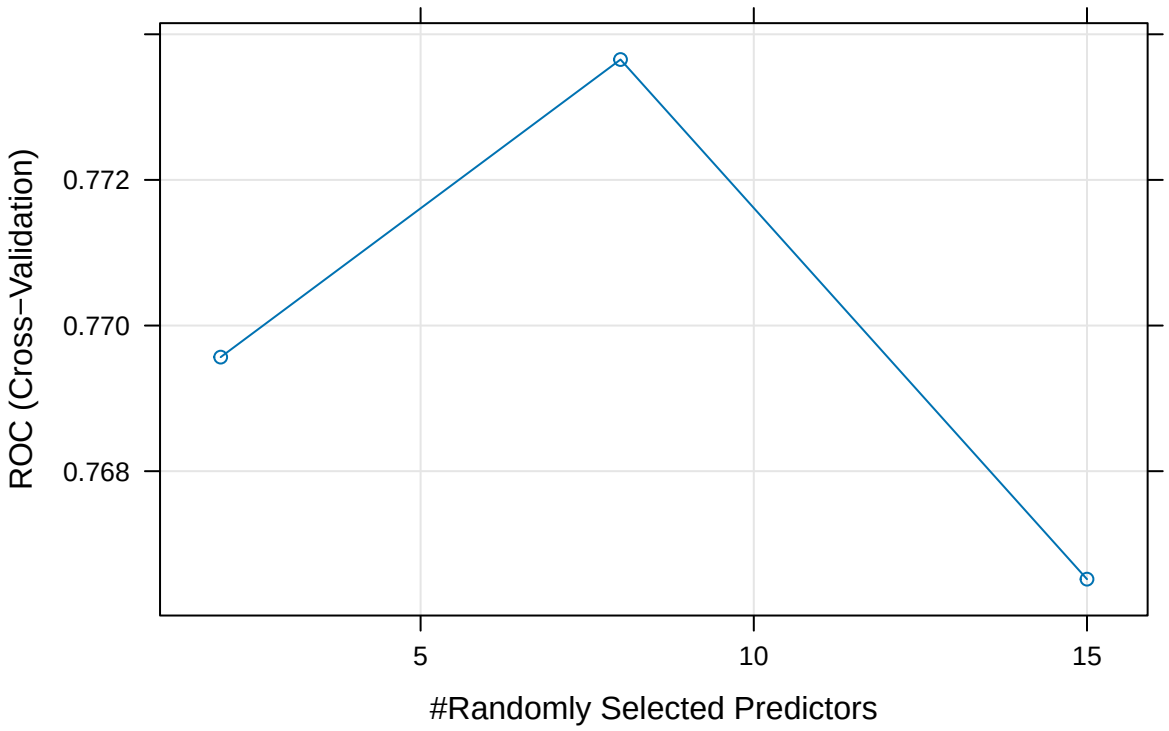
```r
# Print the model summary and plot
print(cv_model_rf)
```

```
## Random Forest
##
## 48676 samples
##     7 predictor
##     2 classes: 'No', 'Yes'
##
## No pre-processing
## Resampling: Cross-Validated (10 fold)
## Summary of sample sizes: 43808, 43808, 43808, 43809, 43809, 43808, ...
## Resampling results across tuning parameters:
##
##   mtry  ROC        Sens       Spec
##    2    0.7695661  0.4924013  0.9267047
##    8    0.7736533  0.5080158  0.9103571
##   15    0.7665172  0.5084372  0.8950682
##
## ROC was used to select the optimal model using the largest value.
## The final value used for the model was mtry = 8.
```

```r
summary(cv_model_rf)
```

```
##                 Length Class      Mode
## call               6   -none-     call
## type               1   -none-     character
## predicted      48676   factor     numeric
## err.rate         300   -none-     numeric
## confusion          6   -none-     numeric
## votes          97352   matrix     numeric
## oob.times      48676   -none-     numeric
## classes            2   -none-     character
## importance        60   -none-     numeric
## importanceSD      45   -none-     numeric
## localImportance    0   -none-     NULL
## proximity          0   -none-     NULL
## ntree              1   -none-     numeric
## mtry               1   -none-     numeric
## forest            14   -none-     list
## y              48676   factor     numeric
## test               0   -none-     NULL
## inbag              0   -none-     NULL
## xNames            15   -none-     character
## problemType        1   -none-     character
## tuneValue          1   data.frame list
## obsLevels          2   -none-     character
## param              2   -none-     list
```

```r
plot(cv_model_rf, main = "Cross-Validated ROC vs. # of predictors")
```




```
extract_auc_rf=as.data.frame(cv_model_rf$resample)
auc_rf_xvalidated<-mean(extract_auc_rf$ROC, na.rm=TRUE)

auc_rf <- as.numeric(auc_rf)
auc_rf_xvalidated <- as.numeric(auc_rf_xvalidated)

#adding AUC to the dataframe
auc_table <- auc_table %>% add_row(Model="Random Forest Model", AUC_single_model=auc_rf,
                                   AUC_10F_xvalidated = auc_rf_xvalidated)
auc_table
```

```
##                        Model AUC_single_model AUC_10F_xvalidated
## 1 Logistic Regression model        0.7918455          0.7915490
## 2       Random Forest Model        0.8064965          0.7736533
```

Model3. Support Vector Machine (SVM) Model

Cross validated AUROC for random forest model was worse than Logistic Regression Model. So, we tested if the Support Vector Machine (SVM) model peform better.

```
model_svm <- svm(colon_scr ~ food_insecure_r + age +bmicat +
                   female + racenew_r1 +
                   poverty_r + insurance,
                 data = nha3_colon_c, kernel = "radial", probability = TRUE)
```

```r
summary(model_svm)
```

```
##
## Call:
## svm(formula = colon_scr ~ food_insecure_r + age + bmicat + female +
##     racenew_r1 + poverty_r + insurance, data = nha3_colon_c, kernel = "radial",
##     probability = TRUE)
##
##
## Parameters:
##    SVM-Type:  C-classification
##  SVM-Kernel:  radial
##        cost:  1
##
## Number of Support Vectors:  19883
##
##  ( 10036 9847 )
##
##
## Number of Classes:  2
##
## Levels:
##  0 1
```

```r
pred <- predict(model_svm, nha3_colon_c, probability = TRUE)
probabilities <- attr(pred, "probabilities")[, 2]  # Probabilities for the positive class
roc_obj_svm <- roc(nha3_colon_c$colon_scr, probabilities)
```

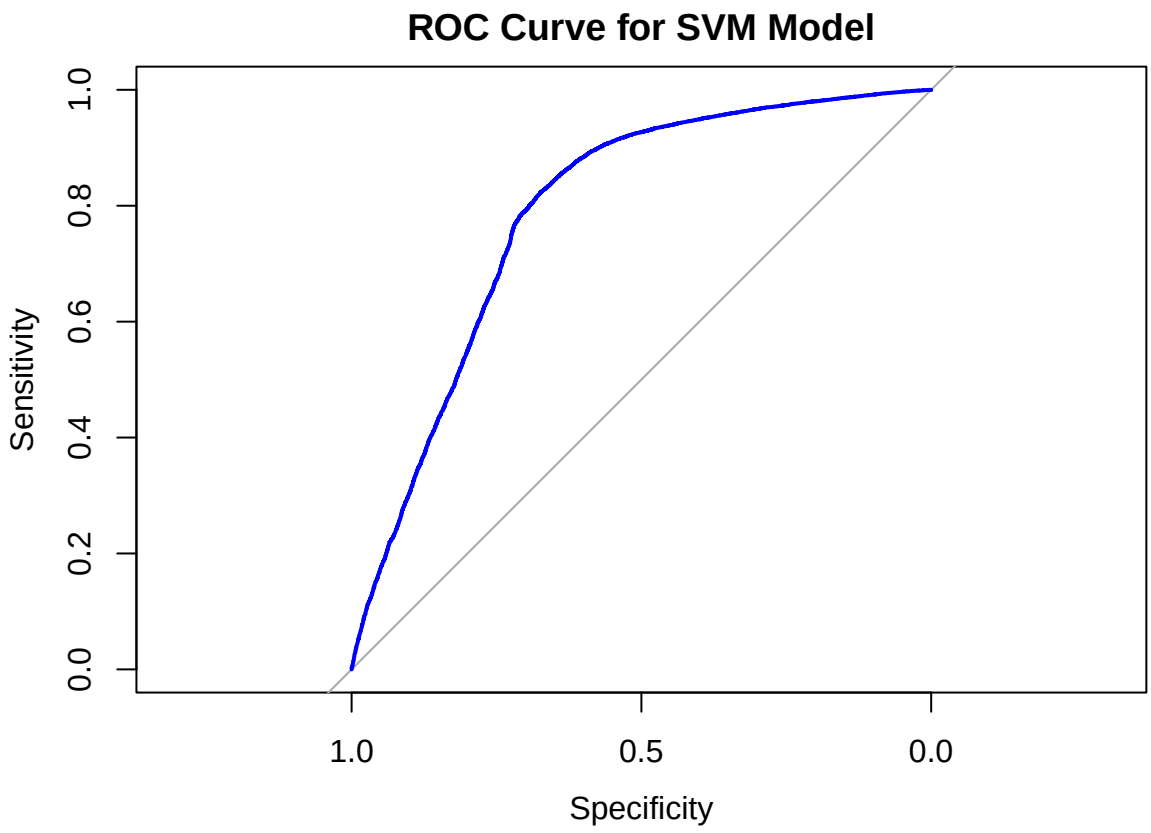
```
## Setting levels: control = 0, case = 1
```

```
## Setting direction: controls > cases
```

```r
auc_value_svm <- as.numeric(auc(roc_obj_svm))
print(auc_value_svm)
```

```
## [1] 0.7880106
```

```r
plot(roc_obj_svm, main = "ROC Curve for SVM Model", col = "blue", lwd = 2)
```




```
######cross validation for support vector machine (SVM) model#####################

# Train the SVM model using caret
cv_model_svm <- train(
  colon_scr_r ~ food_insecure_r + age + bmicat +
    female + racenew_r1 +
    poverty_r + insurance,
  data = nha3_colon_c,
  method = "svmRadial",       # Specify the radial kernel SVM
  trControl = train_control, # Use cross-validation setup
  metric = "ROC",            # Optimize based on ROC AUC
  probability = TRUE         # Enable probability predictions (needed for AUC)
)
```

```
## line search fails -1.716433 0.02871571 1.027305e-05 5.186023e-06 -2.653176e-09 8.363816e-10 -2.29187
```

```
## Warning in method$predict(modelFit = modelFit, newdata = newdata, submodels =
## param): kernlab class prediction calculations failed; returning NAs
```

```
## Warning in method$prob(modelFit = modelFit, newdata = newdata, submodels =
## param): kernlab class probability calculations failed; returning NAs
```

```
## Warning in data.frame(..., check.names = FALSE): row names were found from a
## short variable and have been discarded
```

```
## line search fails -1.710229 0.02103636 1.083968e-05 5.361669e-06 -2.798152e-09 8.898904e-10 -2.55597

## Warning in method$predict(modelFit = modelFit, newdata = newdata, submodels =
## param): kernlab class prediction calculations failed; returning NAs

## Warning in method$prob(modelFit = modelFit, newdata = newdata, submodels =
## param): kernlab class probability calculations failed; returning NAs

## Warning in data.frame(..., check.names = FALSE): row names were found from a
## short variable and have been discarded

## line search fails -1.722203 0.03080995 1.072897e-05 5.161338e-06 -2.839234e-09 9.557544e-10 -2.55290

## Warning in method$predict(modelFit = modelFit, newdata = newdata, submodels =
## param): kernlab class prediction calculations failed; returning NAs

## Warning in method$prob(modelFit = modelFit, newdata = newdata, submodels =
## param): kernlab class probability calculations failed; returning NAs

## Warning in data.frame(..., check.names = FALSE): row names were found from a
## short variable and have been discarded

## line search fails -1.716274 0.02991708 1.00915e-05 4.92156e-06 -2.646507e-09 8.792505e-10 -2.237994e

## Warning in method$predict(modelFit = modelFit, newdata = newdata, submodels =
## param): kernlab class prediction calculations failed; returning NAs

## Warning in method$prob(modelFit = modelFit, newdata = newdata, submodels =
## param): kernlab class probability calculations failed; returning NAs

## Warning in data.frame(..., check.names = FALSE): row names were found from a
## short variable and have been discarded

## line search fails -1.715064 0.01894875 1.179297e-05 5.996636e-06 -3.009391e-09 9.068348e-10 -3.00517

## Warning in method$predict(modelFit = modelFit, newdata = newdata, submodels =
## param): kernlab class prediction calculations failed; returning NAs

## Warning in method$prob(modelFit = modelFit, newdata = newdata, submodels =
## param): kernlab class probability calculations failed; returning NAs

## Warning in data.frame(..., check.names = FALSE): row names were found from a
## short variable and have been discarded

## line search fails -1.722878 0.02988081 1.200309e-05 6.221355e-06 -3.050128e-09 9.039943e-10 -3.09869

## Warning in method$predict(modelFit = modelFit, newdata = newdata, submodels =
## param): kernlab class prediction calculations failed; returning NAs
```

```
## Warning in method$prob(modelFit = modelFit, newdata = newdata, submodels =
## param): kernlab class probability calculations failed; returning NAs

## Warning in data.frame(..., check.names = FALSE): row names were found from a
## short variable and have been discarded

## line search fails -1.719029 0.03011231 1.010558e-05 4.853659e-06 -2.677458e-09 9.078303e-10 -2.26509

## Warning in method$predict(modelFit = modelFit, newdata = newdata, submodels =
## param): kernlab class prediction calculations failed; returning NAs

## Warning in method$prob(modelFit = modelFit, newdata = newdata, submodels =
## param): kernlab class probability calculations failed; returning NAs

## Warning in data.frame(..., check.names = FALSE): row names were found from a
## short variable and have been discarded

## Warning in nominalTrainWorkflow(x = x, y = y, wts = weights, info = trainInfo,
## : There were missing values in resampled performance measures.

## line search fails -1.718095 0.02265773 1.107673e-05 5.224213e-06 -2.659414e-09 9.128664e-10 -2.46885
```

```
# Print the model summary
print(cv_model_svm)
```

```
## Support Vector Machines with Radial Basis Function Kernel
##
## 48676 samples
##     7 predictor
##     2 classes: 'No', 'Yes'
##
## No pre-processing
## Resampling: Cross-Validated (10 fold)
## Summary of sample sizes: 43809, 43807, 43809, 43809, 43809, 43807, ...
## Resampling results across tuning parameters:
##
##   C     ROC        Sens       Spec
##   0.25  0.8033707  0.4329512  0.9464205
##   0.50  0.7896869  0.4186619  0.9438407
##   1.00  0.7846907  0.4022931  0.9472082
##
## Tuning parameter 'sigma' was held constant at a value of 0.06345747
## ROC was used to select the optimal model using the largest value.
## The final values used for the model were sigma = 0.06345747 and C = 0.25.
```

```
extract_auc_svm=as.data.frame(cv_model_svm$resample)

extract_auc_svm$ROC=as.numeric(extract_auc_svm$ROC)

auc_svm_xvalidated<-mean(extract_auc_svm$ROC, na.rm=TRUE)
```

```r
#adding AUC to the dataframe
auc_table <- auc_table %>% add_row(Model="Support Vector Machine model", AUC_single_model=auc_value_svm
                                   AUC_10F_xvalidated = auc_svm_xvalidated)
auc_table
```

```
##                           Model AUC_single_model AUC_10F_xvalidated
## 1    Logistic Regression model        0.7918455          0.7915490
## 2          Random Forest Model        0.8064965          0.7736533
## 3 Support Vector Machine model        0.7880106          0.8033707
```

Model4. Gradient Boosting (i.e., XGBoost)

The SVM model performed slightly better than Logistic regression model, and of course better than Random Forest Model. So, we finally built Gradient Boosting Model.

```r
# Prepare data for XGBoost

nha3_colon_c$colon_scr <- as.numeric(as.character(nha3_colon_c$colon_scr))

X <- model.matrix(colon_scr ~ food_insecure_r + age +bmicat +
                    female + racenew_r1 +
                    poverty_r + insurance,
                  data = nha3_colon_c)[,-1]
y <- nha3_colon_c$colon_scr

# Train-test split
set.seed(1157)
train_idx <- sample(1:nrow(nha3_colon_c), 0.8 * nrow(nha3_colon_c))

dtrain <- xgb.DMatrix(data = X[train_idx,], label = y[train_idx])
dtest <- xgb.DMatrix(data = X[-train_idx,], label = y[-train_idx])

# dtrain_labels <- as.numeric(as.factor(your_labels)) - 1
# dtrain <- xgb.DMatrix(data = your_features, label = dtrain_labels)


# Train XGBoost
model_xgb <- xgboost(data = dtrain, objective = "binary:logistic", nrounds = 100)
```

```
## [1]  train-logloss:0.573017
## [2]  train-logloss:0.509275
## [3]  train-logloss:0.472552
## [4]  train-logloss:0.450502
## [5]  train-logloss:0.437280
## [6]  train-logloss:0.429271
## [7]  train-logloss:0.424180
## [8]  train-logloss:0.420818
## [9]  train-logloss:0.418873
## [10] train-logloss:0.417329
## [11] train-logloss:0.416254
## [12] train-logloss:0.415350
## [13] train-logloss:0.414684
```

```
## [14] train-logloss:0.414054
## [15] train-logloss:0.413443
## [16] train-logloss:0.412816
## [17] train-logloss:0.412310
## [18] train-logloss:0.411885
## [19] train-logloss:0.411391
## [20] train-logloss:0.410890
## [21] train-logloss:0.410491
## [22] train-logloss:0.410043
## [23] train-logloss:0.409669
## [24] train-logloss:0.409123
## [25] train-logloss:0.408747
## [26] train-logloss:0.408301
## [27] train-logloss:0.407959
## [28] train-logloss:0.407583
## [29] train-logloss:0.407367
## [30] train-logloss:0.407030
## [31] train-logloss:0.406823
## [32] train-logloss:0.406492
## [33] train-logloss:0.406263
## [34] train-logloss:0.406063
## [35] train-logloss:0.405552
## [36] train-logloss:0.405317
## [37] train-logloss:0.404856
## [38] train-logloss:0.404546
## [39] train-logloss:0.404073
## [40] train-logloss:0.403851
## [41] train-logloss:0.403651
## [42] train-logloss:0.403373
## [43] train-logloss:0.403147
## [44] train-logloss:0.402864
## [45] train-logloss:0.402707
## [46] train-logloss:0.402480
## [47] train-logloss:0.402116
## [48] train-logloss:0.401810
## [49] train-logloss:0.401636
## [50] train-logloss:0.401429
## [51] train-logloss:0.401079
## [52] train-logloss:0.400715
## [53] train-logloss:0.400605
## [54] train-logloss:0.400416
## [55] train-logloss:0.400058
## [56] train-logloss:0.399846
## [57] train-logloss:0.399644
## [58] train-logloss:0.399417
## [59] train-logloss:0.399239
## [60] train-logloss:0.399057
## [61] train-logloss:0.398758
## [62] train-logloss:0.398404
## [63] train-logloss:0.398192
## [64] train-logloss:0.398024
## [65] train-logloss:0.397814
## [66] train-logloss:0.397667
## [67] train-logloss:0.397408
```

```
## [68] train-logloss:0.397176
## [69] train-logloss:0.396986
## [70] train-logloss:0.396818
## [71] train-logloss:0.396727
## [72] train-logloss:0.396575
## [73] train-logloss:0.396241
## [74] train-logloss:0.396044
## [75] train-logloss:0.395763
## [76] train-logloss:0.395476
## [77] train-logloss:0.395257
## [78] train-logloss:0.395024
## [79] train-logloss:0.394780
## [80] train-logloss:0.394631
## [81] train-logloss:0.394288
## [82] train-logloss:0.394170
## [83] train-logloss:0.394001
## [84] train-logloss:0.393866
## [85] train-logloss:0.393712
## [86] train-logloss:0.393463
## [87] train-logloss:0.393303
## [88] train-logloss:0.393102
## [89] train-logloss:0.393014
## [90] train-logloss:0.392891
## [91] train-logloss:0.392794
## [92] train-logloss:0.392579
## [93] train-logloss:0.392360
## [94] train-logloss:0.392196
## [95] train-logloss:0.392095
## [96] train-logloss:0.391964
## [97] train-logloss:0.391880
## [98] train-logloss:0.391759
## [99] train-logloss:0.391686
## [100]    train-logloss:0.391538
```

```
# Predict on test data
preds <- predict(model_xgb, dtest)
# Extract true labels from the DMatrix
true_labels <- getinfo(dtest, "label")

# Compute the ROC curve
roc_obj_xgb <- roc(true_labels, preds)
```

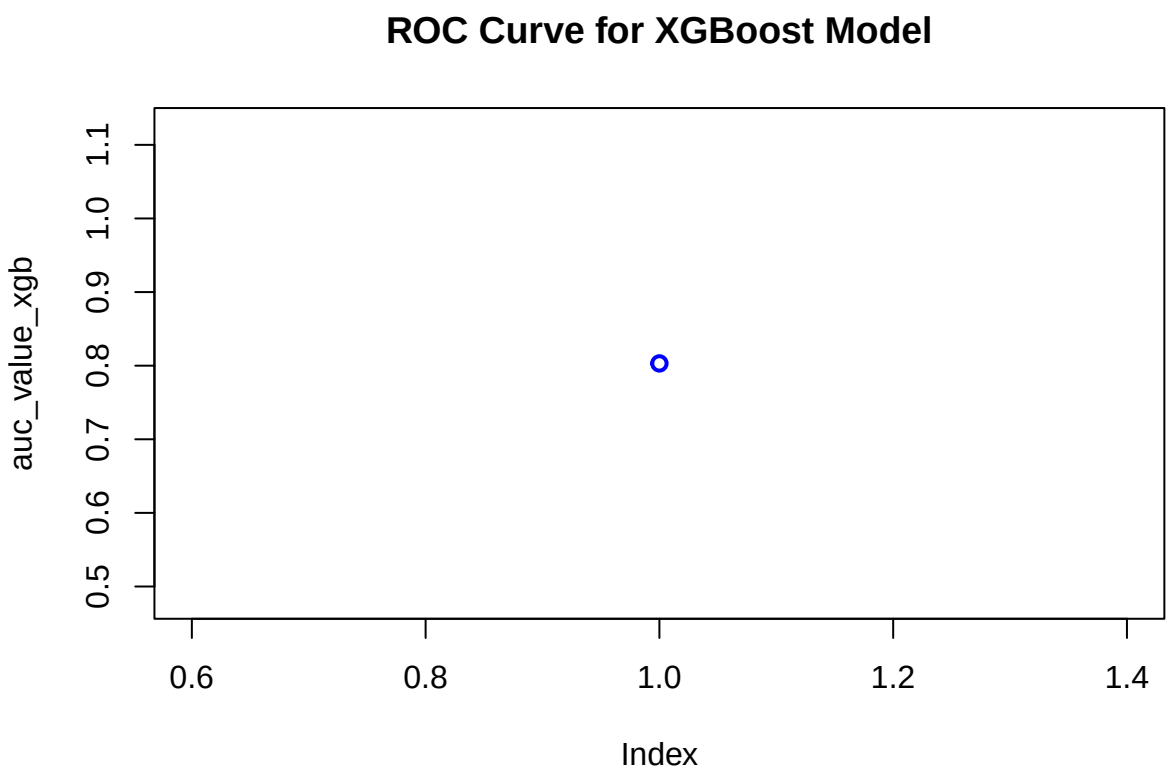
```
## Setting levels: control = 0, case = 1
```

```
## Setting direction: controls < cases
```

```
# Compute the AUC
auc_value_xgb <- as.numeric(auc(roc_obj_xgb))
print(auc_value_xgb)
```

```
## [1] 0.803075
```

```r
# Plot the ROC curve
plot(auc_value_xgb, main = "ROC Curve for XGBoost Model", col = "blue", lwd = 2)
```




```r
######cross validation for XGBoost model####################

# Train the XGBoost model using caret
cv_model_xgb <- train(
  colon_scr_r ~ food_insecure_r + age + bmicat +
    female + racenew_r1 +
    poverty_r + insurance,
  data = nha3_colon_c,
  method = "xgbTree",       # Specify XGBoost as the method
  trControl = train_control, # Use cross-validation setup
  metric = "ROC",           # Optimize based on ROC AUC
  tuneLength = 3            # Test 3 random parameter combinations (optional)
)
```

```
## [04:06:41] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:06:41] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:06:41] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:06:41] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:06:42] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:06:42] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:06:42] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:06:42] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
```

```
## [04:06:43] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:06:43] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:06:43] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:06:43] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:06:44] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:06:44] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:06:44] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:06:44] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:06:44] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:06:44] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:06:44] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:06:44] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:06:45] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:06:45] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:06:45] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:06:45] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:06:46] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:06:46] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:06:46] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:06:46] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:06:48] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:06:48] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:06:48] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:06:48] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:06:49] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:06:49] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:06:49] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:06:49] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:06:50] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:06:50] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:06:50] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:06:50] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:06:51] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:06:51] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:06:51] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:06:51] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:06:52] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:06:52] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:06:52] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:06:52] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:06:54] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:06:54] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:06:54] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:06:54] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:06:56] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:06:56] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:06:56] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:06:56] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:06:57] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:06:57] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:06:57] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:06:57] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:06:59] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:06:59] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
```

```
## [04:06:59] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:06:59] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:00] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:00] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:00] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:00] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:02] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:02] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:02] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:02] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:03] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:03] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:03] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:03] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:04] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:04] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:04] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:04] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:04] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:04] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:04] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:04] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:05] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:05] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:05] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:05] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:07] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:07] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:07] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:07] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:07] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:07] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:07] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:07] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:09] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:09] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:09] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:09] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:10] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:10] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:10] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:10] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:11] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:11] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:11] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:11] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:12] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:12] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:12] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:12] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:13] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:13] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:13] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:13] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
```

```
## [04:07:15] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:15] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:15] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:15] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:16] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:16] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:16] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:16] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:18] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:18] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:18] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:18] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:19] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:19] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:19] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:19] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:21] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:21] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:21] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:21] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:22] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:22] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:22] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:22] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:24] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:24] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:24] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:24] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:25] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:25] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:25] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:25] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:26] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:26] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:26] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:26] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:26] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:26] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:26] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:26] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:27] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:27] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:27] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:27] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:28] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:28] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:28] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:28] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:29] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:29] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:29] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:29] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:30] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:07:30] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
```

```
## [04:07:30] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:30] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:32] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:32] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:32] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:32] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:33] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:33] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:33] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:33] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:34] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:34] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:34] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:34] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:35] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:35] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:35] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:35] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:36] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:36] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:36] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:36] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:38] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:38] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:38] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:38] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:39] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:39] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:39] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:39] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:41] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:41] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:41] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:41] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:42] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:42] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:42] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:42] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:44] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:44] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:44] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:44] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:45] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:45] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:45] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:45] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:46] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:46] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:46] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:46] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:47] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:47] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:47] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:47] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
```

```
## [04:07:48] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:48] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:48] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:48] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:49] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:49] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:49] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:49] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:50] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:50] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:50] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:50] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:51] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:51] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:51] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:51] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:52] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:52] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:52] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:52] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:53] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:53] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:53] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:53] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:54] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:54] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:54] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:54] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:56] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:56] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:56] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:56] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:57] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:57] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:57] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:57] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:58] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:58] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:58] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:58] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:07:59] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:00] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:00] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:00] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:01] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:01] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:01] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:01] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:02] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:02] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:02] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:02] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:04] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:04] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
```

```
## [04:08:04] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:08:04] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:08:06] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:08:06] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:08:06] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:08:06] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:08:07] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:08:07] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:08:07] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:08:07] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:08:08] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:08:08] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:08:08] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:08:08] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:08:09] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:08:09] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:08:09] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:08:09] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:08:10] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:08:10] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:08:10] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:08:10] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:08:11] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:08:11] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:08:11] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:08:11] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:08:12] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:08:12] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:08:12] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:08:12] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:08:12] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:08:12] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:08:13] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:08:13] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:08:14] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:08:14] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:08:14] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:08:14] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:08:15] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:08:15] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:08:15] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:08:15] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:08:16] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:08:16] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:08:16] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:08:16] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:08:17] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:08:17] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:08:17] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:08:17] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:08:19] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:08:19] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:08:19] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:08:19] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
```

```
## [04:08:20] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:20] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:20] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:20] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:21] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:21] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:21] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:21] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:23] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:23] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:23] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:23] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:24] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:24] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:24] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:24] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:26] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:26] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:26] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:26] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:27] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:27] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:27] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:27] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:29] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:29] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:29] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:29] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:30] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:30] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:30] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:30] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:31] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:31] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:31] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:31] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:32] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:32] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:32] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:32] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:33] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:33] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:33] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:33] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:33] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:33] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:33] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:33] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:34] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:34] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:34] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:34] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:35] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:35] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
```

```
## [04:08:35] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:35] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:37] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:37] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:37] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:37] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:38] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:38] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:38] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:38] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:39] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:39] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:39] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:39] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:40] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:40] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:40] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:40] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:41] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:41] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:41] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:41] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:43] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:43] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:43] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:43] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:44] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:44] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:44] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:44] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:46] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:46] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:46] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:46] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:47] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:47] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:47] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:47] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:49] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:49] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:49] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:49] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:50] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:50] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:50] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:50] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:51] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:51] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:51] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:51] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:52] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:52] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:52] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:52] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
```

```
## [04:08:53] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:53] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:53] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:53] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:54] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:54] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:54] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:54] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:55] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:55] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:55] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:55] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:56] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:56] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:56] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:56] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:57] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:57] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:57] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:57] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:58] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:58] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:58] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:58] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:59] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:59] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:59] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:08:59] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:01] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:01] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:01] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:01] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:02] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:02] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:02] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:02] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:03] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:03] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:03] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:03] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:05] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:05] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:05] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:05] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:06] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:06] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:06] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:06] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:08] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:08] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:08] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:08] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:09] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:09] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
```

```
## [04:09:09] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:09] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:11] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:11] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:11] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:11] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:12] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:12] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:12] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:12] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:13] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:13] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:13] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:13] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:14] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:14] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:14] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:14] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:15] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:15] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:15] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:15] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:16] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:16] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:16] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:16] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:17] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:17] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:17] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:17] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:18] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:18] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:18] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:18] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:19] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:19] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:19] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:19] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:20] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:20] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:20] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:20] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:21] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:21] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:21] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:21] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:22] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:22] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:22] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:22] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:24] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:24] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:24] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:24] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
```

```
## [04:09:25] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:09:25] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:09:25] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:09:25] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:09:26] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:09:26] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:09:26] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:09:26] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:09:28] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:09:28] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:09:28] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:09:28] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:09:29] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:09:29] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:09:29] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:09:29] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:09:31] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:09:31] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:09:31] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:09:31] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:09:33] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:09:33] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:09:33] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:09:33] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:09:34] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:09:34] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:09:34] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:09:34] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:09:35] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:09:35] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:09:35] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:09:35] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:09:36] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:09:36] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:09:36] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:09:36] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:09:37] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:09:37] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:09:37] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:09:37] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:09:38] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:09:38] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:09:38] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:09:38] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:09:39] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:09:39] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:09:39] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:09:39] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:09:39] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:09:39] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:09:40] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:09:40] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:09:41] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:09:41] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
```

```
## [04:09:41] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:41] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:42] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:42] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:42] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:42] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:43] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:43] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:43] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:43] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:44] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:44] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:44] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:44] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:46] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:46] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:46] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:46] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:47] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:47] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:47] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:47] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:48] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:48] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:48] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:48] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:50] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:50] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:50] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:50] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:51] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:51] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:51] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:51] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:53] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:53] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:53] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:53] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:55] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:55] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:55] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:55] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:56] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:56] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:56] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:56] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:57] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:57] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:57] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:57] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:58] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:58] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:58] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:09:58] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
```

```
## [04:09:59] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:09:59] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:09:59] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:09:59] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:00] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:00] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:00] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:00] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:01] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:01] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:01] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:01] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:01] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:01] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:01] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:01] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:03] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:03] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:03] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:03] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:04] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:04] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:04] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:04] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:05] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:05] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:05] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:05] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:06] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:06] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:06] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:06] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:07] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:07] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:07] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:07] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:08] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:08] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:08] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:08] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:10] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:10] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:10] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:10] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:12] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:12] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:12] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:12] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:13] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:13] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:13] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:13] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:15] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:15] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
```

```
## [04:10:15] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:15] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:16] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:16] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:16] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:16] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:18] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:18] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:18] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:18] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:19] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:19] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:19] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:19] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:20] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:20] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:20] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:20] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:20] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:20] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:20] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:20] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:21] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:21] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:21] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:21] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:22] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:22] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:22] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:22] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:23] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:23] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:23] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:23] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:24] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:24] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:24] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:24] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:25] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:25] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:25] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:25] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:26] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:26] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:26] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:26] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:28] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:28] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:28] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:28] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:29] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:29] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:29] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:10:29] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
```

```
## [04:10:30] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:10:30] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:10:30] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:10:30] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:10:32] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:10:32] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:10:32] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:10:32] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:10:33] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:10:33] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:10:33] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:10:33] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:10:35] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:10:35] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:10:35] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:10:35] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:10:36] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:10:36] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:10:36] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:10:36] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:10:38] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:10:38] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:10:38] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:10:38] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:10:39] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:10:39] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:10:39] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:10:39] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:10:40] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:10:40] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:10:40] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:10:40] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:10:41] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:10:41] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:10:41] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:10:41] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:10:42] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:10:42] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:10:42] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:10:42] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:10:43] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:10:43] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:10:43] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:10:43] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:10:44] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:10:44] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:10:44] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:10:44] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:10:45] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:10:45] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:10:45] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:10:45] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:10:46] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:10:46] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
```

```
## [04:10:46] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:10:46] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:10:47] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:10:47] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:10:47] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:10:47] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:10:48] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:10:48] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:10:48] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:10:48] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:10:50] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:10:50] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:10:50] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:10:50] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:10:51] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:10:51] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:10:51] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:10:51] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:10:52] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:10:52] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:10:52] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:10:52] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:10:53] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:10:53] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:10:54] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:10:54] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:10:55] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:10:55] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:10:55] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:10:55] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:10:56] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:10:56] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:10:57] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:10:57] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:10:58] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:10:58] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:10:58] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:10:58] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:00] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:00] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:00] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:00] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:01] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:01] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:01] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:01] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:02] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:02] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:02] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:02] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:03] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:03] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:03] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:03] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
```

```
## [04:11:04] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:04] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:04] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:04] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:05] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:05] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:05] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:05] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:06] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:06] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:06] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:06] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:07] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:07] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:07] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:07] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:08] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:08] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:08] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:08] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:09] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:09] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:09] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:09] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:10] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:10] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:10] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:10] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:11] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:11] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:11] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:12] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:13] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:13] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:13] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:13] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:14] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:14] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:14] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:14] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:15] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:15] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:15] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:15] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:17] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:17] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:17] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:17] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:18] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:18] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:18] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:18] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:20] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:20] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
```

```
## [04:11:20] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:20] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:22] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:22] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:22] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:22] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:23] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:23] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:23] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:23] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:24] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:24] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:24] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:24] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:25] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:25] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:25] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:25] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:26] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:26] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:26] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:26] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:27] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:27] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:27] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:27] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:28] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:28] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:28] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:28] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:28] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:28] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:28] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:28] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:30] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:30] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:30] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:30] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:31] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:31] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:31] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:31] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:32] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:32] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:32] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:32] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:33] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:33] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:33] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:33] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:35] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:35] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:35] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:35] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
```

```
## [04:11:36] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:36] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:36] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:36] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:37] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:37] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:37] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:37] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:39] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:39] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:39] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:39] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:40] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:40] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:40] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:40] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:42] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:42] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:42] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:42] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:43] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:43] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:43] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:43] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:45] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:45] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:45] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:45] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:46] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:46] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:46] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:46] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:47] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:47] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:47] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:47] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:48] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:48] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:48] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:48] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:49] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:49] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:49] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:49] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:49] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:49] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:49] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:49] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:50] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:50] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:50] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:50] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:52] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:11:52] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
```

```
## [04:11:52] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:52] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:53] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:53] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:53] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:53] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:54] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:54] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:54] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:54] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:55] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:55] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:55] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:55] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:56] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:56] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:56] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:56] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:57] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:57] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:57] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:57] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:59] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:59] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:59] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:11:59] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:01] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:01] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:01] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:01] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:02] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:02] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:02] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:02] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:04] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:04] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:04] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:04] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:05] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:05] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:05] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:05] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:07] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:07] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:07] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:07] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:08] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:08] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:08] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:08] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:09] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:09] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:09] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:09] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
```

```
## [04:12:09] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:09] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:09] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:09] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:10] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:10] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:10] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:10] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:11] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:11] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:11] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:11] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:12] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:12] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:12] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:12] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:13] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:13] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:13] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:13] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:15] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:15] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:15] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:15] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:16] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:16] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:16] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:16] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:17] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:17] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:17] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:17] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:18] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:18] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:18] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:18] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:19] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:19] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:19] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:19] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:21] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:21] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:21] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:21] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:23] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:23] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:23] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:23] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:24] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:24] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:24] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:24] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:26] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:26] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
```

```
## [04:12:26] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:12:26] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:12:27] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:12:27] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:12:27] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:12:27] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:12:29] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:12:29] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:12:29] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:12:29] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:12:30] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:12:30] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:12:30] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:12:30] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:12:30] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:12:30] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:12:30] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:12:30] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:12:31] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:12:31] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:12:31] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:12:31] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:12:32] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:12:32] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:12:32] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:12:32] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:12:33] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:12:33] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:12:33] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:12:33] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:12:34] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:12:34] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:12:34] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:12:34] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:12:35] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:12:35] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:12:35] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:12:35] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:12:36] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:12:36] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:12:36] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:12:36] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:12:37] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:12:37] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:12:37] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:12:37] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:12:39] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:12:39] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:12:39] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:12:39] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:12:40] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:12:40] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:12:40] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:12:40] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
```

```
## [04:12:41] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:41] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:41] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:41] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:43] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:43] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:43] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:43] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:44] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:44] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:44] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:44] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:45] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:45] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:45] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:45] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:47] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:47] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:47] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:47] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:49] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:49] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:49] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:49] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:50] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:50] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:50] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:50] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:51] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:51] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:51] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:51] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:52] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:52] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:52] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:52] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:53] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:53] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:53] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:53] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:54] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:54] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:54] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:54] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:55] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:55] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:55] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:55] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:55] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:55] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:56] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:56] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:57] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:57] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
```

```
## [04:12:57] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:57] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:58] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:58] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:58] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:58] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:59] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:59] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:59] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:12:59] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:00] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:00] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:00] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:00] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:02] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:02] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:02] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:02] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:03] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:03] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:03] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:03] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:04] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:04] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:04] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:04] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:06] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:06] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:06] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:06] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:07] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:07] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:07] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:07] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:09] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:09] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:09] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:09] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:10] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:10] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:10] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:10] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:12] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:12] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:12] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:12] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:13] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:13] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:13] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:13] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:14] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:14] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:14] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:14] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
```

```
## [04:13:15] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:15] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:15] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:15] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:16] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:16] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:16] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:16] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:16] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:16] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:16] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:17] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:17] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:17] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:17] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:17] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:18] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:18] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:19] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:19] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:20] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:20] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:20] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:20] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:21] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:21] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:21] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:21] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:22] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:22] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:22] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:22] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:23] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:23] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:23] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:23] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:24] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:24] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:24] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:24] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:26] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:26] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:26] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:26] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:28] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:28] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:28] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:28] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:29] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:29] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:29] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:29] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:31] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:31] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
```

```
## [04:13:31] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:13:31] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:13:32] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:13:32] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:13:32] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:13:32] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:13:34] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:13:34] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:13:34] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:13:34] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:13:35] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:13:35] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:13:35] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:13:35] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:13:36] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:13:36] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:13:36] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:13:36] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:13:36] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:13:36] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:13:36] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:13:36] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:13:37] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:13:37] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:13:37] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:13:37] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:13:38] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:13:38] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:13:38] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:13:38] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:13:39] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:13:39] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:13:39] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:13:39] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:13:40] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:13:40] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:13:40] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:13:40] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:13:42] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:13:42] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:13:42] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:13:42] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:13:43] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:13:43] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:13:43] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:13:43] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:13:44] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:13:44] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:13:44] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:13:44] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:13:45] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:13:45] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:13:45] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
## [04:13:45] WARNING: src/c_api/c_api.cc:935: ‘ntree_limit‘ is deprecated, use ‘iteration_range‘ instea
```

```
## [04:13:46] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:46] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:46] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:46] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:48] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:48] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:48] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:48] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:49] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:49] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:49] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:49] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:51] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:51] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:51] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:51] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:52] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:52] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:52] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:52] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:54] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:54] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:54] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:54] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:55] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:55] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:55] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
## [04:13:55] WARNING: src/c_api/c_api.cc:935: `ntree_limit` is deprecated, use `iteration_range` instea
```

```
# Print the model summary
print(cv_model_xgb)
```

```
## eXtreme Gradient Boosting
##
## 48676 samples
##     7 predictor
##     2 classes: 'No', 'Yes'
##
## No pre-processing
## Resampling: Cross-Validated (10 fold)
## Summary of sample sizes: 43809, 43808, 43809, 43808, 43809, 43808, ...
## Resampling results across tuning parameters:
##
##   eta  max_depth  colsample_bytree  subsample  nrounds  ROC        Sens
##   0.3  1          0.6               0.50        50      0.8067484  0.5189019
##   0.3  1          0.6               0.50       100      0.8082346  0.5146834
##   0.3  1          0.6               0.50       150      0.8083299  0.5131647
##   0.3  1          0.6               0.75        50      0.8071119  0.5139242
##   0.3  1          0.6               0.75       100      0.8082923  0.5129112
##   0.3  1          0.6               0.75       150      0.8086110  0.5127429
##   0.3  1          0.6               1.00        50      0.8069735  0.5167921
##   0.3  1          0.6               1.00       100      0.8082859  0.5153578
##   0.3  1          0.6               1.00       150      0.8085385  0.5149361
##   0.3  1          0.8               0.50        50      0.8074304  0.5166229
```

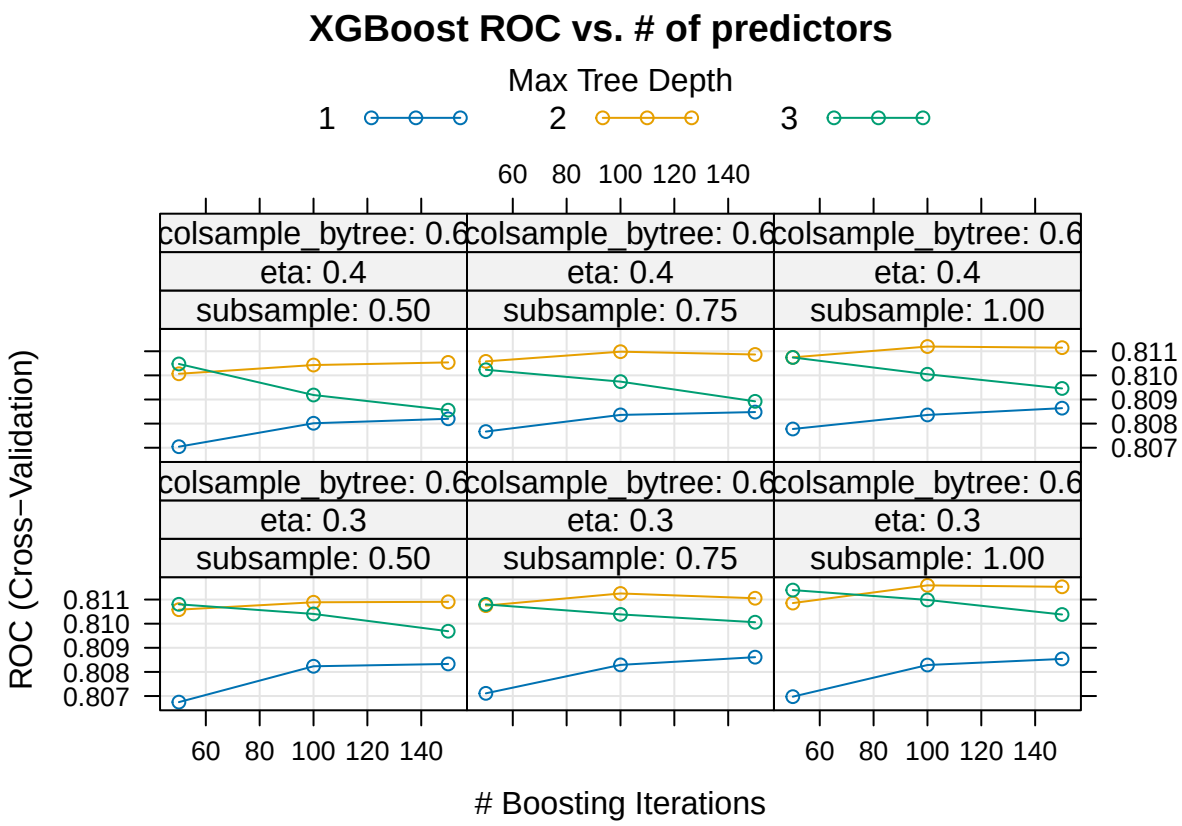
```
##   0.3  1          0.8              0.50        100       0.8082768  0.5144301
##   0.3  1          0.8              0.50        150       0.8083759  0.5139239
##   0.3  1          0.8              0.75         50       0.8077018  0.5138385
##   0.3  1          0.8              0.75        100       0.8085343  0.5138392
##   0.3  1          0.8              0.75        150       0.8086751  0.5121513
##   0.3  1          0.8              1.00         50       0.8073419  0.5150200
##   0.3  1          0.8              1.00        100       0.8084560  0.5140077
##   0.3  1          0.8              1.00        150       0.8086671  0.5139233
##   0.3  2          0.6              0.50         50       0.8105805  0.5179732
##   0.3  2          0.6              0.50        100       0.8108874  0.5208421
##   0.3  2          0.6              0.50        150       0.8109067  0.5214334
##   0.3  2          0.6              0.75         50       0.8107483  0.5176359
##   0.3  2          0.6              0.75        100       0.8112520  0.5185638
##   0.3  2          0.6              0.75        150       0.8110545  0.5194927
##   0.3  2          0.6              1.00         50       0.8108538  0.5161171
##   0.3  2          0.6              1.00        100       0.8115886  0.5176366
##   0.3  2          0.6              1.00        150       0.8115290  0.5185644
##   0.3  2          0.8              0.50         50       0.8104560  0.5167081
##   0.3  2          0.8              0.50        100       0.8109526  0.5189018
##   0.3  2          0.8              0.50        150       0.8106990  0.5198299
##   0.3  2          0.8              0.75         50       0.8109128  0.5192390
##   0.3  2          0.8              0.75        100       0.8113094  0.5208430
##   0.3  2          0.8              0.75        150       0.8110562  0.5206735
##   0.3  2          0.8              1.00         50       0.8106001  0.5176364
##   0.3  2          0.8              1.00        100       0.8112911  0.5186490
##   0.3  2          0.8              1.00        150       0.8113601  0.5207584
##   0.3  3          0.6              0.50         50       0.8108029  0.5212646
##   0.3  3          0.6              0.50        100       0.8104045  0.5214330
##   0.3  3          0.6              0.50        150       0.8096866  0.5206738
##   0.3  3          0.6              0.75         50       0.8107995  0.5225304
##   0.3  3          0.6              0.75        100       0.8103844  0.5216864
##   0.3  3          0.6              0.75        150       0.8100603  0.5209268
##   0.3  3          0.6              1.00         50       0.8113923  0.5205057
##   0.3  3          0.6              1.00        100       0.8109846  0.5199148
##   0.3  3          0.6              1.00        150       0.8103803  0.5201678
##   0.3  3          0.8              0.50         50       0.8106817  0.5222773
##   0.3  3          0.8              0.50        100       0.8100270  0.5224462
##   0.3  3          0.8              0.50        150       0.8094262  0.5197461
##   0.3  3          0.8              0.75         50       0.8109685  0.5224454
##   0.3  3          0.8              0.75        100       0.8102883  0.5210116
##   0.3  3          0.8              0.75        150       0.8095474  0.5202515
##   0.3  3          0.8              1.00         50       0.8112891  0.5241330
##   0.3  3          0.8              1.00        100       0.8107203  0.5225302
##   0.3  3          0.8              1.00        150       0.8099810  0.5222775
##   0.4  1          0.6              0.50         50       0.8070431  0.5173835
##   0.4  1          0.6              0.50        100       0.8080150  0.5129960
##   0.4  1          0.6              0.50        150       0.8081997  0.5118141
##   0.4  1          0.6              0.75         50       0.8076711  0.5144297
##   0.4  1          0.6              0.75        100       0.8083614  0.5100425
##   0.4  1          0.6              0.75        150       0.8084790  0.5104640
##   0.4  1          0.6              1.00         50       0.8077775  0.5145133
##   0.4  1          0.6              1.00        100       0.8083600  0.5123200
##   0.4  1          0.6              1.00        150       0.8086406  0.5107172
##   0.4  1          0.8              0.50         50       0.8079248  0.5161176
```

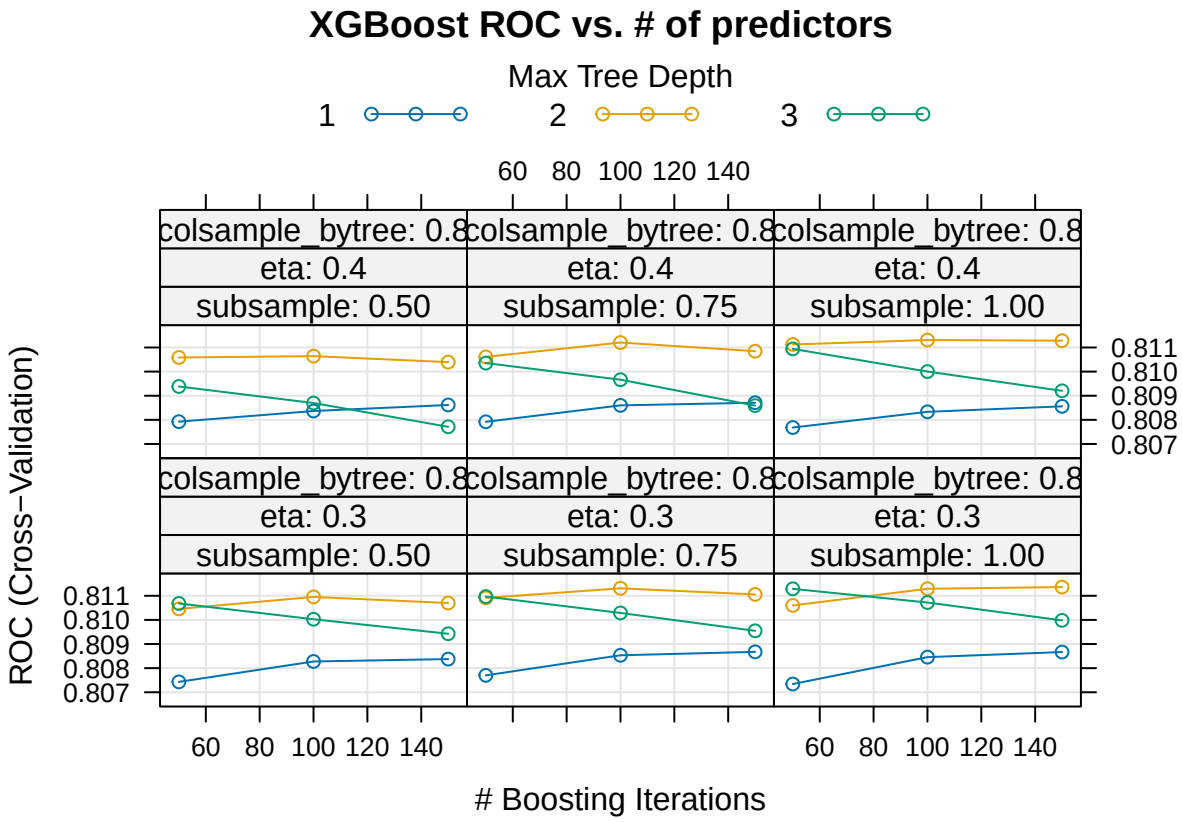
```
##   0.4  1          0.8              0.50       100      0.8083660  0.5128276
##   0.4  1          0.8              0.50       150      0.8086167  0.5124891
##   0.4  1          0.8              0.75        50      0.8079187  0.5183111
##   0.4  1          0.8              0.75       100      0.8085995  0.5110550
##   0.4  1          0.8              0.75       150      0.8087105  0.5115608
##   0.4  1          0.8              1.00        50      0.8076806  0.5122356
##   0.4  1          0.8              1.00       100      0.8083320  0.5135018
##   0.4  1          0.8              1.00       150      0.8085596  0.5100421
##   0.4  2          0.6              0.50        50      0.8100651  0.5185645
##   0.4  2          0.6              0.50       100      0.8104281  0.5187325
##   0.4  2          0.6              0.50       150      0.8105374  0.5204204
##   0.4  2          0.6              0.75        50      0.8105794  0.5183956
##   0.4  2          0.6              0.75       100      0.8109815  0.5208428
##   0.4  2          0.6              0.75       150      0.8108664  0.5197460
##   0.4  2          0.6              1.00        50      0.8107463  0.5182264
##   0.4  2          0.6              1.00       100      0.8111953  0.5216864
##   0.4  2          0.6              1.00       150      0.8111485  0.5215176
##   0.4  2          0.8              0.50        50      0.8105842  0.5183970
##   0.4  2          0.8              0.50       100      0.8106420  0.5216873
##   0.4  2          0.8              0.50       150      0.8103925  0.5205061
##   0.4  2          0.8              0.75        50      0.8106110  0.5199986
##   0.4  2          0.8              0.75       100      0.8112046  0.5188174
##   0.4  2          0.8              0.75       150      0.8108458  0.5201679
##   0.4  2          0.8              1.00        50      0.8111247  0.5195770
##   0.4  2          0.8              1.00       100      0.8113090  0.5201676
##   0.4  2          0.8              1.00       150      0.8112820  0.5205897
##   0.4  3          0.6              0.50        50      0.8104739  0.5214323
##   0.4  3          0.6              0.50       100      0.8091853  0.5226987
##   0.4  3          0.6              0.50       150      0.8085576  0.5192397
##   0.4  3          0.6              0.75        50      0.8102321  0.5212647
##   0.4  3          0.6              0.75       100      0.8097400  0.5203359
##   0.4  3          0.6              0.75       150      0.8089232  0.5219401
##   0.4  3          0.6              1.00        50      0.8107434  0.5224464
##   0.4  3          0.6              1.00       100      0.8100468  0.5219397
##   0.4  3          0.6              1.00       150      0.8094581  0.5216863
##   0.4  3          0.8              0.50        50      0.8093831  0.5223616
##   0.4  3          0.8              0.50       100      0.8086966  0.5216868
##   0.4  3          0.8              0.50       150      0.8077121  0.5184802
##   0.4  3          0.8              0.75        50      0.8103535  0.5204218
##   0.4  3          0.8              0.75       100      0.8096648  0.5208427
##   0.4  3          0.8              0.75       150      0.8085908  0.5218557
##   0.4  3          0.8              1.00        50      0.8109413  0.5228673
##   0.4  3          0.8              1.00       100      0.8100025  0.5235432
##   0.4  3          0.8              1.00       150      0.8092030  0.5226149
##   Spec
##   0.9196994
##   0.9210843
##   0.9218176
##   0.9208399
##   0.9211387
##   0.9214646
##   0.9206770
##   0.9208400
##   0.9215189
```

```
##   0.9203239
##   0.9209486
##   0.9216547
##   0.9207585
##   0.9216003
##   0.9222521
##   0.9208942
##   0.9211387
##   0.9216818
##   0.9208672
##   0.9209758
##   0.9208673
##   0.9213561
##   0.9214917
##   0.9208943
##   0.9212474
##   0.9213831
##   0.9212745
##   0.9207314
##   0.9206227
##   0.9206227
##   0.9205956
##   0.9202154
##   0.9203512
##   0.9209758
##   0.9214918
##   0.9205956
##   0.9202969
##   0.9195093
##   0.9199438
##   0.9199167
##   0.9199981
##   0.9197538
##   0.9204599
##   0.9201069
##   0.9202698
##   0.9202155
##   0.9197809
##   0.9196995
##   0.9195637
##   0.9196723
##   0.9196995
##   0.9192379
##   0.9194823
##   0.9196724
##   0.9198080
##   0.9211115
##   0.9216818
##   0.9203512
##   0.9217904
##   0.9221435
##   0.9203240
##   0.9210029
##   0.9217905
```

```
##   0.9204599
##   0.9216275
##   0.9222792
##   0.9193193
##   0.9213831
##   0.9218176
##   0.9209486
##   0.9210573
##   0.9220620
##   0.9209488
##   0.9211931
##   0.9210302
##   0.9210572
##   0.9204328
##   0.9207043
##   0.9211115
##   0.9207857
##   0.9202969
##   0.9208672
##   0.9206227
##   0.9201882
##   0.9202969
##   0.9208943
##   0.9207314
##   0.9207586
##   0.9207314
##   0.9201611
##   0.9199168
##   0.9194007
##   0.9201882
##   0.9200254
##   0.9199167
##   0.9200796
##   0.9197810
##   0.9198895
##   0.9193737
##   0.9199710
##   0.9192649
##   0.9198081
##   0.9200527
##   0.9199982
##   0.9192107
##   0.9195365
##   0.9191020
##   0.9194822
##
## Tuning parameter 'gamma' was held constant at a value of 0
## Tuning
##  parameter 'min_child_weight' was held constant at a value of 1
## ROC was used to select the optimal model using the largest value.
## The final values used for the model were nrounds = 100, max_depth = 2, eta
##  = 0.3, gamma = 0, colsample_bytree = 0.6, min_child_weight = 1 and subsample
##  = 1.
```

```r
plot(cv_model_xgb, main = "XGBoost ROC vs. # of predictors")
```






```
extract_auc_xgb=as.data.frame(cv_model_xgb$resample)

auc_xgb_xvalidated<-mean(as.numeric(extract_auc_xgb$ROC))

#adding AUC metric to the dataframe
auc_table <- auc_table %>% add_row(Model="XGBoost model", AUC_single_model=auc_value_xgb,
                                   AUC_10F_xvalidated = auc_xgb_xvalidated)
auc_table
```

```
##                          Model AUC_single_model AUC_10F_xvalidated
## 1    Logistic Regression model        0.7918455          0.7915490
## 2          Random Forest Model        0.8064965          0.7736533
## 3 Support Vector Machine model        0.7880106          0.8033707
## 4                XGBoost model        0.8030750          0.8115886
```

The Gradient Boosting Model performed better than any other model we tried with the single model AUCROC 0.80 and 10-fold cross validated AUROC of 0.81.

##Conclusion We developed predictive models for colon cancer screening using relevant social determinants of health and demographic characteristics, including food insecurity, poverty, health insurance, age, sex, and BMI. Four different models of varying complexity were tested: Logistic Regression, Random Forest, Support Vector Machine, and Gradient Boosting. Model performance was evaluated using the Area Under the Receiver Operating Characteristics Curve (AUROC). The 'Caret' package was employed to perform 10-fold cross-validation for each predictive model. Among the models, Gradient Boosting demonstrated the best performance, achieving a 10-fold cross-validated AUROC of 0.81.

Characteristic	N	Overall N = 176,355[1]	1 N = 154,113[1]	2 N = 9,631[1]	3 N =
food_insecure	176,355	22,242 (13%)	0 (0%)	9,631 (100%)	12,611
Survey year	176,355				
2018		56,143 (32%)	48,055 (31%)	3,540 (37%)	4,548
2019		31,860 (18%)	27,755 (18%)	1,598 (17%)	2,507
2020		31,450 (18%)	27,998 (18%)	1,505 (16%)	1,947
2021		29,343 (17%)	26,365 (17%)	1,371 (14%)	1,607
2022		27,559 (16%)	23,940 (16%)	1,617 (17%)	2,002
Age	176,355	52 (36, 66)	53 (37, 67)	47 (32, 62)	47 (3
bmicat	141,986				
1		2,263 (1.6%)	1,944 (1.6%)	132 (1.8%)	187 (
2		45,179 (32%)	40,711 (33%)	1,984 (27%)	2,484
3		49,024 (35%)	43,777 (35%)	2,287 (31%)	2,960
4		45,520 (32%)	38,046 (31%)	3,071 (41%)	4,403
female	176,346	94,457 (54%)	81,342 (53%)	5,644 (59%)	7,471
racenew_r1	170,436				
Asian		10,405 (6.1%)	9,479 (6.3%)	488 (5.4%)	438 (
Black		19,658 (12%)	14,978 (10%)	1,811 (20%)	2,869
Other		5,693 (3.3%)	4,329 (2.9%)	500 (5.5%)	864 (
White		134,680 (79%)	120,650 (81%)	6,264 (69%)	7,766
white	176,355	134,680 (76%)	120,650 (78%)	6,264 (65%)	7,766
black	176,355	19,658 (11%)	14,978 (9.7%)	1,811 (19%)	2,869
asian	176,355	10,405 (5.9%)	9,479 (6.2%)	488 (5.1%)	438 (
other_race	176,355	5,693 (3.2%)	4,329 (2.8%)	500 (5.2%)	864 (
hispanic	176,139	24,163 (14%)	19,232 (12%)	2,250 (23%)	2,681
foodstamp	171,215	18,821 (11%)	10,568 (7.1%)	3,031 (32%)	5,222
food_security_score	176,355	0.00 (0.00, 0.00)	0.00 (0.00, 0.00)	1.00 (1.00, 2.00)	5.00 (3.
private_ins	175,617	103,752 (59%)	96,542 (63%)	3,717 (39%)	3,493
state_ins	175,319	4,878 (2.8%)	3,664 (2.4%)	493 (5.2%)	721 (
chi_ins	175,319	101 (<0.1%)	78 (<0.1%)	10 (0.1%)	13 (
medicaid	175,319	17,471 (10.0%)	11,259 (7.3%)	2,295 (24%)	3,917
medicare	175,319	49,533 (28%)	43,925 (29%)	2,364 (25%)	3,244
other_gov_ins	175,319	2,221 (1.3%)	1,783 (1.2%)	191 (2.0%)	247 (
no_ins	175,319	14,491 (8.3%)	10,644 (6.9%)	1,488 (16%)	2,359
insurance	175,617				
1		103,752 (59%)	96,542 (63%)	3,717 (39%)	3,493
2		52,663 (30%)	42,148 (27%)	4,123 (43%)	6,392
3		19,202 (11%)	14,827 (9.7%)	1,727 (18%)	2,648
poverty_r	172,409				
<1		16,981 (9.8%)	10,342 (6.9%)	2,312 (25%)	4,327
>=5		54,012 (31%)	53,086 (35%)	599 (6.4%)	327 (
1-1.99		29,634 (17%)	21,807 (14%)	3,149 (34%)	4,678
2-4.99		71,782 (42%)	65,479 (43%)	3,289 (35%)	3,014
health_r1	176,237				
Excellent		41,936 (24%)	39,039 (25%)	1,492 (16%)	1,405
Fair		19,352 (11%)	14,265 (9.3%)	1,852 (19%)	3,235
Good		49,480 (28%)	42,311 (27%)	3,175 (33%)	3,994
Poor		6,022 (3.4%)	3,901 (2.5%)	594 (6.2%)	1,527
Very Good		59,447 (34%)	54,504 (35%)	2,510 (26%)	2,433
colon_scr	51,957	39,059 (75%)	35,182 (76%)	1,594 (68%)	2,283