
crosstream
A **Python package**
for **joining** large datasets
across **servers**
**efficiently**

# BERT WAGNER

Data Scientist, YouTuber, Blogger

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DATA WITH BERT

YouTube

# MOVING MOUNTAINS

Joining datasets across servers is not easy

- Linked servers, PolyBase, etc…
- Move small data to the large data
- ETL servers

# WARNING

You should use the previous options if they are available

What follows is a great option when there is nothing else you can do

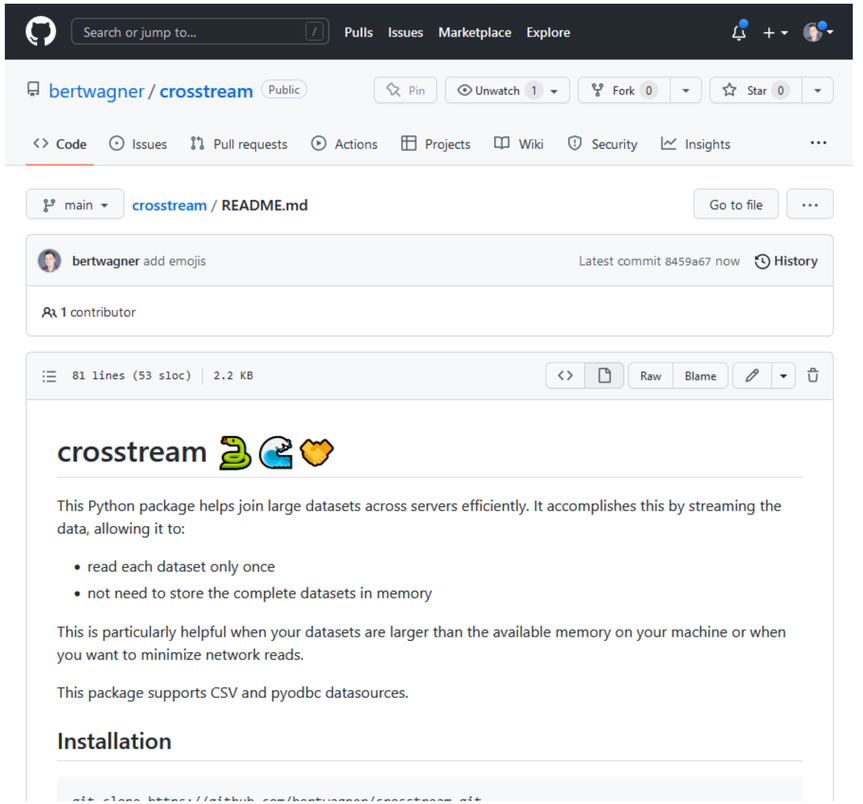
# CROSSTREAM

Install from PyPI:

```
pip install crosstream
```

Or from source:

```
git clone https://github.com/bertwagner/crosstream.git
cd crosstream
pip install .
```

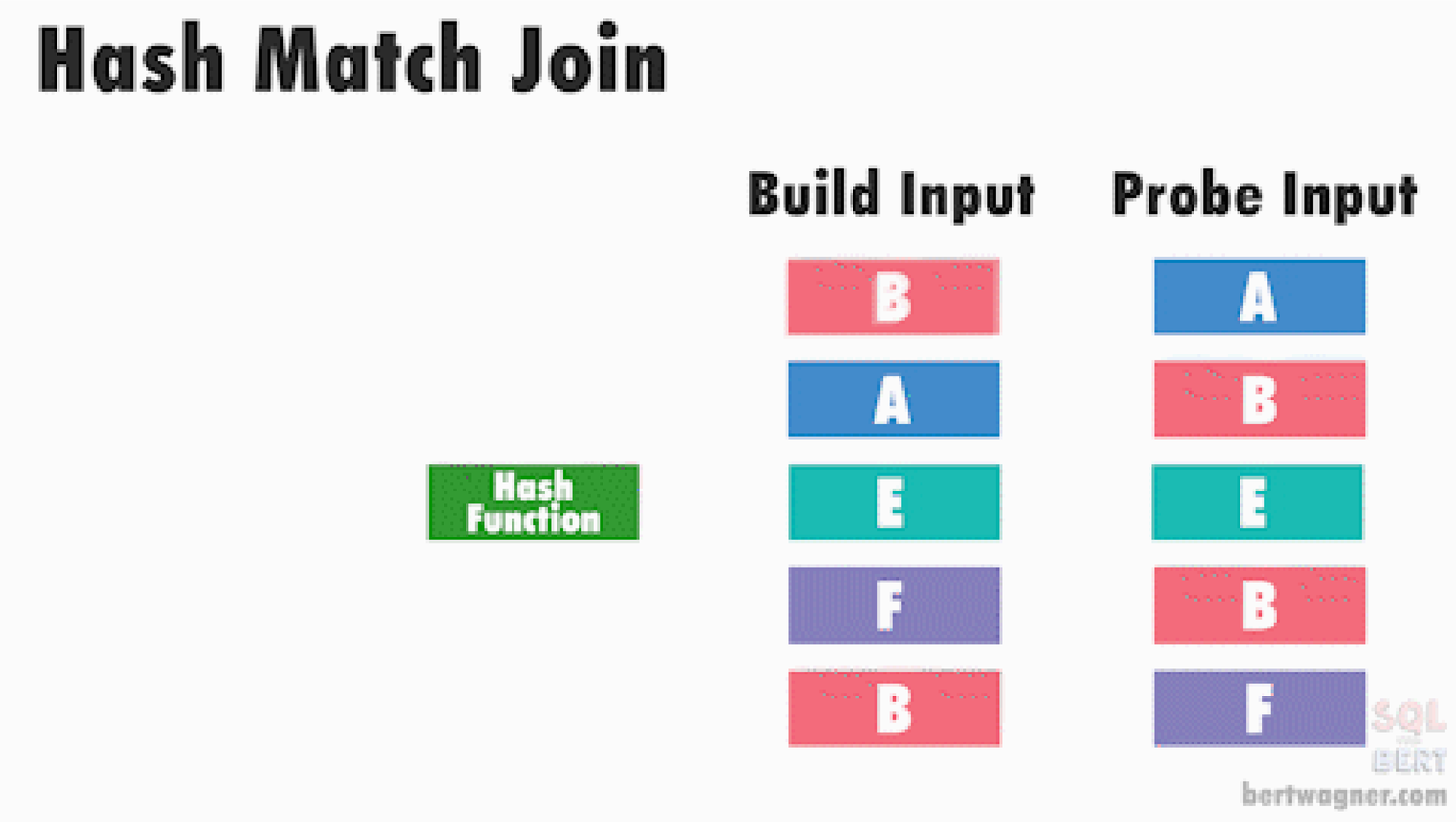



github.com/bertwagner/crosstream

# FEATURES

- Reads each dataset only once
- Does not store full datasets in memory or on disk
- Works on CSV files or anything ODBC
- Allows data transformations before equality comparisons
- Allows data transformations after matching

# INTERNALS




https://bertwagner.com/posts/hash-match-join-internals/

# DEMO:

# BASIC USAGE

```
from crosstream.hash_join import HashJoin
from crosstream.data_types import CSVData,QueryData
import csv

file1 = 'small_dataset.csv'
file2 = 'large_dataset.csv'

# join using column indexes or column names
c1=CSVData(file1,True,[0,1])
c2=CSVData(file2, True, ['col1','col2'])

# initialize the type of join to perform.
h=HashJoin()

# specify the output file
with open('joined_output.csv', 'w') as f:
    w =csv.writer(f)

    # write header column names
    w.writerow(c1.column_names + c2.column_names)

    for row_left,row_right in h.inner_join(c1,c2):
        # write matched results to our joined_output.csv
        w.writerow(row_left + row_right)
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# CUSTOM JOIN KEYS

```
# define a function for joining on criteria that is modified
before insert into hash table
def custom_join_key(row,indices):
    # calculate the hash of join values
    join_values = []
    for col_index in indices:
        # here we transform our join key, removing spaces
        join_values.append(str(row[col_index]).replace(' ',''))
    join_key = ''.join(join_values)

    return join_key


...
for row_left,row_right in
h.inner_join(c1,c2,override_build_join_key=custom_join_key):
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# CUSTOM MATCH PROCESSING

```
# define a function for performing additional transformations
or adding additional outputs before the columns are returned
def custom_process_matched_hashes(bucket_row,probe_row,
bucket_join_column_indexes, probe_join_column_indexes):
    # adding a new column indicating the weights of these
matches are equal to 1
    weight=1.0
    return tuple(bucket_row),tuple(probe_row),(weight,)


...
for row_left,row_right,weight in
h.inner_join(c1,c2,override_process_matched_hashes=custom_proce
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# THANK YOU!


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