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**pylookml**

*Release 3.0.0*

**Jan 26, 2021**



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```
view + f'''dimension: {{dim}} {  
    type: number  
    sql: {{dim_sql}} ;;  
}'''
```

PyLookML allows scripting of LookML in python. It leverages the [lkml](#) parser to interpret raw lookml files then adds an object oriented syntax and helpful integrations to boost your productivity. [View the source code](#) or [log an issue here](#).

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**Note:** pyLookML 3.0.0, a milestone release, is now available on [pip](#). See the [changelog](#) for details.

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# CHAPTER 1

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## Why

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**Sometimes usecases demand automation, where you want rules to govern the rules.**

- EAV data / frequently changing custom fields (see [EAV](#))
- Nested data
- Applying complex patterns repeatably
- Create LookML based on API response (such as [autotune](#))
- Bulk conversion of old reports





Install pylookml package via pip

```
pip install lookml
```

Make a github access token

Fetch a viewFile from Github and print one of its dimensions

```
1 import lookml
2 proj = lookml.Project(
3     repo= "llooker/pyLookMLExample",
4     access_token="your_github_access_token",
5     #Optional args for the deploy URL (for deploying directly to production mode)
6     ,looker_host="https://mylooker.looker.com/"
7     ,looker_project_name="my_project "
8 )
9 viewFile = proj.file('01_order_items.view.lkml')
10 orderItems = viewFile.views.order_items
11 print(orderItems.id)
```

Or do the same thing from any other git service (as long as you have SSH git access on the machine pyLookML is running on):

```
1     self.proj = lookml.Project(
2         git_url='git@bitbucket.org:myorg/russ_sandbox.git'
3         #Optional args for the deploy URL (for deploying directly to production_
4         ↪mode)
5         ,looker_host="https://mylooker.looker.com/"
6         ,looker_project_name="my_project "
7     )
```

This works for bitbucket, gitlab, or private git servers.

**How to reference objects** The taxonomy is basically as follows project>file>'views'>viewname>fieldname>property  
project>file>'explores'>explorename>joinname>property

```
myProject = lookml.Project(
    repo= "llooker/russ_sandbox",
    access_token="your_github_access_token",
)
#Use a dot operator syntax:
myProject.file('order_items.view.lkml').views.order_items.id.primary_key.value

#Use a dictionary like syntax:
myProject['order_items.view.lkml']['views']['order_items']['id'].primary_key.value
```

Get all the way down to property values in one line of code

```
lookml.Project(**config['project1'])['order_items.view.lkml']['views']['order_items']['id'].primary_key.value
```

### Looping over stuff

```
dimension: id {
    type: string
    sql: ${TABLE}.id ;;
    tags: ["a", "b", "c"]
}
```

```
for tag in order_items.id.tags:
    print(tag)
>>> 'a'
>>> 'b'
>>> 'c'
```

### Updating things

The + operator in pyLookML is significant, it allows us to add a string of LookML to our object like so. Also notice the way we change the primary key paramter.

```
1 order_items = lookml.View('order_items')
2 order_items + '''
3     dimension: id {
4         type: string
5         sql: ${TABLE}.id ;;
6     }
7 '''
8 order_items.id.primary_key = 'yes'
9 print(order_items)
```

after your object is updated, you need to save it back to github, and optionally hit the looker deploy URL

```
1 newFile = lookml.File(order_items)
2 #the put method, creates or overwrites
3 myProject.put(newFile)
4 #optionally hitting the Looker deploy URL (requires that you set your instance URL_
5 ↳on project creation)
6 myProject.deploy()
```

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## Build from a developer version

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*Step 1) Create a virtual env from a clean python and install the dependencies*

```
which python3 #(this is generally the best interpreter use as the startingpoint)
#Output: /Library/Frameworks/Python.framework/Versions/3.8/bin/python3
mkdir lookml_test
cd lookml_test
virtualenv -p /Library/Frameworks/Python.framework/Versions/3.8/bin/python3 lookml_
↳test_env
source lookml_test_env/bin/activate
pip install pygithub
pip install lkml
```

*Step 2) go to github and look for the specific commit you'd like to build and replace it in the following command after the @ sign*

```
pip install git+https://github.com/llooker/lookml.
↳git@04dbd05dd3f37a7fa624501a370df52af26bb5fc
```

## 3.1 Cookbook / Examples

### 3.1.1 Basic Recipes

- connect to your github project

```
1 import lookml
2 proj = lookml.Project(
3     repo= "llooker/russ_sandbox",
4     access_token="your_github_access_token",
5 )
```

**Note:** Project() will dispatch the correct project subclass ProjectGithub or ProjectSSH depending on the args provided

---

Or do the same thing from any other git service (as long as you have SSH git access on the machine pyLookML is running on):

```
1     proj = lookml.ProjectSSH(  
2         git_url='git@bitbucket.org:myorg/russ_sandbox.git'  
3         #Optional args for the deploy URL (for deploying directly to prodcutio_  
↔mode)  
4         ,looker_host="https://mylooker.looker.com/"  
5         ,looker_project_name="my_project"  
6     )
```

Or just connect to the local filesystem without git:

```
1     proj = lookml.Project(  
2         path='path/to/myproject'  
3     )
```

- Loop over the views in a file

```
1 myFile = proj.file('01_order_items.view.lkml')  
2 #Loops over 1:n views in the file  
3 for view in myFile.views:  
4     print(view)
```

- create a new file in your project

```
1 newFile = proj.new_file('views/my_new_file.view.lkml')  
2 newFile + 'view: new_view {}'  
3 newFile.views.new_view + lookml.Dimension('dimension: id {}')
```

- create a new model file

```
1 modelFile = proj.new_file('my_new_model.model.lkml')  
2 modelFile + 'explore: foo {}'
```

- Write your files back to github

```
1 viewFile = proj.file('01_order_items.view.lkml')  
2 viewFile.views.order_items.id.addTag("hello, World!")  
3 proj.put(viewFile)
```

- Loop over fields of a certain type

```
1 >>> for dim in myFile.views.order_items.dimensions():  
2     ...     print(dim.__ref__)  
3     ...  
4     ${order_items.new_dimension}  
5     ${order_items.id}  
6     ${order_items.cpt_code_value}  
7     ${order_items.inventory_item_id}  
8     ...  
9 >>> for meas in myFile.views.order_items.measures():  
10    ...     print(meas.__ref__)  
11    ...
```

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```

12  ${order_items.count}
13  ${order_items.min_sale_price}
14  ${order_items.max_sale_price}
15  ${order_items.order_count}
16  >>> for flt in myFile.views.order_items.filters():
17  ...     print(flt.__ref__)
18  ...
19  ${order_items.cpt_code}
20  ${order_items.cohort_by}
21  ${order_items.metric}

```

- check all of the children / descendants of a field

```

1  >>> for child in order_items.sale_price.children():
2  ...     print(child.__refs__)
3  ...
4  ${min_sale_price}
5  ${max_sale_price}
6  ${total_sale_price}
7  ${average_sale_price}
8  ${median_sale_price}
9  ${returned_total_sale_price}
10  ${gross_margin}
11  ${item_gross_margin_percentage}

```

- search a view for dimensions who's properties match a regex pattern (Find view fields by regex searching any parameter)

```

1  >>> for item in order_items.search('sql', '\${shipped_raw}'):
2  ...     print(item.__ref__)
3  ...     print(item.sql)
4  ...
5  ${order_items.shipping_time}
6  sql: datediff('day', ${shipped_raw}, ${delivered_raw})*1.0 ;;

```

- Add a new view to an existing file

```

1  myNewView = lookml.View('hello_world')
2  myFile = proj.file('01_order_items.view.lkml')
3  myFile + myNewView
4  for view in myFile.views:
5  ...     print(view.name)
6  >>> 'order_items'
7  >>> 'hello_world'

```

- Get fields by tag, do work, remove tag

```

1  for field in orderItems.getFieldsByTag('x'):
2  ...     #do work
3  ...     field.removeTag('x')

```

## 3.1.2 Field References

```

1 >>> myView = View('order_items') + 'id'
2 >>> print(myView.id)
3 dimension: id {
4
5     }
6 #__ref__ stands for reference
7 >>> print(myView.id.__ref__)
8 ${order_items.id}
9 #__refs__ stands for reference short
10 >>> print(myView.id.__refs__)
11 ${id}
12 #__refr__ stands for reference raw
13 >>> print(myView.id.__refr__)
14 order_items.id
15 #__refrs__ stands for reference raw short
16 >>> print(myView.id.__refrs__)
17 id

```

### 3.1.3 Convenience Methods

- Add a sum measure for every number dimension on a view

```

1 orderItems.sumAllNumDimensions()

```

- Change the name of a field and all its child references

```

1 >>> print(order_items2.shipping_time)
2
3 dimension: shipping_time {
4     type: number
5     sql: datediff('day',${shipped_raw},${delivered_raw})*1.0 ;;
6 }
7
8 >>> for field in order_items2.shipping_time.children():
9     ... print(field)
10
11 measure: average_shipping_time {
12     type: average
13     value_format_name: decimal_2
14     sql: ${shipping_time} ;;
15 }
16 #The setName_safe method previously change_name_and_child_references, use that if_
17 ↪setName_safe not found
18 >>> order_items2.shipping_time.setName_safe('time_in_transit')
19 >>> print(time_in_transit)
20 dimension: time_in_transit {
21     type: number
22     sql: datediff('day',${shipped_raw},${delivered_raw})*1.0 ;;
23 }
24 >>> for field in order_items2.time_in_transit.children():
25     ... print(field)
26 measure: average_shipping_time {
27     type: average
28     value_format_name: decimal_2
29     sql: ${time_in_transit} ;;
30 }

```

- working with a local file
- Changing field names safely (The setName\_safe method previously change\_name\_and\_child\_references, use that if setName\_safe not found)

```
myFile = lookml.File('example.view.lkml')
for v in myFile.views:
    for f in v.measures():
        if f.type.value == 'sum' and not f.name.endswith('_total'):
            f.name = f.setName_safe(f.name + '_total')
#Optionally Change the location
myFile.setFolder('path/to/other/folder')
#Write the file
x.write()
```

## 3.2 AutoGen for EAV

**Warning:** Setting up EAV automation can generate high code volume. Pair with a Looker architect to plan for scale. Multiple instances may be necessary at large volumes.

### 3.2.1 What is EAV?

EAV data is storing key / value pairs in a table. It can allow application owners to hold data for which they can't predict the columns or attributes at design time. Common examples might include customizable objects (i.e. my users can add their own fields), or scientific data with many attributes or surveys. EAV data allows flexibility, but can be notoriously difficult to perform analysis on. In this tutorial, we will show how pyLookML can be configured to create LookML for unpacking, imposing a permission structure and allowing analysis on EAV data.

*An Example of a configurable user profile table*

Our example will follow a site with a configurable user profile. Organizations that use the site “Orgs” can add profile fields for their members so that admins can track org specific values for each of their user accounts.

Here is the sample data we'll be using throughout. Imagine this sample data comes from a table called custom\_profile\_fields.

Table 1: custom\_profile\_fields

user_id	org_id	field_name	value	datatype
1	8	c_donation_amount	40	int
1	8	c_highest_achievement	gold badge	varchar
2	101	c_highest_achievement	silver badge	varchar
2	101	c_monthly_contribution	300	int
3	101	c_highest_achievement	bronze badge	varchar
3	101	c_monthly_contribution	350	int
4	101	c_monthly_contribution	350	int
4	101	age	32	int
5	102	c_monthly_contribution	100	int

You can see that the field name and value form the key,value relationship characteristic of EAV. Structured in a traditional table layout, we would need 4 columns to capture the 4 distinct custom fields: c\_donation\_amount, c\_highest\_achievement, c\_monthly\_contribution, age. And this would grow (as orgs and user accounts were added) to be much wider than is practical, or wider than the database may even allow a table to be. However for analysis,

we want to create a “slice” of this table for each org, showing them just their attributes as if it were a normal table. Also notice that because the “value” column has mixed datatypes it must be a wide and neutral (typically a very wide varchar) and cast by the application when the record is read. Often by necessity you will often see the value paired with a column which tracks its type so the application can bind it to the right datatype at runtime.

Here is the LookML starting point (the script assumes that you have already created views for the relevant tables) but it will allow the ongoing programatic addition of fields. We have a `usr` table which tracks basic information about our user accounts `eav_source` (which would be pointed at `public.custom_profile_fields`) and `usr_profile` which will track the extended profile attributes from `custom_profile_fields` (we’ll also permission the fields at the org level). The `explore usr`, just associates our `usr` table to the `usr_profile` table which will contain the un-packed EAV values. We have also added an access filter, so that our orgs can only see thier own records.

```
connection: "snowlooker"

explore: usr {
  access_filter: {
    field: usr_profile.org_id
    user_attribute: org_id
  }
  join: usr_profile {
    type: left_outer
    relationship: one_to_one
    sql_on: ${usr.id} = ${usr_profile.user_id} ;;
  }
}

view: usr {
  sql_table_name: public.users ;;
  dimension: email {}
  dimension: id {}
  dimension_group: created { timeframes: [raw,date,month,year] }
}

view: usr_profile {
  dimension: org_id {}
  dimension: user_id {}
}

view: eav_source {
  sql_table_name: public.custom_profile_fields ;;
  dimension: datatype { type: string }
  dimension: field_name { type: string }
  dimension: org_id { type: number }
  dimension: user_id { type: number }
  dimension: value { type: string }
}
```

Now for the automation code. First install the dependencies (FYI I highly reccoemnd using a virtual environment). We will be using the [Looker SDK](#) to run sql against the DB which will tell us what fields we need to create. And we’ll install our `pyLookML` package as well.

```
pip install lookml, looker_sdk
```

create a file called `api.ini` in the directory where your python script will run to house the Looker API connection parameters:

```
# Base URL for API. Do not include /api/* in the url
```

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```

base_url = https://mylooker.looker.com:19999
# API 3 client id
client_id=put_your_client_id_here
# API 3 client secret
client_secret=put_your_secret_here
# Set to false if testing locally against self-signed certs. Otherwise leave True

```

The automation python file follows these high level steps.

1. connect to the Looker API to pull a list of EAV fields
2. create a pyLookML project connection to your github
3. Set up the objects we'll be manipulating (some are just strings which will be added back to the LookML at the end)
4. loop over the list of EAV k,v pairs and do work
5. loop over the distinct raw columns (obtained in the full k,v loop) for adding columns to the NDT
6. loop over the distinct org ids to add the model's access grants
7. add all the final objects back to the model file
8. save the file back to the project in github
9. hit the looker deploy URL to sync Looker production mode with the github master branch

```

1  import lookml
2  from looker_sdk import models, methods, init40
3  import json
4
5  # step 1 -- connect to the Looker API to pull a list of EAV fields
6  sdk = init40("api.ini")
7  sql_for_fields = f"""
8      SELECT
9          cpf.org_id
10         ,cpf.value
11         ,cpf.datatype
12         ,cpf.field_name as FIELD_NAME
13         , CASE
14             WHEN cpf.datatype IN ('TIMESTAMP_LTZ') THEN 'time'
15             WHEN cpf.datatype IN ('FLOAT','NUMBER','int') THEN 'number'
16             ELSE 'string' END as LOOKER_TYPE
17     FROM
18         -- public.custom_profile_fields as cpf
19         (
20             SELECT 1 as user_id, 8 as org_id, 'c_donation_amount' as field_name,
↳ '40' as value, 'int' as datatype UNION ALL
21             SELECT 1, 8, 'c_highest_achievement', 'gold badge', 'varchar' UNION_
↳ ALL
22             SELECT 2, 101, 'c_highest_achievement', 'silver badge', 'varchar'
↳ UNION ALL
23             SELECT 2, 101, 'c_monthly_contribution', '300', 'int' UNION ALL
24             SELECT 3, 101, 'c_highest_achievement', 'bronze badge', 'varchar'
↳ UNION ALL
25             SELECT 3, 101, 'c_monthly_contribution', '350', 'int' UNION ALL
26             SELECT 4, 101, 'c_monthly_contribution', '350', 'int' UNION ALL
27             SELECT 4, 101, 'age', '32', 'int' UNION ALL
28             SELECT 5, 102, 'c_monthly_contribution', '100', 'int'

```

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```

29         ) as cpf
30     WHERE
31         l=1
32     GROUP BY 1,2,3,4,5
33     """
34     query_config = models.SqlQueryCreate(sql=sql_for_fields, connection_id="snowlooker")
35     query = sdk.create_sql_query(query_config)
36     response = json.loads(sdk.run_sql_query(slug=query.slug, result_format="json"))
37
38     # step 2 -- create a pyLookML project connection to your github
39     proj = lookml.Project(
40         #the github location of the repo
41         repo= 'llooker/your_repo'
42         #instructions on creating an access token: https://help.github.com/en/github/
↳authenticating-to-github/creating-a-personal-access-token-for-the-command-line
43         ,access_token='your_access_token'
44         #your Looker host
45         ,looker_host="https://example.looker.com/"
46         #The name of the project on your looker host
47         ,looker_project_name="pylookml_testing_2"
48         #You can deploy to branches other than master, a shared or personal branch,
↳if you would like to hop into looker, pull
49         #remote changes and review before the code is committed to production
50         ,branch='master'
51     )
52     #For simplicity of this example, all of the objects we're tracking will be contained
↳in the model file, but for your needs can be split across the project.
53     modelFile = proj['eav_model.model.lkml']
54
55     # step 3 -- Set up the objects we'll be manipulating (some are just strings which
↳will be added back to the LookML at the end)
56     #the EAV source view points to our custom_profile_fields database table
57     eavSource = modelFile['views']['eav_source']
58     #the user profile we'll call the "flattening NDT" since that's where our flattening
↳logic lives
59     flatteningNDT = modelFile['views']['usr_profile']
60
61
62     #Ensure there is a hidden explore to expose the eav_souce transformations to our
↳user_profile NDT
63     modelFile + f'''
64         explore: _eav_flattener {{
65             from: {eavSource.name}
66             hidden: yes
67         }}
68     '''
69     #Begin the derived table, will be added to as we loop through the fields
70     drivedtableString = f'''
71         derived_table: {{
72             explore_source: _eav_flattener {{
73                 column: user_id {{ field: _eav_flattener.user_id }}
74                 column: org_id {{ field: _eav_flattener.org_id }}
75             }}
76
77     #Set up a pair of list to track the unique org ids and column names
78     #since the api query will be at a org / column level this allows us to "de-dupe"
79     orgIds, columns = [], []

```

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```

80
81 # step 4 -- loop over the list of EAV k,v pairs and do work
82 for column in response:
83     dimName = lookml.core.lookCase(column['FIELD_NAME'])
84     orgIds.append(column['org_id'])
85     columns.append(dimName)
86     #Step 1) Add flattening measure to the EAV source table
87     eavSource + f'''
88         measure: {dimName} {{
89             type: max
90             sql: CASE WHEN ${field_name} = '{column['FIELD_NAME']}' THEN ${
↪{value}} ELSE NULL END;;
91         }}
92     '''
93
94     # Add to the NDT fields
95     flatteningNDT + f'''
96         dimension: {dimName}_org_{column['org_id']} {{
97             label: "{dimName}"
98             type: {column['LOOKER_TYPE']}
99             sql: ${TABLE}.${dimName} ;;
100            required_access_grants: [org_{column['org_id']}]
101        }}
102    '''
103    if column['LOOKER_TYPE'] == "number":
104        flatteningNDT + f'''
105            measure: {dimName}_total_org_{column['org_id']} {{
106                label: "{dimName}_total"
107                type: sum
108                sql: ${dimName}_org_{column['org_id']} ;;
109                required_access_grants: [org_{column['org_id']}]
110            }}
111        '''
112    # step 5 -- loop over the distinct raw columns (obtained in the full k,v loop) for_
↪adding columns to the NDT
113    for col in set(columns):
114        drivetableString += f' column: {col} {{ field: _eav_flattener.{col} }}'
115        drivetableString += '}'
116
117    # step 6 -- loop over the distinct org ids to add the model's access grants
118    accessGrants = ''
119    for org in set(orgIds):
120        accessGrants += f'''
121            access_grant: org_{org} {{
122                user_attribute: org_id
123                allowed_values: [
124                    "{org}"
125                ]
126            }}
127        '''
128    # step 7 -- add all the final objects back to the model file
129    #Finish by adding some of the strings we've been tracking:
130    flatteningNDT + drivetableString
131    #Add access grants to the model
132    modelFile + accessGrants
133
134    # step 8 -- save the file back to the project in github

```

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```
135 proj.put(modelFile)
136 #s step 9 -- hit the looker deploy URL to sync Looker production mode with the_
    ↪github master branch
137 proj.deploy()
```

### The Completed LookML output to the eav.model.lkml file

```
connection: "snowlooker"

access_grant: org_8 {
  user_attribute: org_id
  allowed_values: [
    "8",
  ]
}
access_grant: org_101 {
  user_attribute: org_id
  allowed_values: [
    "101",
  ]
}
access_grant: org_102 {
  user_attribute: org_id
  allowed_values: [
    "102",
  ]
}

explore: usr {
  access_filter: {
    field: usr_profile.org_id
    user_attribute: org_id
  }
  join: usr_profile {
    type: left_outer
    relationship: one_to_one
    sql_on: ${usr.id} = ${usr_profile.user_id} ;;
  }
}

explore: _eav_flattener {
  from: eav_source
  hidden: yes
}

view: usr {
  sql_table_name: public.users ;;
  dimension: email {}
  dimension: id {}
  dimension_group: created {
    timeframes: [
      raw, date, month, year,
    ]
    type: time
  }
}
```

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```

view: usr_profile {

derived_table: {
  explore_source: _eav_flattener {
    column: user_id { field: _eav_flattener.user_id}
    column: org_id { field: _eav_flattener.org_id }
    column: c_donation_amount { field: _eav_flattener.c_donation_amount}
    column: c_monthly_contribution { field: _eav_flattener.c_monthly_contribution }
    column: c_highest_achievement { field: _eav_flattener.c_highest_achievement }
    column: age { field: _eav_flattener.age }
  }
}

dimension: age_org_101 {
  label: "age"
  type: number
  sql: ${TABLE}.age ;;
  required_access_grants: [org_101,]
}

dimension: c_donation_amount_org_8 {
  label: "c_donation_amount"
  type: number
  sql: ${TABLE}.c_donation_amount ;;
  required_access_grants: [org_8,]
}

dimension: c_highest_achievement_org_101 {
  label: "c_highest_achievement"
  type: string
  sql: ${TABLE}.c_highest_achievement ;;
  required_access_grants: [org_101,]
}

dimension: c_highest_achievement_org_8 {
  label: "c_highest_achievement"
  type: string
  sql: ${TABLE}.c_highest_achievement ;;
  required_access_grants: [org_8,]
}

dimension: c_monthly_contribution_org_101 {
  label: "c_monthly_contribution"
  type: number
  sql: ${TABLE}.c_monthly_contribution ;;
  required_access_grants: [org_101,]
}

dimension: c_monthly_contribution_org_102 {
  label: "c_monthly_contribution"
  type: number
  sql: ${TABLE}.c_monthly_contribution ;;
  required_access_grants: [org_102,]
}

dimension: org_id {}
dimension: user_id {}
measure: age_total_org_101 {
  label: "age_total"
  type: sum
  sql: ${age_org_101} ;;
  required_access_grants: [org_101,]
}

measure: c_donation_amount_total_org_8 {

```

(continues on next page)

```

    label: "c_donation_amount_total"
    type: sum
    sql: ${c_donation_amount_org_8} ;;
    required_access_grants: [org_8,]
  }
measure: c_monthly_contribution_total_org_101 {
  label: "c_monthly_contribution_total"
  type: sum
  sql: ${c_monthly_contribution_org_101} ;;
  required_access_grants: [org_101,]
}
measure: c_monthly_contribution_total_org_102 {
  label: "c_monthly_contribution_total"
  type: sum
  sql: ${c_monthly_contribution_org_102} ;;
  required_access_grants: [org_102,]
}
}

view: eav_source {
  sql_table_name: public.custom_profile_fields ;;
  dimension: datatype { type: string }
  dimension: field_name { type: string }
  dimension: org_id { type: number }
  dimension: user_id { type: number }
  dimension: value { type: string }

measure: age {
  type: max
  sql: CASE WHEN ${field_name} = 'age' THEN ${value} ELSE NULL END ;;
}
measure: c_donation_amount {
  type: max
  sql: CASE WHEN ${field_name} = 'c_donation_amount' THEN ${value} ELSE NULL END ;;
}
measure: c_highest_achievement {
  type: max
  sql: CASE WHEN ${field_name} = 'c_highest_achievement' THEN ${value} ELSE NULL
↪END ;;
}
measure: c_monthly_contribution {
  type: max
  sql: CASE WHEN ${field_name} = 'c_monthly_contribution' THEN ${value} ELSE NULL
↪END ;;
}
}

```

## More information and resources

1. [2019 Looker JOIN presentation on EAV and LookML Generation](#)
2. [More about modeling EAV data in Looker](#)

As an alternative to the `MAX(CASE WHEN NAME='foo' THEN VALUE END)` construct, you can use first / last value window functions. The specifics of the implementation may look slightly different.

```

FIRST_VALUE (
  CASE
    WHEN attributename = 'single_type' THEN attributevalue
    ELSE NULL
  END
  IGNORE NULLS)
OVER (partition by sessionid order by sessionid)

```

### 3.3 Autotune your model using PyLookML

PyLookML offers a command line interface (CLI) which offers several commands, one of which is autotune. It will automatically create aggregate awareness tables inside of your LookML model based on the most frequently run queries and commit to a developer branch so that you can confirm the output first.

Let's get started with an example: Ensure that you have installed it using pip, which will bind the lookml command. **Note:** if you install it in a virtual environment the lookml command will only be available when the virtual environment is active.

```
pip install lookml
```

We will be using a cli command 'lookml autotune' which will search for a file in your current directory called autotune.ini.

- pyLookML look for an autotune.ini file in the current working directory
- Your autotune.ini should look like this:

```

[autotune]
access_token = xxx
looker_host = https://mycompany.looker.com:19999
api_client = xxx
api_secret = yyy
model_name = bike_share
branch = dev-john-doe-yddt

```

Then on the command line you can run:

```
lookml autotune
```

If your autotune.ini is stored in a different location, you can provide the path by running

```
lookml autotune useconfig
```

and you will be prompted to provide the path

If you would like to provide each bit of info interactively run:

```
lookml autotune guided
```

it will ask you for all the info and you can paste it in.

It may take a minute to run, but the result will be a single file with your aggregates located on the branch you provided, allowing you to check the output before pushing to production.

File Browser ≡ ☑ 🔍 +

▼ pylookml

📄 bike\_share\_aggs.view

bike\_share\_aggs.view ▼

```

i 1 |include: "**/*.model"
2
3
i 4 | explore: +station_forecasting {
5 |   aggregate_table: auto_pylookml_5PKjKfR {
i 6 |     query: {
7 |       dimensions: [trip_start_count_prediction.station_id, station.location]
8 |       measures: [trip_start_count_prediction.predicted_daily_surplus]
i 9 |       description: "https://dat.dev.looker.com/x/5PKjKfR"
10 |       filters: [ trip_start_count_prediction.predicted_daily_surplus: ">=2.25,<-2.6" ]
11 |     }
12 |     materialization: {
13 |       datagroup_trigger: sweet_datagroup
14 |     }
15 |   aggregate_table: auto_pylookml_dqXhqrB {
i 16 |     query: {
17 |       dimensions: [station.name]
18 |       measures: [trip_start_count_prediction.predicted_daily_surplus]
i 19 |       description: "https://dat.dev.looker.com/x/dqXhqrB"
20 |       filters: [ trip_start_count_prediction.predicted_daily_surplus: ">=2.25,<-2.6" ]
21 |     }
22 |     materialization: {
23 |       datagroup_trigger: sweet_datagroup
24 |     }
25 |   aggregate_table: auto_pylookml_dFnVhS7 {
i 26 |     query: {
27 |       dimensions: [trip_start_count_prediction.station_id, station.location]
28 |       measures: [trip_start_count_prediction.predicted_daily_surplus]
i 29 |       description: "https://dat.dev.looker.com/x/dFnVhS7"
30 |       filters: [ trip_start_count_prediction.predicted_daily_surplus: ">=2.25,<-2.6" ]
31 |     }

```

## 3.4 Full API Reference

## 3.5 Change Log

Starting with PyLookML version 3.0.0

3.0.0

- complete and more stable re-write geared toward maximum backward compatibility
- language complete for all the latest LookML language updates (as of Looker 7.20) (new filters, materializations etc)
- significantly better whitespace handling
- can connect to filesystem without git
- added a CLI with various functions, including project dir list and autotune
- added new operator overloading syntax
- more helpful error messages



- options such as OMIT\_DEFAULTS = true