tf idf cal

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Assignment 1: Data Analysis

Task 4: Calculate TF-IDF with MapReduce/Pig/Hive

1) Package Imports

```
[22]: from pyhive import hive import pandas as pd from sklearn.feature_extraction.text import TfidfVectorizer
```

2) Hive Connection setup

```
[23]: host="127.0.0.1"
    port=10000
    username="kaustubh_agawane2"
    password="5567170637024851622"
    conn = hive.Connection(host, port, username, password)
```

3) Finding top 10 users to calculate the per-user TF-IDF

```
[24]: data = pd.read_sql("select OwnerUserId, max(DisplayName) as Displayname, 

→sum(score) as score from stackexposts group by OwnerUserId order by score 

→desc limit 10", conn) 

display(data.iloc[:,[0,1]])
```

displayname	owneruserid	
${\tt GManNickG}$	87234	0
readonly	4883	1
e-satis	9951	2

```
3
          6068
                          pupeno
4
                Hamza Yerlikaya
         89904
5
         51816
                      Joan Venge
6
                              Ali
         49153
7
                            TIMEX
        179736
8
         95592
                  Matthew Rankin
9
         63051
                       flybywire
```

4) Selecting Post Titles for each of top 10 users

```
[25]: owner_user_id=list(data['owneruserid'])
    query=f"select owneruserid,displayname,body,title,score from stackexposts where
    →owneruserid in {tuple(owner_user_id)}"
    df = pd.read_sql(query, conn)
    df['Body-Title']=df['body'] + ' ' + df['title']
```

5) Function to calculate TF-IDF on post Title and finding top 10 terms for each of the top 10 user

Steps performed in below function Step 1 : Passing Title dataframe

Step 2 & Step 3 : TfidfVectorizer.fit_transform() function filters the stop words, cleans the data for unwanted characters and calculates TF-IDF on entire list of Title dataframe for each term.

Step 4: Creating a new dataframe after calculating TF-IDF

Step 5 : To find the top 10 terms, we use dataframe sum() function to sum TF-IDF for every term and using nlargest() function we find top 10 terms.

6) Displaying Top 10 terms TF-IDF for each of top 10 users

```
df2=calc_tf_idf(df1['Body-Title'])
       print("User ID:",extact_namer + "
                                                              Top 10 Words⊔
 →TF-IDF")
 →print("------
       df2.insert(0, 'displayname', extact_namer)
        display(df2)
User ID: GManNickG
                                        Top 10 Words TF-IDF
 displayname lt
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                      сору
                                 data
                                            int
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   GManNickG 0.431818 0.000000 0.51101 0.172727 0.000000 0.129546
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   GManNickG 0.126037 0.000000 0.00000 0.252073 0.000000 0.252073
2
   GManNickG 0.000000 0.523691 0.00000
                                        0.000000 0.418953 0.000000
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0
  0.252073
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                     0.000000 0.000000
  0.000000 0.314215
                     0.000000 0.079656
User ID: readonly
                                       Top 10 Words TF-IDF
  displayname
               python
                                                              branch
                          use
                                   ruby
                                             list
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     readonly 0.000000 0.000000
                                0.000000
                                          0.000000
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     readonly 0.000000 0.000000
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3
     readonly 0.000000 0.000000
                                0.413988
                                          0.000000
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4
     readonly 0.000000 0.000000 0.000000
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                                                            0.636117
5
     readonly 0.152171 0.174938 0.000000
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6
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13
     readonly 0.000000 0.000000
                                0.404077
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14
     readonly 0.101808
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                                0.000000
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15
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16
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     readonly 0.149597
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9
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10
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                                      0.389835
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31
    0.187678
                 0.000000
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32
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```

User ID: e-satis Top 10 Words TF-IDF

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displayname
                  python
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       e-satis
                0.000000
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                                                0.059616
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       e-satis
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2
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                0.525068
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       e-satis
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       e-satis
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7
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              0.654206
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                         0.173878
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16
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17
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      23
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      0.143203
```

User ID: pupeno Top 10 Words TF-IDF

	displayname	file	java	android	sql	git	way	\
0	pupeno	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
1	pupeno	0.000000	0.000000	0.000000	0.000000	0.728914	0.000000	
2	pupeno	0.000000	0.000000	0.130150	0.000000	0.000000	0.000000	
3	pupeno	0.000000	0.000000	0.174881	0.000000	0.000000	0.000000	
4	pupeno	0.000000	0.000000	0.000000	0.000000	0.000000	0.140540	
5	pupeno	0.000000	0.362108	0.000000	0.000000	0.000000	0.000000	
6	pupeno	0.000000	0.000000	0.275010	0.000000	0.000000	0.000000	
7	pupeno	0.000000	0.000000	0.000000	0.219137	0.000000	0.000000	
8	pupeno	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
9	pupeno	0.000000	0.000000	0.151689	0.000000	0.000000	0.000000	
10	pupeno	0.000000	0.000000	0.337085	0.000000	0.000000	0.125140	
11	pupeno	0.000000	0.000000	0.000000	0.000000	0.000000	0.079078	
12	pupeno	0.000000	0.000000	0.000000	0.105631	0.000000	0.000000	
13	pupeno	0.656317	0.000000	0.000000	0.000000	0.417075	0.085457	
14	pupeno	0.108337	0.000000	0.000000	0.000000	0.000000	0.000000	
15	pupeno	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
16	pupeno	0.371197	0.000000	0.000000	0.000000	0.000000	0.000000	
17	pupeno	0.000000	0.000000	0.352152	0.000000	0.000000	0.000000	
18	pupeno	0.000000	0.000000	0.000000	0.000000	0.000000	0.084689	
19	pupeno	0.000000	0.364640	0.000000	0.000000	0.000000	0.000000	
20	pupeno	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
21	pupeno	0.312392	0.000000	0.000000	0.000000	0.000000	0.122027	
22	pupeno	0.082427	0.366784	0.000000	0.000000	0.000000	0.000000	
23	pupeno	0.000000	0.000000	0.000000	0.000000	0.000000	0.083640	
24	pupeno	0.000000	0.000000	0.000000	0.000000	0.000000	0.026801	
25	pupeno	0.000000	0.000000	0.000000	0.000000	0.143193	0.088019	
26	pupeno	0.000000	0.071220	0.000000	0.000000	0.000000	0.050015	
27	pupeno	0.000000	0.000000	0.000000	0.000000	0.000000	0.081616	
28	pupeno	0.000000	0.531605	0.000000	0.000000	0.000000	0.000000	
29	pupeno	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
30	pupeno	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
31	pupeno	0.000000	0.000000	0.000000	0.000000	0.000000	0.081609	
32	pupeno	0.116987	0.000000	0.000000	0.692403	0.000000	0.000000	
33	pupeno	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
34	pupeno	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
35	pupeno	0.187244	0.000000	0.000000	0.277057	0.000000	0.109712	
	1 1							

36 like application data dump 0.00000 0.000000 0.000000 0.000000 0 1 0.000000 0.000000 0.000000 0.000000 2 0.000000 0.000000 0.000000 0.000000 3 0.000000 0.000000 0.000000 0.000000

4 0.000000 0.000000 0.000000 0.000000 5 0.000000 0.000000 0.000000 0.000000 6 0.000000 0.436139 0.261367 0.000000

7 0.000000 0.000000 0.000000 0.00000 8 0.032758 0.000000 0.040432 0.000000

9 0.000000 0.000000 0.000000 0.000000 10 0.000000 0.356390 0.000000 0.000000

11 0.164020 0.000000 0.000000 0.000000 0.072300 0.000000 0.267708 12 0.617252

13 0.000000 0.000000 0.000000 0.00000 14 0.000000 0.123813 0.000000 0.000000

15 0.000000 0.000000 0.000000 0.000000 16 0.000000 0.000000 0.000000 0.000000

17 0.000000 0.000000 0.000000 0.000000 18 0.263487 0.000000 0.000000 0.000000 0.000000 19 0.000000 0.000000 0.000000

20 0.000000 0.000000 0.095551 0.000000 21 0.126552 0.000000 0.000000 0.000000

22 0.066783 0.000000 0.000000 0.00000 0.000000 23 0.000000 0.000000 0.000000

24 0.055589 0.000000 0.000000 0.000000 25 0.091283 0.000000 0.000000 0.000000

26 0.000000 0.000000 0.000000 0.00000 27 0.000000 0.000000 0.000000 0.000000 28 0.064529 0.177202 0.000000 0.00000

29 0.089201 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 30 0.000000

31 0.000000 0.000000 0.000000 0.000000 32 0.094784 0.000000 0.116987 0.323682 33 0.000000 0.026204 0.000000 0.000000

0.000000 0.000000 0.000000 0.000000 34 0.093622 35 0.000000 0.000000

0.000000 36 0.021477 0.029489 0.000000 0.000000

User ID: Hamza Yerlikaya Top 10 Words TF-IDF ______

displayname java file timer files new Hamza Yerlikaya 0.000000 0.000000 0.084239 0.000000 0.000000 1 Hamza Yerlikaya 0.000000 0.000000 0.000000 0.026395 0.000000 2 Hamza Yerlikaya 0.351468 0.000000 0.312480 0.000000 0.000000

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Hamza Yerlikaya 0.000000 0.000000
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4 Hamza Yerlikaya 0.463315
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  Hamza Yerlikaya 0.000000
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6 Hamza Yerlikaya 0.000000
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7
  Hamza Yerlikaya 0.064939
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  Hamza Yerlikaya 0.000000
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8
                                      0.097851
                                               0.000000
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  Hamza Yerlikaya 0.000000
                            0.000000
                                      0.000000
                                               0.146846
                                                         0.000000
            application
     table
                                    array
                                             bits
                             jar
               0.000000 0.000000 0.00000
0
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                                  0.00000 0.00000
                                  0.00000 0.00000
4
 0.000000
               0.264787 0.264787
5
  0.000000
               0.000000 0.000000
                                  0.00000
                                          0.00000
               0.000000 0.000000
                                  0.00000
6
 0.000000
                                          0.00000
7
  0.000000
               0.000000 0.000000
                                  0.00000
                                          0.00000
8
  0.000000
                                  0.00000
               0.251599 0.251599
                                          0.00000
  0.000000
               0.000000 0.000000 0.49458
                                          0.49458
                                          Top 10 Words TF-IDF
User ID: Joan Venge
  displayname
               python
                          string
                                     like
                                               list
                                                             class \
                                                      gt
0
   Joan Venge 0.145502 0.437078 0.071480 0.000000
                                                     0.0 0.000000
   Joan Venge 0.060947
1
                        0.000000
                                  0.059882
                                           0.366161
                                                     0.0 0.000000
2
   Joan Venge
                                  0.051889
              0.000000 0.000000
                                           0.000000
                                                     0.0 0.000000
   Joan Venge
3
               0.086448 0.649210
                                  0.084937
                                           0.000000
                                                     0.0 0.000000
   Joan Venge
4
               0.194943 0.000000
                                  0.000000
                                                     0.0 0.000000
                                           0.000000
          . . .
                 . . .
. .
                             . . .
                                                . . .
                                                     . . .
61 Joan Venge
               0.101717 0.000000
                                  0.000000
                                           0.000000
                                                     0.0 0.000000
62 Joan Venge
               0.000000 0.000000
                                  0.092332
                                           0.000000
                                                     0.0 0.000000
   Joan Venge
63
               0.000000 0.000000
                                  0.000000
                                           0.000000
                                                     0.0 0.699688
64
   Joan Venge
               0.255396 0.000000
                                  0.125466
                                           0.000000
                                                     0.0 0.000000
65
   Joan Venge
               0.000000 0.000000 0.000000
                                           0.000000 0.0 0.064150
                index
                         value function
       want
0
   0.000000 0.000000 0.000000 0.000000
   1
   0.071552 0.289870
2
                      0.000000 0.000000
3
   0.000000 0.000000
                      0.000000 0.000000
4
   0.000000 0.000000
                      0.000000 0.000000
        . . .
                  . . .
                           . . .
. .
61
   0.000000 0.000000 0.167135
                               0.000000
62
   0.063660 0.000000
                      0.000000 0.000000
63 0.096154
             0.000000
                      0.000000
                                0.000000
```

0.224828

0.000000

0.000000

0.000000

0.192451

64 0.000000

65 0.000000 0.000000

User ID: Ali Top 10 Words TF-IDF

	displayname	e gt	t	array	javascript	php	using	lt	\
0	Ali	_		000000	0.09527	0.000000	0.000000	0.000000	
1	Ali	i 0.00000	0.	000000	0.00000	0.000000	0.000000	0.000000	
2	Alf	i 0.226733	3 0.	000000	0.00000	0.000000	0.169265	0.244775	
3	Ali	i 0.00000	0.	382036	0.14211	0.000000	0.000000	0.000000	
4	Alf	i 0.00000	0.	000000	0.00000	0.083204	0.000000	0.000000	
74	Ali	i 0.000000	0.	602876	0.00000	0.112129	0.000000	0.000000	
75	Ali	i 0.000000	0.	000000	0.00000	0.000000	0.031352	0.000000	
76	Ali	i 0.33271	5 0.	000000	0.00000	0.000000	0.000000	0.359189	
77	Ali	i 0.000000	0.	000000	0.00000	0.000000	0.000000	0.000000	
78	Ali	i 0.00000	0.	000000	0.00000	0.000000	0.070152	0.000000	
	jquery	id	key	file					
0	0.000000	0.000000	0.0	0.0					
1	0.000000	0.000000	0.0	0.0					
2	0.244775	0.000000	0.0	0.0					
3	0.000000	0.000000	0.0	0.0					
4	0.000000	0.000000	0.0	0.0					
74	0.000000	0.000000	0.0	0.0					
75	0.000000	0.317373	0.0	0.0					
76	0.000000	0.000000	0.0	0.0					
77	0.000000	0.167844	0.0	0.0					
78	0.000000	0.000000	0.0	0.0					

[79 rows x 11 columns]

User ID: TIMEX Top 10 Words TF-IDF

	displayname	python	want	user	string	gt	dictionary	\
0	TIMEX	0.285104	0.000000	0.000000	0.000000	0.0	0.00000	
1	TIMEX	0.134952	0.000000	0.000000	0.000000	0.0	0.00000	
2	TIMEX	0.000000	0.000000	0.000000	0.000000	0.0	0.00000	
3	TIMEX	0.000000	0.000000	0.000000	0.177879	0.0	0.00000	
4	TIMEX	0.000000	0.000000	0.000000	0.000000	0.0	0.00000	
110	TIMEX	0.071606	0.000000	0.000000	0.000000	0.0	0.00000	
111	TIMEX	0.053461	0.000000	0.000000	0.000000	0.0	0.07638	
112	TIMEX	0.000000	0.032024	0.000000	0.000000	0.0	0.00000	
113	TIMEX	0.000000	0.000000	0.132608	0.000000	0.0	0.0000	

```
114
         TIMEX 0.000000 0.000000 0.000000 0.000000 0.0
                                                               0.00000
          lt
                        javascript
                   use
                                     return
    0.000000
                          0.000000 0.000000
0
              0.000000
1
    0.000000
              0.000000
                          0.000000
                                    0.000000
2
    0.124939
              0.056344
                          0.000000
                                    0.000000
3
    0.000000 0.000000
                          0.000000
                                    0.000000
4
    0.000000 0.000000
                          0.000000
                                    0.000000
. .
110 0.000000
             0.000000
                          0.099799
                                   0.210055
    0.000000
                          0.000000
111
              0.000000
                                    0.000000
112
    0.000000
              0.000000
                          0.000000
                                    0.000000
    0.063177
                          0.000000
113
              0.000000
                                    0.068069
114
    0.113867
              0.000000
                          0.000000
                                    0.000000
[115 rows x 11 columns]
User ID: Matthew Rankin
                                               Top 10 Words TF-IDF
     displayname install
                                       python
                                                     lt
                                                                     branch
                                pip
                                                               gt
 Matthew Rankin 0.000000 0.000000 0.000000 0.000000 0.043561
                                                                   0.571753
1 Matthew Rankin 0.000000 0.000000 0.000000 0.650278
                                                         0.544984 0.000000
2 Matthew Rankin 0.349045 0.319958 0.319958 0.000000
                                                         0.000000 0.000000
3 Matthew Rankin 0.235219 0.211697
                                     0.094087
                                               0.000000
                                                         0.000000 0.000000
4 Matthew Rankin 0.000000 0.000000
                                      0.000000
                                               0.000000
                                                         0.000000
                                                                   0.000000
 Matthew Rankin 0.427251 0.284834
                                      0.000000
                                               0.000000
                                                         0.000000 0.000000
5
6
  Matthew Rankin
                  0.000000 0.000000
                                      0.000000
                                               0.000000
                                                         0.000000
                                                                   0.000000
7
  Matthew Rankin 0.000000 0.000000 0.338392
                                               0.000000
                                                         0.000000
                                                                   0.000000
   installed
                flask
                        version
                                   django
0
   0.000000 0.000000 0.000000 0.000000
1
   0.000000 0.000000 0.000000 0.000000
2
   0.000000 0.000000 0.000000 0.000000
3
   0.109034 0.000000 0.000000 0.054517
4
   0.447027
             0.533396 0.533396 0.000000
5
   0.000000
            0.000000
                       0.000000
                                 0.000000
6
   0.000000
            0.000000
                       0.000000
                                 0.425746
7
   0.000000 0.000000
                       0.000000
                                0.000000
                                          Top 10 Words TF-IDF
User ID: flybywire
  displayname
                   file
                           python
                                      want
                                                java
                                                            VS
                                                                      gt
0
    flybywire 0.000000 0.000000 0.000000 0.000000
                                                      0.000000 0.000000
1
    flybywire
               0.000000 0.000000
                                   0.112601
                                            0.000000
                                                      0.000000
                                                                0.000000
2
    flybywire
               0.000000 0.000000
                                   0.000000 0.000000
                                                      0.000000
                                                                0.000000
3
    flybywire
               0.000000 0.120377
                                   0.000000 0.000000
                                                      0.000000
                                                                0.000000
```

```
4
     flybywire
                0.399837
                           0.000000
                                      0.000000
                                                0.000000
                                                           0.000000
                                                                      0.300322
5
     flybywire
                0.166264
                                                           0.000000
                           0.000000
                                      0.155217
                                                0.000000
                                                                      0.000000
6
     flybywire
                0.000000
                           0.000000
                                      0.000000
                                                0.657184
                                                           0.000000
                                                                      0.000000
7
     flybywire
                0.099270
                                      0.000000
                                                0.000000
                                                           0.000000
                           0.111844
                                                                      0.000000
                                                           0.00000
     flybywire
8
                0.000000
                           0.461401
                                      0.000000
                                                0.000000
                                                                      0.000000
9
     flybywire
                0.000000
                           0.000000
                                      0.123087
                                                0.000000
                                                           0.000000
                                                                      0.000000
10
     flybywire
                0.000000
                           0.000000
                                      0.000000
                                                0.000000
                                                           0.000000
                                                                      0.000000
11
     flybywire
                0.227342
                           0.000000
                                      0.106118
                                                0.000000
                                                           0.000000
                                                                      0.000000
12
     flybywire
                0.000000
                                      0.000000
                                                0.000000
                                                           0.153493
                           0.146583
                                                                      0.000000
13
     flybywire
                0.076246
                           0.000000
                                      0.284718
                                                0.000000
                                                           0.000000
                                                                      0.000000
14
                0.000000
                                      0.00000
     flybywire
                           0.112790
                                                0.000000
                                                           0.000000
                                                                      0.225579
15
     flybywire
                0.000000
                                      0.000000
                                                0.000000
                                                           0.000000
                           0.000000
                                                                      0.000000
16
                                      0.00000
                                                           0.229172
     flybywire
                0.000000
                           0.000000
                                                0.544821
                                                                      0.000000
17
     flybywire
                0.000000
                           0.000000
                                      0.000000
                                                0.000000
                                                           0.000000
                                                                      0.000000
18
     flybywire
                0.000000
                           0.000000
                                      0.000000
                                                0.000000
                                                           0.000000
                                                                      0.000000
19
     flybywire
                0.000000
                           0.000000
                                      0.000000
                                                0.000000
                                                           0.000000
                                                                      0.00000
20
     flybywire
                0.000000
                           0.000000
                                      0.00000
                                                0.000000
                                                           0.000000
                                                                      0.000000
21
     flybywire
                0.000000
                           0.000000
                                      0.086403
                                                0.000000
                                                           0.000000
                                                                      0.052138
22
     flybywire
                0.000000
                           0.000000
                                      0.000000
                                                0.000000
                                                           0.228055
                                                                      0.000000
23
                                      0.066645
                                                0.00000
     flybywire
                0.071389
                           0.000000
                                                           0.000000
                                                                      0.000000
                0.000000
24
     flybywire
                           0.000000
                                      0.000000
                                                0.000000
                                                           0.000000
                                                                      0.000000
25
     flybywire
                0.000000
                           0.000000
                                      0.116217
                                                0.000000
                                                           0.000000
                                                                      0.280514
26
     flybywire
                0.000000
                           0.000000
                                      0.000000
                                                0.000000
                                                           0.000000
                                                                      0.000000
27
     flybywire
                0.000000
                           0.000000
                                      0.00000
                                                0.000000
                                                           0.000000
                                                                      0.000000
28
     flybywire
                0.315679
                           0.000000
                                      0.098234
                                                0.000000
                                                           0.000000
                                                                      0.000000
29
     flybywire
                                      0.00000
                                                           0.000000
                0.000000
                           0.000000
                                                0.000000
                                                                      0.000000
                                                0.000000
30
     flybywire
                0.000000
                           0.000000
                                      0.000000
                                                           0.000000
                                                                      0.000000
31
     flybywire
                                      0.00000
                0.000000
                           0.316739
                                                0.000000
                                                           0.000000
                                                                      0.000000
32
     flybywire
                0.000000
                                      0.000000
                                                0.000000
                                                           0.000000
                           0.000000
                                                                      0.000000
33
     flybywire
                0.000000
                           0.000000
                                      0.000000
                                                0.000000
                                                           0.000000
                                                                      0.00000
34
     flybywire
                0.000000
                           0.000000
                                      0.000000
                                                0.000000
                                                           0.000000
                                                                      0.000000
     flybywire
35
                0.000000
                           0.000000
                                      0.068348
                                                0.000000
                                                           0.000000
                                                                      0.082486
36
     flybywire
                0.000000
                           0.000000
                                      0.000000
                                                0.000000
                                                           0.000000
                                                                      0.000000
37
     flybywire
                0.175813
                           0.000000
                                      0.082066
                                                0.000000
                                                           0.000000
                                                                      0.198083
38
     flybywire
                0.000000
                                      0.000000
                                                           0.000000
                           0.000000
                                                0.000000
                                                                      0.000000
39
     flybywire
                0.000000
                           0.000000
                                      0.000000
                                                0.138204
                                                           0.000000
                                                                      0.111033
40
     flybywire
                                                           0.000000
                0.237010
                           0.000000
                                      0.000000
                                                0.000000
                                                                      0.000000
41
     flybywire
                0.000000
                           0.000000
                                      0.000000
                                                0.000000
                                                           0.194207
                                                                      0.000000
42
     flybywire
                0.000000
                                      0.00000
                                                0.000000
                                                           0.00000
                           0.000000
                                                                      0.000000
43
     flybywire
                0.000000
                           0.000000
                                      0.000000
                                                0.000000
                                                           0.000000
                                                                      0.000000
44
     flybywire
                0.297907
                           0.00000
                                      0.139056
                                                0.000000
                                                           0.00000
                                                                      0.00000
45
     flybywire
                0.000000
                                      0.000000
                                                0.000000
                                                           0.000000
                           0.000000
                                                                      0.000000
46
     flybywire
                0.000000
                           0.321788
                                      0.000000
                                                0.000000
                                                           0.000000
                                                                      0.000000
47
     flybywire
                0.000000
                                      0.000000
                                                0.000000
                                                           0.220426
                           0.000000
                                                                      0.000000
48
                                      0.00000
     flybywire
                0.000000
                           0.000000
                                                0.000000
                                                           0.255143
                                                                      0.000000
```

use bash instance standard 0 0.000000 0.000000 0.000000 0.000000

```
0.000000
              0.000000
                         0.000000
                                    0.000000
1
2
    0.000000
              0.000000
                         0.000000
                                    0.00000
3
    0.000000
              0.000000
                         0.000000
                                    0.00000
4
    0.157240
              0.165412
                         0.000000
                                    0.498416
5
    0.000000
              0.412698
                         0.000000
                                    0.466327
6
              0.000000
    0.000000
                         0.000000
                                    0.00000
7
    0.000000
              0.000000
                         0.000000
                                    0.00000
8
    0.000000
              0.000000
                         0.000000
                                    0.00000
9
    0.000000
              0.000000
                         0.000000
                                    0.00000
10
    0.000000
              0.000000
                         0.000000
                                    0.00000
    0.000000
              0.000000
                         0.000000
                                    0.00000
11
12
    0.306986
              0.000000
                         0.000000
                                    0.000000
    0.000000
              0.000000
                         0.000000
13
                                    0.000000
14
    0.000000
              0.000000
                         0.000000
                                    0.000000
15
    0.000000
              0.000000
                         0.000000
                                    0.00000
    0.114586
              0.000000
                         0.000000
16
                                    0.000000
17
    0.000000
              0.000000
                         0.000000
                                    0.00000
    0.000000
              0.000000
                         0.000000
18
                                    0.000000
    0.000000
              0.000000
                         0.864911
                                    0.00000
19
20
    0.000000
              0.000000
                         0.000000
                                    0.000000
21
    0.054596
              0.172300
                         0.000000
                                    0.00000
22
    0.000000
              0.000000
                         0.000000
                                    0.00000
23
    0.000000
              0.177199
                         0.000000
                                    0.00000
              0.000000
24
    0.000000
                         0.000000
                                    0.00000
25
    0.000000
              0.000000
                         0.000000
                                    0.00000
26
    0.000000
              0.000000
                         0.000000
                                    0.00000
27
    0.000000
                         0.000000
              0.000000
                                    0.000000
28
    0.000000
              0.261191
                         0.000000
                                    0.000000
29
    0.000000
              0.000000
                         0.000000
                                    0.000000
30
    0.000000
              0.000000
                         0.000000
                                    0.00000
    0.000000
              0.000000
                         0.000000
31
                                    0.000000
32
    0.000000
              0.000000
                         0.000000
                                    0.00000
                                    0.00000
33
    0.000000
              0.000000
                         0.000000
    0.000000
              0.000000
                         0.000000
                                    0.000000
34
35
    0.000000
              0.000000
                         0.000000
                                    0.00000
36
    0.000000
              0.000000
                         0.000000
                                    0.00000
37
    0.000000
              0.000000
                         0.000000
                                    0.000000
    0.000000
              0.000000
                         0.000000
                                    0.000000
38
39
    0.000000
              0.000000
                         0.000000
                                    0.000000
40
    0.000000
              0.000000
                         0.000000
                                    0.000000
    0.388413
              0.000000
                         0.000000
41
                                    0.000000
    0.000000
              0.000000
                         0.000000
42
                                    0.207214
43
    0.000000
              0.000000
                         0.000000
                                    0.000000
44
    0.175732
              0.000000
                         0.000000
                                    0.000000
45
    0.000000
              0.000000
                         0.317777
                                    0.00000
46
    0.000000
              0.000000
                         0.000000
                                    0.000000
47
    0.000000
              0.000000
                         0.000000
                                    0.00000
48
    0.000000
              0.000000
                         0.000000
                                    0.00000
```

[]:[