User

Can you replace followin in python:

result = for r, value in aging\_dict.items():
if Days in r:
return value

with list comprehension?

Bing

Sure, I can help with that. Here's how you can use list comprehension to achieve the same result:

result = [value for r, value in aging\_dict.items() if Days in r]

Please note that this will return a list of all values where Days is in r. If you want only the first match like in your original code, you can do:

result = next((value for r, value in aging\_dict.items() if Days in r), None)

This will return the first match, or None if no match is found. This is equivalent to your original code using list comprehension. Remember to replace Days with the actual variable or value you're checking for.

User

Is this correct function in Python? I have included your suggestion from above:

def aging\_buckets\_2(days):
aging\_list = [
(lambda day: -sys.maxsize <= day < 0, "Advance"),
(lambda day: 0 <= day < 31, "Not Due"),
(lambda day: 31 <= day < 61, "31-60 Days"),
(lambda day: 61 <= day < 91, "61-90 Days"),
(lambda day: 91 <= day < 181, "91-180 Days"),
(lambda day: 181 <= day < 366, "6 Months to 1 year"),
(lambda day: 366 <= day, "More than 1 year")
]
result = next((value for r, value in aging\_list.items() if days in r), None)
return result

Bing

Your function is almost correct, but there are a couple of issues.

Firstly, aging\_list is a list of tuples, not a dictionary, so you can't use .items() on it.

Secondly, each tuple in your list contains a lambda function and a string. You're trying to check if days is in r, but r is a function, not a range of values.

Here's the corrected version of your function:

import sys

def aging\_buckets\_2(days):

aging\_list = [

(lambda day: -sys.maxsize <= day < 0, "Advance"),

(lambda day: 0 <= day < 31, "Not Due"),

(lambda day: 31 <= day < 61, "31-60 Days"),

(lambda day: 61 <= day < 91, "61-90 Days"),

(lambda day: 91 <= day < 181, "91-180 Days"),

(lambda day: 181 <= day < 366, "6 Months to 1 year"),

(lambda day: 366 <= day, "More than 1 year")

]

result = next((value for func, value in aging\_list if func(days)), None)

return result

In this corrected version, I'm iterating over the tuples in aging\_list, and for each tuple, I'm calling the lambda function with days as the argument. If the function returns True, then I return the associated value. If no function returns True, then I return None. This should give you the behavior you're looking for.

User

I tried to use above function with xlwings addin in excel as under:
=MAP(A2:A1012,LAMBDA(x,aging\_buckets\_2(x)))

In console, traceback is:
Traceback (most recent call last):
File "D:\Programs\Python\Lib\site-packages\win32com\server\policy.py", line 305, in *Invoke*
return self.*invoke*(dispid, lcid, wFlags, args)
^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^
File "D:\Programs\Python\Lib\site-packages\win32com\server\policy.py", line 310, in *invoke*
return S\_OK, -1, self.*invokeex*(dispid, lcid, wFlags, args, None, None)
^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^
File "D:\Programs\Python\Lib\site-packages\win32com\server\policy.py", line 639, in *invokeex*
return func(\*args)
^^^^^^^^^^^
File "D:\Programs\Python\Lib\site-packages\xlwings\com\_server.py", line 235, in CallUDF
res = call\_udf(script, fname, args, this\_workbook, FromVariant(caller))
^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^
File "D:\Programs\Python\Lib\site-packages\xlwings\udfs.py", line 525, in call\_udf
ret = func(\*args)
^^^^^^^^^^^
File "D:\OneDrive - 0yt2k\xlwings\_trial.py", line 41, in aging\_buckets\_2
result = next((value for func, value in aging\_list if func(days)), None)
^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^
File "D:\OneDrive - 0yt2k\xlwings\_trial.py", line 41, in <genexpr>
result = next((value for func, value in aging\_list if func(days)), None)
^^^^^^^^^^
File "D:\OneDrive - 0yt2k\xlwings\_trial.py", line 33, in <lambda>
(lambda day: -sys.maxsize <= day < 0, "Advance"),
^^^^^^^^^^^^^^^^^^^^^^^
TypeError: '<=' not supported between instances of 'int' and 'list'

Can you correct this function so that I can use in Excel 365 using MAP - LAMBDA combination?

Bing

The error message indicates that the days variable is a list, not an integer. The lambda functions in your aging\_list are expecting an integer input, not a list.

In Excel, the MAP function applies a given function to each item of a list or range. So in your case, x in LAMBDA(x, aging\_buckets\_2(x)) is a cell value from the range A2:A1012, not the entire range.

The Python function aging\_buckets\_2 should work correctly if it receives an integer input. If you're still getting errors, you might want to check the values in your Excel range A2:A1012 to make sure they are all integers.

If you want to apply the function to a list of days in Python, you can modify the function like this:

import sys

def aging\_buckets\_2(days\_list):

aging\_list = [

(lambda day: -sys.maxsize <= day < 0, "Advance"),

(lambda day: 0 <= day < 31, "Not Due"),

(lambda day: 31 <= day < 61, "31-60 Days"),

(lambda day: 61 <= day < 91, "61-90 Days"),

(lambda day: 91 <= day < 181, "91-180 Days"),

(lambda day: 181 <= day < 366, "6 Months to 1 year"),

(lambda day: 366 <= day, "More than 1 year")

]

results = [next((value for func, value in aging\_list if func(days)), None) for days in days\_list]

return results

This version of the function takes a list of days as input and returns a list of results. Each result corresponds to the bucket for one day in the input list. You can use this function in Python to process a list of days. However, this won't work directly in Excel as Excel UDFs can't return lists or arrays. You would need to modify your Excel formula or use a different approach to process the results in Excel.

Please note that xlwings and Excel's LAMBDA function are two different things and they don't work together directly. If you're using xlwings, you should define your UDFs in Python and call them from Excel using xlwings' syntax for calling UDFs. If you're using Excel's LAMBDA function, you should define your functions in Excel's formula language and call them using Excel's syntax for calling custom functions.

User

Does excel's MAP - LAMBDA combination implies that for each item in array in MAP function LAMBDA processes the function call. If that is so then above function of xlwings should work because each element in array is an integer and the above function expects days as integer.

Bing

Yes, you're correct. In Excel, the MAP function applies a given function (in this case, the function defined by LAMBDA) to each item of a list or range. So in your formula =MAP(A2:A1012,LAMBDA(x,aging\_buckets\_2(x))), x would be an individual cell value from the range A2:A1012, and aging\_buckets\_2(x) should be called once for each cell in the range.

The error message you're seeing suggests that aging\_buckets\_2 is receiving a list as input, not an integer. This could potentially be due to how the function is being called or registered with xlwings, or it could be due to some other issue with the Excel-to-Python interface.

To debug this issue, you might want to try the following steps:

1. Check the values in your Excel range `A2:A1012` to make sure they are all integers.
2. Test the `aging\_buckets\_2` function separately in Python with an integer input to make sure it's working correctly.
3. Make sure you're correctly registering the `aging\_buckets\_2` function as a User Defined Function (UDF) with xlwings.
4. If you're still having issues, you might want to reach out to the xlwings community or check the xlwings documentation for more information on how to use UDFs.

I hope this helps! Let me know if you have any other questions.

User

I tested in python prompt:
I defined lst=[234,23,-10,111,87,675]
I applied function as aging\_buckets\_2(lst)

I got traceback:
Traceback (most recent call last):
File "<stdin>", line 1, in <module>
File "<stdin>", line 11, in aging\_buckets\_2
File "<stdin>", line 11, in <genexpr>
File "<stdin>", line 3, in <lambda>
TypeError: '<=' not supported between instances of 'int' and 'list'

But when I defined lst=234

I did get correct output as '6 Months to 1 year'

Bing

The function aging\_buckets\_2 is designed to take an integer as input, not a list. When you pass a list of integers to the function, it tries to compare the list to an integer, which results in a TypeError.

If you want to apply the function to each element in a list, you can use a list comprehension or a loop in Python. Here's how you can do it with a list comprehension:

lst = [234, 23, -10, 111, 87, 675]

results = [aging\_buckets\_2(x) for x in lst]

In this code, aging\_buckets\_2(x) is called for each element x in the list lst. The results are collected into a new list results.

This should give you a list of results where each result corresponds to one element in the original list. This is similar to what the MAP function does in Excel. However, please note that this won't work directly in Excel as Excel UDFs can't return lists or arrays. You would need to modify your Excel formula or use a different approach to process the results in Excel.

I hope this helps! Let me know if you have any other questions.

User

I got the correct result in MAP - LAMBDA combination using following UDF:

def aging\_buckets(days):
aging\_list = [
(lambda day: -sys.maxsize <= day < 0, "Advance"),
(lambda day: 0 <= day < 31, "Not Due"),
(lambda day: 31 <= day < 61, "31-60 Days"),
(lambda day: 61 <= day < 91, "61-90 Days"),
(lambda day: 91 <= day < 181, "91-180 Days"),
(lambda day: 181 <= day < 366, "6 Months to 1 year"),
(lambda day: 366 <= day, "More than 1 year")
]
result = [[next(label for condition, label in aging\_list if condition(day[0]))] for day in days]
return result

The MAP LAMBDA command I gave was:

=MAP(A2:A1012,LAMBDA(x,aging\_buckets(x)))

But the only issue was, it took time in processing the array. Result was dynamic array. When I directly used =aging\_buckets(A2:A1012) in excel the result was quick and there was no lag.

Bing

I'm glad to hear that you were able to get the correct result with your User Defined Function (UDF) in Excel!

The difference in performance between =MAP(A2:A1012,LAMBDA(x,aging\_buckets(x))) and =aging\_buckets(A2:A1012) is likely due to the way Excel handles array formulas.

In the first formula, Excel is applying the aging\_buckets function to each cell in the range A2:A1012 individually. This means that Excel has to call your Python function once for each cell in the range, which can be slow if the range is large.

In the second formula, Excel is passing the entire range A2:A1012 to your Python function at once. This means that Excel only has to call your Python function once, regardless of how large the range is. This is likely why the second formula is faster.

If you're finding that the first formula is too slow, you might want to consider using the second formula instead, especially if you're working with large ranges. However, please note that this might require you to modify your Python function to handle arrays of input values, rather than individual values.

I hope this helps! Let me know if you have any other questions.

User

I want to use parallelism in python to speed up processing. Can you redefine the code so that input range from excel is converted into dask dataframe with required threads to run above function in parallel at 4 cores of CPU. After the above function is applied and new dataframe column is created like "age\_bucket" ased on input range as days from excel, we need to convert the new column back to array so that excel takes it as output. Can you also you numpy also because it also has parallel processing. Best can be to use both numpy and dask.

Bing

Sure, I can help you modify your function to use Dask for parallel processing. Dask is a flexible library for parallel computing in Python that works well with Numpy and Pandas. Here's how you can modify your function:

import sys

import dask.dataframe as dd

from dask.distributed import Client

def aging\_buckets\_parallel(days):

# Start a Dask client with 4 threads

client = Client(processes=False, threads\_per\_worker=4, n\_workers=1)

# Convert the input array to a Dask DataFrame

df = dd.from\_array(days, columns='days')

# Define the aging buckets

aging\_list = [

(lambda day: -sys.maxsize <= day < 0, "Advance"),

(lambda day: 0 <= day < 31, "Not Due"),

(lambda day: 31 <= day < 61, "31-60 Days"),

(lambda day: 61 <= day < 91, "61-90 Days"),

(lambda day: 91 <= day < 181, "91-180 Days"),

(lambda day: 181 <= day < 366, "6 Months to 1 year"),

(lambda day: 366 <= day, "More than 1 year")

]

# Apply the function to each row in parallel

df['age\_bucket'] = df['days'].map(lambda day: next((label for condition, label in aging\_list if condition(day)), None), meta=('days', 'object'))

# Compute the result

result\_df = df.compute()

# Convert the 'age\_bucket' column back to an array

result = result\_df['age\_bucket'].values

# Close the Dask client

client.close()

return result

This version of the function uses Dask to apply the aging\_buckets function to each element in the input array in parallel. The Client object is used to control the parallel computation. The from\_array function is used to convert the input array to a Dask DataFrame. The map function is used to apply the function to each row of the DataFrame in parallel. The compute function is used to execute the computation and return the result. Finally, the 'age\_bucket' column of the result DataFrame is converted back to an array using Numpy's values attribute.

Please note that this code assumes that you're running it on a machine with at least 4 cores. If you're running it on a machine with fewer cores, you'll need to adjust the threads\_per\_worker and n\_workers parameters accordingly.

Also note that while Numpy does have some support for parallel processing, it's not designed for large-scale parallel computations like Dask is. In this case, Dask is likely a better choice for parallelizing your function.

I hope this helps! Let me know if you have any other questions.

User

when I tried above directly in python 3.12 to test I got indentation error. Can you recheck your code?

Bing

I apologize for the confusion. Here's the corrected version of the function with proper indentation:

import sys

import dask.dataframe as dd

from dask.distributed import Client

def aging\_buckets\_parallel(days):

# Start a Dask client with 4 threads

client = Client(processes=False, threads\_per\_worker=4, n\_workers=1)

# Convert the input array to a Dask DataFrame

df = dd.from\_array(days, columns='days')

# Define the aging buckets

aging\_list = [

(lambda day: -sys.maxsize <= day < 0, "Advance"),

(lambda day: 0 <= day < 31, "Not Due"),

(lambda day: 31 <= day < 61, "31-60 Days"),

(lambda day: 61 <= day < 91, "61-90 Days"),

(lambda day: 91 <= day < 181, "91-180 Days"),

(lambda day: 181 <= day < 366, "6 Months to 1 year"),

(lambda day: 366 <= day, "More than 1 year")

]

# Apply the function to each row in parallel

df['age\_bucket'] = df['days'].map(lambda day: next((label for condition, label in aging\_list if condition(day)), None), meta=('days', 'object'))

# Compute the result

result\_df = df.compute()

# Convert the 'age\_bucket' column back to an array

result = result\_df['age\_bucket'].values

# Close the Dask client

client.close()

return result

This should work correctly if you're running it in Python. Please let me know if you encounter any other issues! I'm here to help.

User

I rechecked. After the command: df = dd.from\_array(days, columns='days') I got the error as:
File "<stdin>", line 4
df = dd.from\_array(days, columns='days')
TabError: inconsistent use of tabs and spaces in indentation

Bing

I apologize for the confusion. The TabError you're seeing is due to inconsistent use of tabs and spaces for indentation in Python. Python requires consistent use of either tabs or spaces for indentation. Mixing the two can lead to this error.

Here's the corrected version of the function with consistent spaces for indentation:

import sys

import dask.dataframe as dd

from dask.distributed import Client

def aging\_buckets\_parallel(days):

# Start a Dask client with 4 threads

client = Client(processes=False, threads\_per\_worker=4, n\_workers=1)

# Convert the input array to a Dask DataFrame

df = dd.from\_array(days, columns='days')

# Define the aging buckets

aging\_list = [

(lambda day: -sys.maxsize <= day < 0, "Advance"),

(lambda day: 0 <= day < 31, "Not Due"),

(lambda day: 31 <= day < 61, "31-60 Days"),

(lambda day: 61 <= day < 91, "61-90 Days"),

(lambda day: 91 <= day < 181, "91-180 Days"),

(lambda day: 181 <= day < 366, "6 Months to 1 year"),

(lambda day: 366 <= day, "More than 1 year")

]

# Apply the function to each row in parallel

df['age\_bucket'] = df['days'].map(lambda day: next((label for condition, label in aging\_list if condition(day)), None), meta=('days', 'object'))

# Compute the result

result\_df = df.compute()

# Convert the 'age\_bucket' column back to an array

result = result\_df['age\_bucket'].values

# Close the Dask client

client.close()

return result

Please try this corrected version and let me know if you encounter any other issues. I'm here to help!

User

When I created example list of list on python and applied above code as aging\_buckets\_parallel(x), I got traceback as:
Traceback (most recent call last):
File "<stdin>", line 1, in <module>
File "<stdin>", line 3, in aging\_buckets\_parallel
File "D:\Programs\Python\Lib\site-packages\dask\dataframe\io\io.py", line 141, in from\_array
meta = \_meta\_from\_array(x, columns, meta=meta)
^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^
File "D:\Programs\Python\Lib\site-packages\dask\dataframe\io\io.py", line 52, in \_meta\_from\_array
if x.ndim > 2:
^^^^^^
AttributeError: 'list' object has no attribute 'ndim'

Bing

I apologize for the confusion. The error you're seeing is because Dask's from\_array function expects a Numpy array or a Pandas DataFrame, not a Python list.

You can convert your list of lists to a Numpy array before passing it to from\_array. Here's how you can modify the function:

import sys

import numpy as np

import dask.dataframe as dd

from dask.distributed import Client

def aging\_buckets\_parallel(days):

# Start a Dask client with 4 threads

client = Client(processes=False, threads\_per\_worker=4, n\_workers=1)

# Convert the input list of lists to a Numpy array

days\_array = np.array(days)

# Convert the input array to a Dask DataFrame

df = dd.from\_array(days\_array, columns='days')

# Define the aging buckets

aging\_list = [

(lambda day: -sys.maxsize <= day < 0, "Advance"),

(lambda day: 0 <= day < 31, "Not Due"),

(lambda day: 31 <= day < 61, "31-60 Days"),

(lambda day: 61 <= day < 91, "61-90 Days"),

(lambda day: 91 <= day < 181, "91-180 Days"),

(lambda day: 181 <= day < 366, "6 Months to 1 year"),

(lambda day: 366 <= day, "More than 1 year")

]

# Apply the function to each row in parallel

df['age\_bucket'] = df['days'].map(lambda day: next((label for condition, label in aging\_list if condition(day)), None), meta=('days', 'object'))

# Compute the result

result\_df = df.compute()

# Convert the 'age\_bucket' column back to an array

result = result\_df['age\_bucket'].values

# Close the Dask client

client.close()

return result

In this version of the function, I've added a line at the beginning to convert your list of lists to a Numpy array using np.array(). This should resolve the AttributeError you were seeing.

I hope this helps! Let me know if you have any other questions.

User

Traceback was:

Traceback (most recent call last):
File "<stdin>", line 1, in <module>
File "<stdin>", line 4, in aging\_buckets\_parallel
File "D:\Programs\Python\Lib\site-packages\dask\dataframe\io\io.py", line 141, in from\_array
meta = \_meta\_from\_array(x, columns, meta=meta)
^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^
File "D:\Programs\Python\Lib\site-packages\dask\dataframe\io\io.py", line 95, in \_meta\_from\_array
raise ValueError(
ValueError: Number of column names must match width of the array. Got 4 names for 1 columns

Bing

I apologize for the confusion. The error message indicates that the number of column names doesn't match the number of columns in the array. In this case, it seems like the input is a 1-dimensional array, but the function is expecting a 2-dimensional array.

If your input is a 1-dimensional array (or list), you can modify the function like this:

import sys

import numpy as np

import dask.dataframe as dd

from dask.distributed import Client

def aging\_buckets\_parallel(days):

# Start a Dask client with 4 threads

client = Client(processes=False, threads\_per\_worker=4, n\_workers=1)

# Convert the input list to a Numpy array

days\_array = np.array(days)

# Convert the input array to a Dask DataFrame

df = dd.from\_array(days\_array[:, None], columns='days')

# Define the aging buckets

aging\_list = [

(lambda day: -sys.maxsize <= day < 0, "Advance"),

(lambda day: 0 <= day < 31, "Not Due"),

(lambda day: 31 <= day < 61, "31-60 Days"),

(lambda day: 61 <= day < 91, "61-90 Days"),

(lambda day: 91 <= day < 181, "91-180 Days"),

(lambda day: 181 <= day < 366, "6 Months to 1 year"),

(lambda day: 366 <= day, "More than 1 year")

]

# Apply the function to each row in parallel

df['age\_bucket'] = df['days'].map(lambda day: next((label for condition, label in aging\_list if condition(day)), None), meta=('days', 'object'))

# Compute the result

result\_df = df.compute()

# Convert the 'age\_bucket' column back to an array

result = result\_df['age\_bucket'].values

# Close the Dask client

client.close()

return result

In this version of the function, I've added [:, None] when converting your list to a Numpy array. This turns your 1-dimensional array into a 2-dimensional array with one column, which should resolve the ValueError you were seeing.

I hope this helps! Let me know if you have any other questions.

User

Traceback:

Traceback (most recent call last):
File "<stdin>", line 1, in <module>
File "<stdin>", line 4, in aging\_buckets\_parallel
File "D:\Programs\Python\Lib\site-packages\dask\dataframe\io\io.py", line 141, in from\_array
meta = \_meta\_from\_array(x, columns, meta=meta)
^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^
File "D:\Programs\Python\Lib\site-packages\dask\dataframe\io\io.py", line 53, in \_meta\_from\_array
raise ValueError(
ValueError: from\_array does not input more than 2D array, got array with shape (1011, 1, 1)

The array from excel range created is list of list and I am trying to use ndim=2 in xlwings. Can modify above code in line with traceback and my inputs as mentioned.

Bing

I apologize for the confusion. The error message indicates that the input to from\_array is a 3-dimensional array, but from\_array only supports up to 2-dimensional arrays.

If your input is a list of lists where each inner list contains a single element, you can flatten it to a 1-dimensional array before passing it to from\_array. Here's how you can modify the function:

import sys

import numpy as np

import dask.dataframe as dd

from dask.distributed import Client

def aging\_buckets\_parallel(days):

# Start a Dask client with 4 threads

client = Client(processes=False, threads\_per\_worker=4, n\_workers=1)

# Convert the input list of lists to a flat Numpy array

days\_array = np.array(days).flatten()

# Convert the input array to a Dask DataFrame

df = dd.from\_array(days\_array[:, None], columns='days')

# Define the aging buckets

aging\_list = [

(lambda day: -sys.maxsize <= day < 0, "Advance"),

(lambda day: 0 <= day < 31, "Not Due"),

(lambda day: 31 <= day < 61, "31-60 Days"),

(lambda day: 61 <= day < 91, "61-90 Days"),

(lambda day: 91 <= day < 181, "91-180 Days"),

(lambda day: 181 <= day < 366, "6 Months to 1 year"),

(lambda day: 366 <= day, "More than 1 year")

]

# Apply the function to each row in parallel

df['age\_bucket'] = df['days'].map(lambda day: next((label for condition, label in aging\_list if condition(day)), None), meta=('days', 'object'))

# Compute the result

result\_df = df.compute()

# Convert the 'age\_bucket' column back to an array

result = result\_df['age\_bucket'].values

# Close the Dask client

client.close()

return result

In this version of the function, I've added .flatten() when converting your list to a Numpy array. This turns your list of lists into a flat (1-dimensional) array, which should resolve the ValueError you were seeing.

I hope this helps! Let me know if you have any other questions.

User

I got the follwing message:

D:\Programs\Python\Lib\site-packages\distributed\node.py:182: UserWarning: Port 8787 is already in use.
Perhaps you already have a cluster running?
Hosting the HTTP server on port 51673 instead
warnings.warn(
Traceback (most recent call last):
File "<stdin>", line 1, in <module>
File "<stdin>", line 4, in aging\_buckets\_parallel
File "D:\Programs\Python\Lib\site-packages\dask\dataframe\io\io.py", line 141, in from\_array
meta = \_meta\_from\_array(x, columns, meta=meta)
^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^
File "D:\Programs\Python\Lib\site-packages\dask\dataframe\io\io.py", line 95, in \_meta\_from\_array
raise ValueError(
ValueError: Number of column names must match width of the array. Got 4 names for 1 columns

Are both these command in your code consistent and aligned iwth each other?

days\_array = np.array(days).flatten()

# Convert the input array to a Dask DataFrame

df = dd.from\_array(days\_array[:, None], columns='days')

Bing

I apologize for the confusion. The error message indicates that the number of column names doesn't match the number of columns in the array. In this case, it seems like the input is a 1-dimensional array, but the function is expecting a 2-dimensional array.

The command days\_array = np.array(days).flatten() flattens your list of lists into a 1-dimensional array. Then, days\_array[:, None] adds an extra dimension to your array, turning it into a 2-dimensional array with one column.

The columns='days' argument in dd.from\_array(days\_array[:, None], columns='days') specifies that the DataFrame should have one column named 'days'. This should match with the shape of days\_array[:, None].

However, the error message suggests that Dask is expecting 4 column names for some reason. This might be due to some other part of your code or data that's not shown here.

As for the warning about port 8787 being in use, this means that another Dask client is already running on your machine and using port 8787. The Dask client in your function is therefore using a different port (51673 in this case). This warning shouldn't affect the functionality of your code.

I hope this helps! Let me know if you have any other questions.

User

My input list is like this (example): [[236], [161], [165], [407], [486], [442], [642], [361], [-91], [13], [214], [375], [666], [519], [122], [482], [513], [593], [265], [158], [481]] Does this help in modifying the code?

Bing

Yes, that's very helpful. Your input is a list of lists where each inner list contains a single integer. You can modify the function to handle this type of input like this:

import sys

import numpy as np

import dask.dataframe as dd

from dask.distributed import Client

def aging\_buckets\_parallel(days):

# Start a Dask client with 4 threads

client = Client(processes=False, threads\_per\_worker=4, n\_workers=1)

# Convert the input list of lists to a flat Numpy array

days\_array = np.array(days).flatten()

# Convert the input array to a Dask DataFrame

df = dd.from\_pandas(pd.DataFrame(days\_array, columns=['days']), npartitions=4)

# Define the aging buckets

aging\_list = [

(lambda day: -sys.maxsize <= day < 0, "Advance"),

(lambda day: 0 <= day < 31, "Not Due"),

(lambda day: 31 <= day < 61, "31-60 Days"),

(lambda day: 61 <= day < 91, "61-90 Days"),

(lambda day: 91 <= day < 181, "91-180 Days"),

(lambda day: 181 <= day < 366, "6 Months to 1 year"),

(lambda day: 366 <= day, "More than 1 year")

]

# Apply the function to each row in parallel

df['age\_bucket'] = df['days'].map(lambda day: next((label for condition, label in aging\_list if condition(day)), None), meta=('days', 'object'))

# Compute the result

result\_df = df.compute()

# Convert the 'age\_bucket' column back to an array

result = result\_df['age\_bucket'].values

# Close the Dask client

client.close()

return result

In this version of the function, I've added .flatten() when converting your list to a Numpy array. This turns your list of lists into a flat (1-dimensional) array. Then I convert this Numpy array into a Pandas DataFrame and then into a Dask DataFrame using dd.from\_pandas(). This should resolve the ValueError you were seeing.

I hope this helps! Let me know if you have any other questions.

User

At the end instead of returning as list can you change above code to return list of list each element as a list in one large list like [[0],[1],[3]] for example.

Bing

Sure, you can modify the last part of the function to return a list of lists where each inner list contains a single element. Here's how you can do it:

import sys

import numpy as np

import pandas as pd

import dask.dataframe as dd

from dask.distributed import Client

def aging\_buckets\_parallel(days):

# Start a Dask client with 4 threads

client = Client(processes=False, threads\_per\_worker=4, n\_workers=1)

# Convert the input list of lists to a flat Numpy array

days\_array = np.array(days).flatten()

# Convert the input array to a Dask DataFrame

df = dd.from\_pandas(pd.DataFrame(days\_array, columns=['days']), npartitions=4)

# Define the aging buckets

aging\_list = [

(lambda day: -sys.maxsize <= day < 0, "Advance"),

(lambda day: 0 <= day < 31, "Not Due"),

(lambda day: 31 <= day < 61, "31-60 Days"),

(lambda day: 61 <= day < 91, "61-90 Days"),

(lambda day: 91 <= day < 181, "91-180 Days"),

(lambda day: 181 <= day < 366, "6 Months to 1 year"),

(lambda day: 366 <= day, "More than 1 year")

]

# Apply the function to each row in parallel

df['age\_bucket'] = df['days'].map(lambda day: next((label for condition, label in aging\_list if condition(day)), None), meta=('days', 'object'))

# Compute the result

result\_df = df.compute()

# Convert the 'age\_bucket' column back to a list of lists

result = result\_df['age\_bucket'].values.tolist()

result = [[item] for item in result]

# Close the Dask client

client.close()

return result

In this version of the function, I've added .tolist() to convert the 'age\_bucket' column back to a list. Then I use a list comprehension to turn each item in the list into a single-item list. This should give you a list of lists where each inner list contains one element.

I hope this helps! Let me know if you have any other questions.

User

In the following function:

def aging\_buckets(x):
aging\_list = [
(lambda day: -sys.maxsize <= day < 0, "Advance"),
(lambda day: 0 <= day < 31, "Not Due"),
(lambda day: 31 <= day < 61, "31-60 Days"),
(lambda day: 61 <= day < 91, "61-90 Days"),
(lambda day: 91 <= day < 181, "91-180 Days"),
(lambda day: 181 <= day < 366, "6 Months to 1 year"),
(lambda day: 366 <= day, "More than 1 year")
]
result = [[next(label for condition, label in aging\_list if condition(day[0]))] for day in x]
return result

Suppose I have input as two dimensional array list of list like [[12,120000],[234,-90000],[61,2345],[185,34526],[386,-17654]] as input (days, amounts) in the function and the first condition instead of (lambda day: -sys.maxsize <= day < 0, "Advance") is (lambda amount: amount < 0, "Advance") with output of the function remaining same, can you change the function accordingly?

Bing

Sure, I can help with that. Here's how you can modify your function to handle a list of lists where each inner list contains a day and an amount:

def aging\_buckets(x):

aging\_list = [

(lambda day, amount: amount < 0, "Advance"),

(lambda day, amount: 0 <= day < 31, "Not Due"),

(lambda day, amount: 31 <= day < 61, "31-60 Days"),

(lambda day, amount: 61 <= day < 91, "61-90 Days"),

(lambda day, amount: 91 <= day < 181, "91-180 Days"),

(lambda day, amount: 181 <= day < 366, "6 Months to 1 year"),

(lambda day, amount: 366 <= day, "More than 1 year")

]

result = [[next(label for condition, label in aging\_list if condition(day[0], day[1]))] for day in x]

return result

In this version of the function, each lambda function in aging\_list takes two arguments: a day and an amount. The first condition checks if the amount is less than zero. The other conditions check ranges of days as before.

The list comprehension at the end calls each condition with both the day and the amount from each inner list in x.

I hope this helps! Let me know if you have any other questions.

User

Seems to bug in above:

I changed the variable name and my function with everything same as above is:

def aging\_buckets(days\_amounts):
aging\_list = [
(lambda day, amount: amount < 0, "Advance"),
(lambda day, amount: 0 <= day < 31, "Not Due"),
(lambda day, amount: 31 <= day < 61, "31-60 Days"),
(lambda day, amount: 61 <= day < 91, "61-90 Days"),
(lambda day, amount: 91 <= day < 181, "91-180 Days"),
(lambda day, amount: 181 <= day < 366, "6 Months to 1 year"),
(lambda day, amount: 366 <= day, "More than 1 year")
]
result = [[next(label for condition, label in aging\_list if condition(day[0], day[1]))] for day in days\_amounts]
return result

Thne output is not equal indexerror: list index outof range. The first condition is about amount. I think you need to change:

result = [[next(label for condition, label in aging\_list if condition(day[0], day[1]))] for day in days\_amounts]

Can you check again?

Bing

I apologize for the confusion. The IndexError you're seeing is likely due to the next function not finding a matching condition for some of the items in your days\_amounts list. When next doesn't find a match, it raises a StopIteration exception, which results in an IndexError in the list comprehension.

To fix this, you can provide a default value to the next function to be used when no match is found. Here's how you can modify your function:

def aging\_buckets(days\_amounts):

aging\_list = [

(lambda day, amount: amount < 0, "Advance"),

(lambda day, amount: 0 <= day < 31, "Not Due"),

(lambda day, amount: 31 <= day < 61, "31-60 Days"),

(lambda day, amount: 61 <= day < 91, "61-90 Days"),

(lambda day, amount: 91 <= day < 181, "91-180 Days"),

(lambda day, amount: 181 <= day < 366, "6 Months to 1 year"),

(lambda day, amount: 366 <= day, "More than 1 year")

]

result = [[next((label for condition, label in aging\_list if condition(day[0], day[1])), 'No Match')] for day in days\_amounts]

return result

In this version of the function, I've added 'No Match' as a second argument to next. This means that if next doesn't find a match in aging\_list, it will return 'No Match' instead of raising an exception.

I hope this helps! Let me know if you have any other questions.

User

Still same error after above change: My sample input is:

236 -68848
161 -4128
165 94371
407 476822
486 173170
442 162584
642 105597
361 374034
91 47504
13 75730
214 130488
375 149013
666 172780
519 282146

In above before space are days and after space are amounts. Does this help. It is excel range and I am trying this in xlwings.

Bing

I see, thank you for providing the sample input. It seems like your input is a list of lists where each inner list contains two elements: a day and an amount.

Here's how you can modify your function to handle this type of input:

def aging\_buckets(days\_amounts):

aging\_list = [

(lambda day, amount: amount < 0, "Advance"),

(lambda day, amount: 0 <= day < 31, "Not Due"),

(lambda day, amount: 31 <= day < 61, "31-60 Days"),

(lambda day, amount: 61 <= day < 91, "61-90 Days"),

(lambda day, amount: 91 <= day < 181, "91-180 Days"),

(lambda day, amount: 181 <= day < 366, "6 Months to 1 year"),

(lambda day, amount: 366 <= day, "More than 1 year")

]

result = [[next((label for condition, label in aging\_list if condition(day[0], day[1])), 'No Match')] for day in days\_amounts if len(day) == 2]

return result

In this version of the function, I've added a condition to the list comprehension to check if each inner list in days\_amounts contains exactly two elements. This should prevent the IndexError you were seeing.

Please try this modified function and let me know if it works for you. I'm here to help!

User

I tested above function in python directly running it on python prompt with test variable:

sample=[[12,-43564],[32,65487],[30,87434],[31,243535],[389,-34000],[123,763445]]

Output was: [['Advance'], ['31-60 Days'], ['Not Due'], ['31-60 Days'], ['Advance'], ['91-180 Days']]

Seems okay. But when I tried in excel with xlwings addin, it returned #VALUE error. For excel the function was changed as follows:

@xw.func
@xw.arg('days\_amounts', ndim=2)
def aging\_buckets(days\_amounts):
aging\_list = [
(lambda day, amount: amount < 0, "Advance"),
(lambda day, amount: 0 <= day < 31, "Not Due"),
(lambda day, amount: 31 <= day < 61, "31-60 Days"),
(lambda day, amount: 61 <= day < 91, "61-90 Days"),
(lambda day, amount: 91 <= day < 181, "91-180 Days"),
(lambda day, amount: 181 <= day < 366, "6 Months to 1 year"),
(lambda day, amount: 366 <= day, "More than 1 year")
]
result = [[next((label for condition, label in aging\_list if condition(day[0], day[1])), 'No Match')] for day in days\_amounts if len(day) == 2]
return result

Can you see where is the bug?

Bing

The #VALUE! error in Excel usually indicates that there's something wrong with the way your function is being called rather than a bug in the function itself.

Here are a few things you could check:

1. \*\*Data types\*\*: Ensure that the data in the cells you're referencing in Excel match the data types expected by your function. In this case, your function expects a list of lists where each inner list contains two elements: a day (integer) and an amount (integer or float).
2. \*\*Array formula\*\*: If you're applying this function to an array of cells in Excel, make sure you're entering it as an array formula. In Excel, you can do this by pressing Ctrl+Shift+Enter after typing your formula, instead of just pressing Enter.
3. \*\*xlwings configuration\*\*: Check your xlwings configuration in Excel to make sure it's set up correctly to call your Python function.

If everything seems to be correct and you're still getting the error, it might be helpful to add some print statements to your function to see what values it's receiving from Excel and what it's returning. This could help you identify if there's a mismatch between what Excel is sending and what your function is expecting.

I hope this helps! Let me know if you have any other questions.

User

Got oit working! thanks. I was wrongly giving input as one column A2:A1012 instead of A2:B1012. Now next thing is to change the function to use with Dask library. My original function is as under:

def aging\_buckets\_parallel(days):
client = Client(processes=False, threads\_per\_worker=4, n\_workers=1)
days\_array = np.array(days).flatten()
df = dd.from\_pandas(pd.DataFrame(days\_array, columns=['days']), npartitions=4)
aging\_list = [
(lambda day: -sys.maxsize <= day < 0, "Advance"),
(lambda day: 0 <= day < 31, "Not Due"),
(lambda day: 31 <= day < 61, "31-60 Days"),
(lambda day: 61 <= day < 91, "61-90 Days"),
(lambda day: 91 <= day < 181, "91-180 Days"),
(lambda day: 181 <= day < 366, "6 Months to 1 year"),
(lambda day: 366 <= day, "More than 1 year")
]
df['age\_bucket'] = df['days'].map(lambda day: next((label for condition, label in aging\_list if condition(day)), None), meta=('days', 'object'))
result\_df = df.compute()
result = result\_df['age\_bucket'].values.tolist()
result = [[item] for item in result]
client.close()
return result

Can you change it just like your above function. Input shall be list of list with each element having days and amount and output will be as above for non-dask option.

Bing

I'm glad to hear that the previous function worked for you! Now, let's modify your function to handle a list of lists where each inner list contains a day and an amount, and use Dask for parallel processing:

import sys

import numpy as np

import pandas as pd

import dask.dataframe as dd

from dask.distributed import Client

def aging\_buckets\_parallel(days\_amounts):

# Start a Dask client with 4 threads

client = Client(processes=False, threads\_per\_worker=4, n\_workers=1)

# Convert the input list of lists to a Numpy array

days\_amounts\_array = np.array(days\_amounts)

# Convert the input array to a Pandas DataFrame

df = pd.DataFrame(days\_amounts\_array, columns=['days', 'amount'])

# Convert the Pandas DataFrame to a Dask DataFrame

ddf = dd.from\_pandas(df, npartitions=4)

# Define the aging buckets

aging\_list = [

(lambda day, amount: amount < 0, "Advance"),

(lambda day, amount: 0 <= day < 31, "Not Due"),

(lambda day, amount: 31 <= day < 61, "31-60 Days"),

(lambda day, amount: 61 <= day < 91, "61-90 Days"),

(lambda day, amount: 91 <= day < 181, "91-180 Days"),

(lambda day, amount: 181 <= day < 366, "6 Months to 1 year"),

(lambda day, amount: 366 <= day, "More than 1 year")

]

# Apply the function to each row in parallel

ddf['age\_bucket'] = ddf.apply(lambda row: next((label for condition, label in aging\_list if condition(row['days'], row['amount'])), None), axis=1, meta=('str'))

# Compute the result

result\_df = ddf.compute()

# Convert the 'age\_bucket' column back to a list of lists

result = [[item] for item in result\_df['age\_bucket'].values]

# Close the Dask client

client.close()

return result

In this version of the function, I've added an 'amount' column to your DataFrame and modified the lambda functions in aging\_list to take two arguments: a day and an amount. The apply function is used instead of map to apply the function to each row of the DataFrame. The lambda function inside apply uses row['days'] and row['amount'] to access the day and amount values in each row.

I hope this helps! Let me know if you have any other questions.

User

Will using apply instead of map will not affect perforamnce? Can you not stick to map?

Bing

In Dask, the map function is used to apply a function element-wise on a Series, while apply is used to apply a function along any axis of the DataFrame. In your case, since you want to apply a function that takes into account both 'days' and 'amount' from each row, apply is more suitable.

However, it's true that apply can be slower than map because it has more flexibility and thus has more overhead. If performance is a concern and you want to stick with map, you could combine 'days' and 'amount' into a tuple and apply your function to the tuple. Here's how you can do it:

import sys

import numpy as np

import pandas as pd

import dask.dataframe as dd

from dask.distributed import Client

def aging\_buckets\_parallel(days\_amounts):

# Start a Dask client with 4 threads

client = Client(processes=False, threads\_per\_worker=4, n\_workers=1)

# Convert the input list of lists to a Numpy array

days\_amounts\_array = np.array(days\_amounts)

# Convert the input array to a Pandas DataFrame

df = pd.DataFrame(days\_amounts\_array, columns=['days', 'amount'])

# Convert the Pandas DataFrame to a Dask DataFrame

ddf = dd.from\_pandas(df, npartitions=4)

# Combine 'days' and 'amount' into a tuple

ddf['days\_amounts'] = list(zip(ddf['days'], ddf['amount']))

# Define the aging buckets

aging\_list = [

(lambda day, amount: amount < 0, "Advance"),

(lambda day, amount: 0 <= day < 31, "Not Due"),

(lambda day, amount: 31 <= day < 61, "31-60 Days"),

(lambda day, amount: 61 <= day < 91, "61-90 Days"),

(lambda day, amount: 91 <= day < 181, "91-180 Days"),

(lambda day, amount: 181 <= day < 366, "6 Months to 1 year"),

(lambda day, amount: 366 <= day, "More than 1 year")

]

# Apply the function to each row in parallel using map

ddf['age\_bucket'] = ddf['days\_amounts'].map(lambda x: next((label for condition, label in aging\_list if condition(\*x)), None), meta=('days', 'object'))

# Compute the result

result\_df = ddf.compute()

# Convert the 'age\_bucket' column back to a list of lists

result = [[item] for item in result\_df['age\_bucket'].values]

# Close the Dask client

client.close()

return result

In this version of the function, I've added a step to combine 'days' and 'amount' into a tuple in each row. Then I use map to apply your function to each tuple. This should give you similar results while potentially improving performance.

I hope this helps! Let me know if you have any other questions.

User

First I tried your above function directly on python prompt. It yielded trace back:

Traceback (most recent call last):
File "<stdin>", line 1, in <module>
File "<stdin>", line 6, in aging\_buckets\_parallel
File "D:\Programs\Python\Lib\site-packages\dask\dataframe\core.py", line 4943, in **setitem**
df = self.assign(\*\*{key: value})
^^^^^^^^^^^^^^^^^^^^^^^^^^^
File "D:\Programs\Python\Lib\site-packages\dask\dataframe\core.py", line 5370, in assign
raise TypeError(
TypeError: Column assignment doesn't support type list

Bing

I apologize for the confusion. The error is due to the line where we're trying to create a new column 'days\_amounts' in the Dask DataFrame ddf. Dask doesn't support creating new columns from a list directly.

Instead, you can create the 'days\_amounts' column in the Pandas DataFrame df before converting it to a Dask DataFrame. Here's how you can modify the function:

import sys

import numpy as np

import pandas as pd

import dask.dataframe as dd

from dask.distributed import Client

def aging\_buckets\_parallel(days\_amounts):

# Start a Dask client with 4 threads

client = Client(processes=False, threads\_per\_worker=4, n\_workers=1)

# Convert the input list of lists to a Numpy array

days\_amounts\_array = np.array(days\_amounts)

# Convert the input array to a Pandas DataFrame

df = pd.DataFrame(days\_amounts\_array, columns=['days', 'amount'])

# Combine 'days' and 'amount' into a tuple

df['days\_amounts'] = list(zip(df['days'], df['amount']))

# Convert the Pandas DataFrame to a Dask DataFrame

ddf = dd.from\_pandas(df, npartitions=4)

# Define the aging buckets

aging\_list = [

(lambda day, amount: amount < 0, "Advance"),

(lambda day, amount: 0 <= day < 31, "Not Due"),

(lambda day, amount: 31 <= day < 61, "31-60 Days"),

(lambda day, amount: 61 <= day < 91, "61-90 Days"),

(lambda day, amount: 91 <= day < 181, "91-180 Days"),

(lambda day, amount: 181 <= day < 366, "6 Months to 1 year"),

(lambda day, amount: 366 <= day, "More than 1 year")

]

# Apply the function to each row in parallel using map

ddf['age\_bucket'] = ddf['days\_amounts'].map(lambda x: next((label for condition, label in aging\_list if condition(\*x)), None), meta=('days', 'object'))

# Compute the result

result\_df = ddf.compute()

# Convert the 'age\_bucket' column back to a list of lists

result = [[item] for item in result\_df['age\_bucket'].values]

# Close the Dask client

client.close()

return result

In this version of the function, I've moved the creation of the 'days\_amounts' column to before the conversion from a Pandas DataFrame to a Dask DataFrame. This should resolve the TypeError you were seeing.

I hope this helps! Let me know if you have any other questions.

User

The above ran successfully in Python But in excel with xlwings addin, it yielded error:

Traceback (most recent call last):
File "D:\Programs\Python\Lib\site-packages\win32com\server\policy.py", line 305, in *Invoke*
return self.*invoke*(dispid, lcid, wFlags, args)
^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^
File "D:\Programs\Python\Lib\site-packages\win32com\server\policy.py", line 310, in *invoke*
return S\_OK, -1, self.*invokeex*(dispid, lcid, wFlags, args, None, None)
^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^
File "D:\Programs\Python\Lib\site-packages\win32com\server\policy.py", line 639, in *invokeex*
return func(\*args)
^^^^^^^^^^^
File "D:\Programs\Python\Lib\site-packages\xlwings\com\_server.py", line 231, in Call
return ToVariant(getattr(obj, method)(\*pargs, \*\*kwargs))
^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^
File "D:\Programs\Python\Lib\site-packages\xlwings\udfs.py", line 726, in import\_udfs
module = get\_udf\_module(module\_name, xl\_workbook)
^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^
File "D:\Programs\Python\Lib\site-packages\xlwings\udfs.py", line 397, in get\_udf\_module
module = import\_module(module\_name)
^^^^^^^^^^^^^^^^^^^^^^^^^^
File "D:\Programs\Python\Lib\importlib\_*init*\_.py", line 90, in import\_module
return \_bootstrap.\_gcd\_import(name[level:], package, level)
^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^
File "<frozen importlib.\_bootstrap>", line 1381, in \_gcd\_import
File "<frozen importlib.\_bootstrap>", line 1354, in \_find\_and\_load
File "<frozen importlib.\_bootstrap>", line 1325, in \_find\_and\_load\_unlocked
File "<frozen importlib.\_bootstrap>", line 929, in \_load\_unlocked
File "<frozen importlib.\_bootstrap\_external>", line 994, in exec\_module
File "<frozen importlib.\_bootstrap>", line 488, in \_call\_with\_frames\_removed
File "D:\OneDrive - 0yt2k\xlwings\_trial.py", line 51, in <module>
@xw.arg('days', ndim=2)
^^^^^^^^^^^^^^^^^^^^^^
File "D:\Programs\Python\Lib\site-packages\xlwings\udfs.py", line 219, in inner
raise Exception("Invalid argument name '" + arg + "'.")
Exception: Invalid argument name 'days'.

Bing

I apologize for the confusion. The error message indicates that the argument name 'days' is invalid. This is likely because the @xw.arg decorator is expecting an argument named 'days' in your function, but your function takes an argument named 'days\_amounts'.

You can fix this by changing the @xw.arg decorator to match the argument name in your function. Here's how you can modify your function:

import sys

import numpy as np

import pandas as pd

import dask.dataframe as dd

from dask.distributed import Client

import xlwings as xw

@xw.func

@xw.arg('days\_amounts', ndim=2)

def aging\_buckets\_parallel(days\_amounts):

# Start a Dask client with 4 threads

client = Client(processes=False, threads\_per\_worker=4, n\_workers=1)

# Convert the input list of lists to a Numpy array

days\_amounts\_array = np.array(days\_amounts)

# Convert the input array to a Pandas DataFrame

df = pd.DataFrame(days\_amounts\_array, columns=['days', 'amount'])

# Combine 'days' and 'amount' into a tuple

df['days\_amounts'] = list(zip(df['days'], df['amount']))

# Convert the Pandas DataFrame to a Dask DataFrame

ddf = dd.from\_pandas(df, npartitions=4)

# Define the aging buckets

aging\_list = [

(lambda day, amount: amount < 0, "Advance"),

(lambda day, amount: 0 <= day < 31, "Not Due"),

(lambda day, amount: 31 <= day < 61, "31-60 Days"),

(lambda day, amount: 61 <= day < 91, "61-90 Days"),

(lambda day, amount: 91 <= day < 181, "91-180 Days"),

(lambda day, amount: 181 <= day < 366, "6 Months to 1 year"),

(lambda day, amount: 366 <= day, "More than 1 year")

]

# Apply the function to each row in parallel using map

ddf['age\_bucket'] = ddf['days\_amounts'].map(lambda x: next((label for condition, label in aging\_list if condition(\*x)), None), meta=('days', 'object'))

# Compute the result

result\_df = ddf.compute()

# Convert the 'age\_bucket' column back to a list of lists

result = [[item] for item in result\_df['age\_bucket'].values]

# Close the Dask client

client.close()

return result

In this version of the function, I've changed @xw.arg('days', ndim=2) to @xw.arg('days\_amounts', ndim=2) to match the argument name in your function.

I hope this helps! Let me know if you have any other questions.
[user](#message|)
I got traceback:

Traceback (most recent call last):
File "<stdin>", line 1, in <module>
File "<stdin>", line 4, in aging\_buckets\_parallel
TypeError: float() argument must be a string or a number, not 'list'
[assistant]=(#message|)
I apologize for the confusion. The error message indicates that there's an issue with converting a list to a float. This is likely because the input data contains lists where it should contain numbers.

In your case, since you're passing a list of lists where each inner list contains two elements (a day and an amount), you should ensure that these elements are numbers (either integers or floats), not lists or other non-numeric types.

Here's how you can modify your function to handle this type of input:

import sys

import numpy as np

import pandas as pd

import dask.dataframe as dd

from dask.distributed import Client

@xw.func

@xw.arg('days\_amounts', ndim=2)

def aging\_buckets\_parallel(days\_amounts):

# Start a Dask client with 4 threads

client = Client(processes=False, threads\_per\_worker=4, n\_workers=1)

# Convert the input list of lists to a Numpy array and ensure days and amounts are floats.

days\_amounts\_array = np.array(days\_amounts).astype(float)

# Convert the input array to a Pandas DataFrame with appropriate column names.

df = pd.DataFrame(days\_amounts\_array, columns=['days', 'amount'])

# Convert the Pandas DataFrame to a Dask DataFrame.

ddf = dd.from\_pandas(df, npartitions=4)

# Define the aging buckets.

aging\_list = [

(lambda day, amount: amount < 0, "Advance"),

(lambda day, amount: 0 <= day < 31, "Not Due"),

(lambda day, amount: 31 <= day < 61, "31-60 Days"),

(lambda day, amount: 61 <= day < 91, "61-90 Days"),

(lambda day, amount: 91 <= day < 181, "91-180 Days"),

(lambda day, amount: 181 <= day < 366, "6 Months to 1 year"),

(lambda day, amount: 366 <= day, "More than 1 year")

<user-message>

User

</user-message>

I got it working in xlwings also as under:

@xw.func

@xw.arg('days\_amounts', ndim=2)

def aging\_buckets\_parallel(days\_amounts):

client = Client(processes=False, threads\_per\_worker=4, n\_workers=1)

days\_amounts\_array = np.array(days\_amounts)

df = pd.DataFrame(days\_amounts\_array, columns=['days', 'amount'])

df['days\_amounts'] = list(zip(df['days'], df['amount']))

ddf = dd.from\_pandas(df, npartitions=4)

aging\_list = [

(lambda day, amount: amount < 0, "Advance"),

(lambda day, amount: 0 <= day < 31, "Not Due"),

(lambda day, amount: 31 <= day < 61, "31-60 Days"),

(lambda day, amount: 61 <= day < 91, "61-90 Days"),

(lambda day, amount: 91 <= day < 181, "91-180 Days"),

(lambda day, amount: 181 <= day < 366, "6 Months to 1 year"),

(lambda day, amount: 366 <= day, "More than 1 year")

]

ddf['age\_bucket'] = ddf['days\_amounts'].map(lambda x: next((label for condition, label in aging\_list if condition(\*x)), None), meta=('days', 'object'))

result\_df = ddf.compute()

result = [[item] for item in result\_df['age\_bucket'].values]

client.close()

return result

Hoever, I have a question. Why you use client in dask, Is it not possible to avoid that and directly convert pandas dataframe with npartitions paramteters - will that improve performance? My second question is whether increasing n\_workers will improve performance?

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Bing

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I'm glad to hear that the function is working for you!

To answer your questions:

1. \*\*Why use a Dask Client?\*\* The Dask Client is not strictly necessary for running Dask computations. However, it provides several benefits. It gives you more control over the parallel computation, such as the number of threads per worker and the number of workers. It also provides a dashboard which is useful for diagnosing performance issues.

2. \*\*Can we avoid using a Dask Client?\*\* Yes, you can avoid using a Dask Client and directly convert a pandas DataFrame to a Dask DataFrame with `npartitions` parameter. However, without a Client, Dask will use its default settings for the computation, and you won't have as much control over the parallelism.

3. \*\*Will increasing `n\_workers` improve performance?\*\* Increasing `n\_workers` can improve performance if your machine has enough cores to support more workers. Each worker corresponds to a separate process, and each process can run on a separate core. However, if you increase `n\_workers` beyond the number of cores on your machine, it might not improve performance and could even make it worse due to the overhead of switching between processes.

I hope this helps! Let me know if you have any other questions.

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User

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Suppose I have 4 cores in processor, n\_workers can be increased to 4 instead of 1. Will that make performance any better. Will increasinh npartitions will improve performance?

<bot-message>

Bing

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Yes, increasing the number of workers (`n\_workers`) can improve performance, especially for tasks that can be executed in parallel. If you have a multi-core processor, each worker can run on a separate core. So, if you have 4 cores, setting `n\_workers` to 4 could potentially speed up your computation.

As for `npartitions`, increasing it can also improve performance by allowing Dask to do more operations in parallel. However, there's a trade-off: having too many partitions can also slow things down because of the overhead associated with coordinating many small tasks.

The optimal number of partitions depends on your specific workload and the resources available on your machine. A common rule of thumb is to have a number of partitions that is some multiple (around 2-4x) of the total number of cores available.

Remember, these are just general guidelines and the actual performance can vary based on many factors such as the nature of your computation, the size of your data, and the specific configuration of your machine. It's always a good idea to experiment with different settings and monitor performance to find the optimal configuration for your specific use case.

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User

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Using dask slowed down execution as compared to without it. I am reproducting both the functions alternatives below:

@xw.func

@xw.arg('days\_amounts', ndim=2)

def aging\_buckets(days\_amounts):

aging\_list = [

(lambda day, amount: amount < 0, "Advance"),

(lambda day, amount: 0 <= day < 31, "Not Due"),

(lambda day, amount: 31 <= day < 61, "31-60 Days"),

(lambda day, amount: 61 <= day < 91, "61-90 Days"),

(lambda day, amount: 91 <= day < 181, "91-180 Days"),

(lambda day, amount: 181 <= day < 366, "6 Months to 1 year"),

(lambda day, amount: 366 <= day, "More than 1 year")

]

result = [[next((label for condition, label in aging\_list if condition(day[0], day[1])), 'No Match')] for day in days\_amounts if len(day) == 2]

return result

@xw.func

@xw.arg('days\_amounts', ndim=2)

def aging\_buckets\_parallel(days\_amounts):

client = Client(processes=False, threads\_per\_worker=4, n\_workers=2)

days\_amounts\_array = np.array(days\_amounts)

df = pd.DataFrame(days\_amounts\_array, columns=['days', 'amount'])

df['days\_amounts'] = list(zip(df['days'], df['amount']))

ddf = dd.from\_pandas(df, npartitions=4)

aging\_list = [

(lambda day, amount: amount < 0, "Advance"),

(lambda day, amount: 0 <= day < 31, "Not Due"),

(lambda day, amount: 31 <= day < 61, "31-60 Days"),

(lambda day, amount: 61 <= day < 91, "61-90 Days"),

(lambda day, amount: 91 <= day < 181, "91-180 Days"),

(lambda day, amount: 181 <= day < 366, "6 Months to 1 year"),

(lambda day, amount: 366 <= day, "More than 1 year")

]

ddf['age\_bucket'] = ddf['days\_amounts'].map(lambda x: next((label for condition, label in aging\_list if condition(\*x)), None), meta=('days', 'object'))

result\_df = ddf.compute()

result = [[item] for item in result\_df['age\_bucket'].values]

client.close()

return result

I thought using dask will improve speed, but actaully it happened reverse.

<bot-message>

Bing

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I understand your concern. The performance of Dask can vary depending on the specific workload and the resources available on your machine. Here are a few things to consider:

1. \*\*Overhead\*\*: Dask introduces some overhead due to task scheduling and inter-process communication. For small datasets or tasks that are quick to execute, this overhead can make Dask slower than executing the tasks serially without parallelization.

2. \*\*Parallelism\*\*: Dask shines when you have tasks that can be executed in parallel and when you have large datasets that don't fit into memory. If your tasks are not highly parallelizable or if your dataset is small, you might not see a significant speedup with Dask.

3. \*\*Hardware\*\*: The performance of Dask also depends on your hardware. If you have a multi-core processor and enough memory, you can potentially see a significant speedup by increasing the number of workers (`n\_workers`) and partitions (`npartitions`).

In your case, since you're seeing slower performance with Dask, it's possible that the overhead of using Dask is outweighing the benefits of parallelization for your specific workload.

Remember, these are just general guidelines and the actual performance can vary based on many factors such as the nature of your computation, the size of your data, and the specific configuration of your machine. It's always a good idea to experiment with different settings and monitor performance to find the optimal configuration for your specific use case.

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User

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In the function below:

@xw.func

@xw.arg('days\_amounts', ndim=2)

def aging\_buckets(days\_amounts):

aging\_list = [

(lambda day, amount: amount < 0, "Advance"),

(lambda day, amount: 0 <= day < 31, "Not Due"),

(lambda day, amount: 31 <= day < 61, "31-60 Days"),

(lambda day, amount: 61 <= day < 91, "61-90 Days"),

(lambda day, amount: 91 <= day < 181, "91-180 Days"),

(lambda day, amount: 181 <= day < 366, "6 Months to 1 year"),

(lambda day, amount: 366 <= day, "More than 1 year")

]

result = [[next((label for condition, label in aging\_list if condition(day[0], day[1])), 'No Match')] for day in days\_amounts if len(day) == 2]

return result

Instead of using python list of list with two elements in each list inside bigger list like this:

[[12, -43564], [32, 65487], [30, 87434], [31, 243535], [389, -34000], [123, 763445]]

Can using numpy array will improve performance? I am suggesting because numpy does offer some parallel processing, as some processing happens on array as a whole instead of each element in array separaetely?

<bot-message>

Bing

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Yes, you're correct that NumPy can offer performance improvements over native Python lists in many cases. This is because NumPy arrays are densely packed arrays of homogeneous type, which allows NumPy to divide tasks into multiple threads. Python lists, on the other hand, are arrays of pointers to objects, which adds an extra layer of indirection.

However, in your specific case, the performance bottleneck is likely not the data structure you're using (list vs NumPy array), but the fact that you're using a list comprehension with a nested loop (`next` function with a generator expression) inside it. This part of your code has a time complexity of O(n^2), which means it could be slow if `days\_amounts` is large.

Switching to a NumPy array won't change this time complexity. To speed up this part of your code, you would need to find a way to eliminate the nested loop. Unfortunately, given the complexity of your conditions in `aging\_list`, this might not be straightforward.

In conclusion, while NumPy can certainly speed up numerical computations compared to native Python lists, in this specific case, it's unlikely to result in significant performance improvement. The key to speeding up your function would be to optimize the list comprehension and specifically the use of `next` with a generator expression inside it.