

Chapter10 – Using Elasticsearch for Exploratory Data Analysis

Example Request - cf_etf_morningstar_category_list

POST http://localhost:9200/cf_etf/_search

HEADERS

Content-Type
application/json

BODY

```
{
  "size": 0,
  "aggs": {
    "get_categories": { "terms": { "field": "morningstar_category",
"size":100}}
  }
}
```

```
curl --location --request POST "http://localhost:9200/cf_etf/_search" --header
"Content-Type: application/json" --data
$'{"size":0,"aggs":{"get_categories":{"terms":{"field":"morningstar_categor
y","size":100}}}}'
```

Example Request - cf_etf_Diversified_Emerging_Mkts ETFs

POST http://localhost:9200/cf_etf/_search

HEADERS

Content-Type
application/json

BODY

```
{
  "size": 0,
  "query": {"match": {"morningstar_category": "Diversified Emerging Mkts"}},
  "aggs": {
    "LIST_ETFs": {
      "terms": {"field": "symbol", "size": 16}
    }
  }
}
```

```
curl --location --request POST "http://localhost:9200/cf_etf/_search" --header
"Content-Type: application/json" --data
$'\{"size\":0,\\"query\":{\\"match\":{\\"morningstar_category\":"Diversified Emerging
Mkts\\"}},\\"aggs\":{\\"LIST_ETFs\":{\\"terms\":{\\"field\":"symbol\\",\\"size\\":16}}}}'
```

Example Request - cf_etf_hist_price_Diversified_Emerging_Mkts_changes_2018_12_26

POST http://localhost:9200/cf_etf_hist_price/_search

HEADERS

Content-Type

application/json

BODY

```
{
  "size": 16,
  "query": {
    "bool": {
      "must": { "range": { "date": { "gte": "2018-12-26", "lte": "2018-12-26" } } },
      "should": [
        { "term": { "symbol": "dem" } },
        { "term": { "symbol": "dgre" } },
        { "term": { "symbol": "dgs" } },
        { "term": { "symbol": "dvem" } },
        { "term": { "symbol": "ediv" } },
        { "term": { "symbol": "eemx" } },
        { "term": { "symbol": "emcg" } },
        { "term": { "symbol": "emd" } },
        { "term": { "symbol": "esge" } },
      ]
    }
  }
}
```

```

        {"term": {"symbol": "ewx"}},
        {"term": {"symbol": "pxh"}},
        {"term": {"symbol": "qemm"}},
        {"term": {"symbol": "rfem"}},
        {"term": {"symbol": "spem"}},
        {"term": {"symbol": "uevm"}},
        {"term": {"symbol": "xsoe"}}
    ],
    "minimum_should_match": 1
  }
},
"aggs" : {
  "day_momentum" : {
    "date_histogram" : {
      "field" : "date",
      "interval" : "1d",
      "format" : "yyyy-MM-dd",
      "min_doc_count": 1
    },
    "aggs" : {
      "cv" : {
        "scripted_metric": {
          "init_script": "state.totals=[]",
          "map_script":
"state.totals.add(doc.change.value*doc.volume.value)",
          "combine_script": "double total=0,
total_count=0; for (t in state.totals) {total += t; total_count += 1} return
total/total_count",
          "reduce_script": "return states[0]"
        }
      }
    }
  }
}
}
}

```

```

curl --location --request POST "http://localhost:9200/cf_etf_hist_price/_search" --
header "Content-Type: application/json" --data
$'{"size":16,"query":{"bool":{"must":{"range":{"date":{"gte":"2018-12-
26","lte":"2018-12-
26"}}},"should":[{"term":{"symbol":"dem"}},{term":{"symbol":"dgre"}},{
term":{"symbol":"dgs"}},{term":{"symbol":"dvem"}},{term":{"symbol":"
ediv"}},{term":{"symbol":"eemx"}},{term":{"symbol":"emcg"}},{term{"
symbol":"emd"}},{term":{"symbol":"esge"}},{term":{"symbol":"ewx"
}},{term":{"symbol":"pxh"}},{term":{"symbol":"qemm"}},{term":{"symbo

```

```
l\\":\\"rfem\\"}},{"term\\":{"symbol\\":\\"spem\\"}},{"term\\":{"symbol\\":\\"uevm\\"}},{"term\\":{"symbol\\":\\"xsoe\\"}}],\\"minimum_should_match\\":1}},\\"aggs\\":{"day_momentum\\":{"date_histogram\\":{"field\\":\\"date\\",\\"interval\\":\\"1d\\",\\"format\\":\\"yyyy-MM-dd\\",\\"min_doc_count\\":1}},\\"aggs\\":{"cv\\":{"scripted_metric\\":{"init_script\\":\\"state.totals=[]\\",\\"map_script\\":\\"state.totals.add(doc.change.value*doc.volume.value)\\",\\"combine_script\\":\\"double total=0, total_count=0; for (t in state.totals) {total += t; total_count += 1} return total/total_count\\",\\"reduce_script\\":\\"return states[0]\\"}}}}}}'
```

Example Request - cf_etf_hist_price_Diversified_Emerging_Mkts_changes_daily

POST http://localhost:9200/cf_etf_hist_price/_search

HEADERS

Content-Type

application/json

BODY

```
{
  "size": 0,
  "query": {
    "bool": {
      "must": { "range": { "date": { "gte": "2018-12-26", "lte": "2019-03-25" } } },
      "should": [
        { "term": { "symbol": "dem" } },
        { "term": { "symbol": "dgre" } },
        { "term": { "symbol": "dgs" } },
        { "term": { "symbol": "dvem" } },
        { "term": { "symbol": "ediv" } },
        { "term": { "symbol": "eemx" } },
        { "term": { "symbol": "emcg" } },
        { "term": { "symbol": "emdv" } },
        { "term": { "symbol": "esge" } },
        { "term": { "symbol": "ewx" } },
        { "term": { "symbol": "pxh" } },
        { "term": { "symbol": "qemm" } },
        { "term": { "symbol": "rfem" } },
        { "term": { "symbol": "spem" } },
        { "term": { "symbol": "uevm" } },
        { "term": { "symbol": "xsoe" } }
      ],
      "minimum_should_match": 1
    }
  }
}
```

```

    },
    "aggs" : {
      "daily_momentum" : {
        "date_histogram" : {
          "field" : "date",
          "interval" : "1d",
          "format" : "yyyy-MM-dd",
          "min_doc_count": 1
        },
        "aggs": {
          "cv" : {
            "scripted_metric":{
              "init_script": "state.totals=[]",
              "map_script":
"state.totals.add(doc.change.value*doc.volume.value)",
              "combine_script": "double total=0,
total_count=0; for (t in state.totals) {total += t; total_count += 1} return
total/total_count",
              "reduce_script": "return states[0]"
            }
          }
        }
      }
    }
  }
}

```

```

curl --location --request POST "http://localhost:9200/cf_etf_hist_price/_search" --
header "Content-Type: application/json" --data
$'\{"size":0,\\"query\\":{\\"bool\\":{\\"must\\":{\\"range\\":{\\"date\\":{\\"gte\\":\\"2018-12-26\\",\\"lte\\":\\"2019-03-25\\"}\\},\\"should\\":[{\\"term\\":{\\"symbol\\":\\"dem\\""}\\},{\\"term\\":{\\"symbol\\":\\"dgre\\""}\\},{\\"term\\":{\\"symbol\\":\\"dgs\\""}\\},{\\"term\\":{\\"symbol\\":\\"dvem\\""}\\},{\\"term\\":{\\"symbol\\":\\"ediv\\""}\\},{\\"term\\":{\\"symbol\\":\\"eemx\\""}\\},{\\"term\\":{\\"symbol\\":\\"emcg\\""}\\},{\\"term\\":{\\"symbol\\":\\"emd\\":{\\"symbol\\":\\"emd\\":{\\"symbol\\":\\"esge\\""}\\},{\\"term\\":{\\"symbol\\":\\"ewx\\""}\\},{\\"term\\":{\\"symbol\\":\\"pxh\\""}\\},{\\"term\\":{\\"symbol\\":\\"qemm\\""}\\},{\\"term\\":{\\"symbol\\":\\"rfem\\""}\\},{\\"term\\":{\\"symbol\\":\\"spem\\""}\\},{\\"term\\":{\\"symbol\\":\\"uevm\\""}\\},{\\"term\\":{\\"symbol\\":\\"xsoe\\""}\\}],\\"minimum_should_match\\":1}\\},\\"aggs\\":{\\"daily_momentum\\":{\\"date_histogram\\":{\\"field\\":\\"date\\",\\"interval\\":\\"1d\\",\\"format\\":\\"yyyy-MM-dd\\",\\"min_doc_count\\":1}\\},\\"aggs\\":{\\"cv\\":{\\"scripted_metric\\":{\\"init_script\\":\\"state.totals=[]\\",\\"map_script\\":\\"state.totals.add(doc.change.value*doc.volume.value)\\",\\"combine_script\\":\\"double total=0, total_count=0; for (t in state.totals) {total += t; total_count += 1} return total/total_count\\",\\"reduce_script\\":\\"return states[0]\\"}\\}}\\}}\\}}'

```

Example Request - cf_etf_hist_prirce_Diversified_Emerging_Mkts_changes_weekly

POST http://localhost:9200/cf_etf_hist_price/_search

HEADERS

Content-Type

application/json

BODY

```
{
  "size": 100,
  "query": {
    "bool": {
      "must": { "range": { "date": { "gte": "2018-12-26", "lte": "2019-03-25" } } },
      "should": [
        { "term": { "symbol": "dem" } },
        { "term": { "symbol": "dgre" } },
        { "term": { "symbol": "dgs" } },
        { "term": { "symbol": "dvem" } },
        { "term": { "symbol": "ediv" } },
        { "term": { "symbol": "eemx" } },
        { "term": { "symbol": "emcg" } },
        { "term": { "symbol": "emdv" } },
        { "term": { "symbol": "esge" } },
        { "term": { "symbol": "ewx" } },
        { "term": { "symbol": "pxh" } },
        { "term": { "symbol": "qemm" } },
        { "term": { "symbol": "rfem" } },
        { "term": { "symbol": "spem" } },
        { "term": { "symbol": "uevm" } },
        { "term": { "symbol": "xsoe" } }
      ],
      "minimum_should_match": 1
    }
  },
  "aggs": {
    "weekly_momentum": {
      "date_histogram": {
        "field": "date",
        "interval": "1w",
        "format": "yyyy-MM-dd",
        "min_doc_count": 1
      },
      "aggs": {
```

```

        "cv" : {
            "scripted_metric":{
                "init_script": "state.totals=[]",
                "map_script":
"state.totals.add(doc.change.value*doc.volume.value)",
                "combine_script": "double total=0, total_count=0;
for (t in state.totals) {total += t; total_count += 1} return total/total_count",
                "reduce_script": "return states[0]"
            }
        }
    }
}

```

```

curl --location --request POST "http://localhost:9200/cf_etf_hist_price/_search" --
header "Content-Type: application/json" --data
'${"size":100,"query":{"bool":{"must":{"range":{"date":{"gte":"2018-12-
26","lte":"2019-03-
25"}}},"should":[{"term":{"symbol":"dem"}},{term":{"symbol":"dgre"}},{
term":{"symbol":"dgs"}},{term":{"symbol":"dvem"}},{term":{"symbol":"
ediv"}},{term":{"symbol":"eemx"}},{term":{"symbol":"emcg"}},{term{"
symbol":"emd"}},{term":{"symbol":"esge"}},{term":{"symbol":"ewx"}
},{term":{"symbol":"pxh"}},{term":{"symbol":"qemm"}},{term":{"symbo
l":"rfem"}},{term":{"symbol":"spem"}},{term":{"symbol":"uevm"}},{te
rm":{"symbol":"xsoe"}]}],"minimum_should_match":1},"aggs":{"weekly_momentum\
":{"date_histogram":{"field":"date","interval":"1w","format":"yyyy-MM-
dd"},"min_doc_count":1},"aggs":{"cv":{"scripted_metric":{"init_script":
"state.totals=[]","map_script":
"state.totals.add(doc.change.value*doc.volume.value)","combine_script": "double
total=0, total_count=0; for (t in state.totals) {total += t; total_count += 1} return
total/total_count","reduce_script": "return states[0]"}}}}}}'

```

Example Request - cf_etf_Large Blend ETFs

POST http://localhost:9200/cf_etf/_search

HEADERS

Content-Type

application/json

BODY

```
{
  "size": 0,
  "query": {"match": {"morningstar_category": "Large Blend"}},
  "aggs" : {
    "LIST_ETFs": {
      "terms": {"field": "symbol", "size": 14}
    }
  }
}
```

```
curl --location --request POST "http://localhost:9200/cf_etf/_search" --header
"Content-Type: application/json" --data
$'\{"size\:0,\\"query\\":{\\"match\\":{\\"morningstar_category\\":\\"Large
Blend\\"}},\\"aggs\\":{\\"LIST_ETFs\\":{\\"terms\\":{\\"field\\":\\"symbol\\",\\"size\\":14}}}}'
```

Example Request - cf_etf_hist_price_Large Blend_changes_daily

POST http://localhost:9200/cf_etf_hist_price/_search

HEADERS

Content-Type
application/json

BODY

```
{
  "size": 0,
  "query": {
    "bool": {
      "must": { "range": { "date": { "gte": "2018-12-26", "lte": "2019-03-25" } } },
      "should": [
        { "term": { "symbol": "eps" } },
        { "term": { "symbol": "esgu" } },
        { "term": { "symbol": "ext" } },
        { "term": { "symbol": "lglv" } },
        { "term": { "symbol": "qual" } },
        { "term": { "symbol": "qus" } },
        { "term": { "symbol": "she" } },
        { "term": { "symbol": "sphb" } },
        { "term": { "symbol": "splg" } },
        { "term": { "symbol": "sptm" } },
        { "term": { "symbol": "spyx" } },

```



```
te.totals=[]\", \"map_script\": \"state.totals.add(doc.change.value*doc.volume.value)\",  
\"combine_script\": \"double total=0, total_count=0; for (t in state.totals) {total +=  
t; total_count += 1} return total/total_count\", \"reduce_script\": \"return  
states[0]\\\"}}}}}}'
```

Example Request - cf_etf_hist_price_Large Blend_changes_weekly

POST http://localhost:9200/cf_etf_hist_price/_search

HEADERS

Content-Type

application/json

BODY

```
{  
  "size": 0,  
  "query": {  
    "bool": {  
      "must": { "range": { "date": { "gte": "2018-12-26", "lte": "2019-03-  
25" } } },  
      "should": [  
        { "term": { "symbol": "eps" } },  
        { "term": { "symbol": "esgu" } },  
        { "term": { "symbol": "ext" } },  
        { "term": { "symbol": "lglv" } },  
        { "term": { "symbol": "qual" } },  
        { "term": { "symbol": "qus" } },  
        { "term": { "symbol": "she" } },  
        { "term": { "symbol": "sphb" } },  
        { "term": { "symbol": "splg" } },  
        { "term": { "symbol": "sptm" } },  
        { "term": { "symbol": "spyx" } },  
        { "term": { "symbol": "sye" } },  
        { "term": { "symbol": "ulvm" } },  
        { "term": { "symbol": "usmf" } }  
      ],  
      "minimum_should_match": 1  
    }  
  },  
  "aggs" : {  
    "weekly_momentum" : {  
      "date_histogram" : {  
        "field" : "date",  
        "interval" : "1w",
```

```

        "format" : "yyyy-MM-dd",
        "min_doc_count": 1
    },
    "aggs": {
        "cv" : {
            "scripted_metric":{
                "init_script": "state.totals=[]",
                "map_script":
"state.totals.add(doc.change.value*doc.volume.value)",
                "combine_script": "double total=0,
total_count=0; for (t in state.totals) {total += t; total_count += 1} return
total/total_count",
                "reduce_script": "return states[0]"
            }
        }
    }
}

```

```

curl --location --request POST "http://localhost:9200/cf_etf_hist_price/_search" --
header "Content-Type: application/json" --data
$'{
  "size":0,
  "query":{
    "bool":{
      "must":{
        "range":{
          "date":{
            "gte":"2018-12-26",
            "lte":"2019-03-25"
          }
        },
        "should":[
          {
            "term":{
              "symbol":"eps"
            }
          },
          {
            "term":{
              "symbol":"esgu"
            }
          },
          {
            "term":{
              "symbol":"ext"
            }
          },
          {
            "term":{
              "symbol":"lglv"
            }
          },
          {
            "term":{
              "symbol":"qual"
            }
          },
          {
            "term":{
              "symbol":"qus"
            }
          },
          {
            "term":{
              "symbol":"she"
            }
          },
          {
            "term":{
              "symbol":"sphb"
            }
          },
          {
            "term":{
              "symbol":"splg"
            }
          },
          {
            "term":{
              "symbol":"sptm"
            }
          },
          {
            "term":{
              "symbol":"spyx"
            }
          },
          {
            "term":{
              "symbol":"sye"
            }
          },
          {
            "term":{
              "symbol":"ulvm"
            }
          },
          {
            "term":{
              "symbol":"usmf"
            }
          }
        ],
        "minimum_should_match":1
      },
      "aggs":{
        "weekly_momentum":{
          "date_histogram":{
            "field":"date",
            "interval":"1w",
            "format":"yyyy-MM-dd",
            "min_doc_count":1
          },
          "aggs":{
            "cv":{
              "scripted_metric":{
                "init_script":
"state.totals=[]",
                "map_script":
"state.totals.add(doc.change.value*doc.volume.value)",
                "combine_script":
"double total=0, total_count=0; for (t in state.totals) {total += t; total_count += 1} return
total/total_count",
                "reduce_script":
"return states[0]"
              }
            }
          }
        }
      }
    }
  }
}'

```

Example Request - cf_etf_Miscellaneous Region ETFs

POST http://localhost:9200/cf_etf/_search

HEADERS

Content-Type

application/json

BODY

```
{
  "size": 0,
  "query": {"match": {"morningstar_category": "Miscellaneous Region"}},
  "aggs": {
    "DEM ETFs": {
      "terms": {"field": "symbol", "size": 14}
    }
  }
}
```

```
curl --location --request POST "http://localhost:9200/cf_etf/_search" --header
"Content-Type: application/json" --data
$'\{"size\:0,\\"query\":{\\"match\":{\\"morningstar_category\":"Miscellaneous
Region\\"}},\\"aggs\":{\\"DEM ETFs\":{\\"terms\":{\\"field\":"symbol\\",\\"size\:14\\}}}}'
```

Example Request - cf_etf_hist_price_Miscellaneous Region_changes_daily

POST http://localhost:9200/cf_etf_hist_price/_search

HEADERS

Content-Type

application/json

BODY

```
{
  "size": 1,
  "query": {
    "bool": {
      "must": {"range": {"date": {"gte": "2018-12-26", "lte": "2019-03-25"}}},
      "should": [
        {"term": {"symbol": "agt"}},
        {"term": {"symbol": "ause"}},
        {"term": {"symbol": "dxge"}},
        {"term": {"symbol": "enor"}},
        {"term": {"symbol": "erus"}}
      ]
    }
  }
}
```

```

        {"term": {"symbol": "ewl"}},
        {"term": {"symbol": "fcan"}},
        {"term": {"symbol": "fgm"}},
        {"term": {"symbol": "fko"}},
        {"term": {"symbol": "fni"}},
        {"term": {"symbol": "fsz"}},
        {"term": {"symbol": "gulf"}},
        {"term": {"symbol": "heww"}},
        {"term": {"symbol": "icol"}}
    ],
    "minimum_should_match": 1
}

},
"aggs" : {
  "daily_momentum" : {
    "date_histogram" : {
      "field" : "date",
      "interval" : "1d",
      "format" : "yyyy-MM-dd",
      "min_doc_count" : 1
    },
    "aggs" : {
      "cv" : {
        "scripted_metric": {
          "init_script": "state.totals=[]",
          "map_script":
"state.totals.add(doc.change.value*doc.volume.value)",
          "combine_script": "double total=0,
total_count=0; for (t in state.totals) {total += t; total_count += 1} return
total/total_count",
          "reduce_script": "return states[0]"
        }
      }
    }
  }
}
}
}
}

```

```

curl --location --request POST "http://localhost:9200/cf_etf_hist_price/_search" --
header "Content-Type: application/json" --data
$'{"size":1,"query":{"bool":{"must":{"range":{"date":{"gte":"2018-12-
26","lte":"2019-03-
25"}}},"should":[{"term":{"symbol":"agt"}},{"term":{"symbol":"ause"}},{
"term":{"symbol":"dxge"}},{"term":{"symbol":"enor"}},{"term":{"symbol"

```

```
:{"erus\"},"},{\term\":{"symbol\":"ewl\"},"},{\term\":{"symbol\":"fcan\"},"},{\term\":"symbol\":"fgm\"},"},{\term\":{"symbol\":"fko\"},"},{\term\":{"symbol\":"fni\"},"},{\term\":{"symbol\":"fsz\"},"},{\term\":{"symbol\":"gulf\"},"},{\term\":{"symbol\":"heww\"},"},{\term\":{"symbol\":"icol\"}},\minimum_should_match\":1}},\aggs\":{"daily_momentum\":{"date_histogram\":{"field\":"date\","interval\":"1d\","format\":"yyyy-MM-dd\","min_doc_count\":1}},\aggs\":{"cv\":{"scripted_metric\":{"init_script\":"state.totals={}","map_script\":"state.totals.add(doc.change.value*doc.volume.value)","combine_script\":"double total=0, total_count=0; for (t in state.totals) {total += t; total_count += 1} return total/total_count","reduce_script\":"return states[0]" }}}}}}
```

Example Request - cf_etf_hist_prirce_Miscellaneous Region_changes_weekly

POST http://localhost:9200/cf_etf_hist_price/_search

HEADERS

Content-Type

application/json

BODY

```
{
  "size": 0,
  "query": {
    "bool": {
      "must": { "range": { "date": { "gte": "2018-12-26", "lte": "2019-03-25" } } },
      "should": [
        { "term": { "symbol": "dem" } },
        { "term": { "symbol": "dgre" } },
        { "term": { "symbol": "dgs" } },
        { "term": { "symbol": "dvem" } },
        { "term": { "symbol": "ediv" } },
        { "term": { "symbol": "eemx" } },
        { "term": { "symbol": "emcg" } },
        { "term": { "symbol": "emdv" } },
        { "term": { "symbol": "esge" } },
        { "term": { "symbol": "ewx" } }
      ],
      "minimum_should_match": 1
    }
  },
  "aggs" : {
    "weekly_momentum" : {
```

```

    "date_histogram" : {
      "field" : "date",
      "interval" : "1w",
      "format" : "yyyy-MM-dd",
      "min_doc_count": 1
    },
    "aggs": {
      "cv" : {
        "scripted_metric":{
          "init_script": "state.totals=[]",
          "map_script":
"state.totals.add(doc.change.value*doc.volume.value)",
          "combine_script": "double total=0,
total_count=0; for (t in state.totals) {total += t; total_count += 1} return
total/total_count",
          "reduce_script": "return states[0]"
        }
      }
    }
  }
}

```

```

curl --location --request POST "http://localhost:9200/cf_etf_hist_price/_search" --
header "Content-Type: application/json" --data
$'\{"size\:0,\\"query\":{\\"bool\":{\\"must\":{\\"range\":{\\"date\":{\\"gte\":\\"2018-12-
26\\",\\"lte\":\\"2019-03-
25\\",\\"should\":[{\\"term\":{\\"symbol\":\\"dem\\"}},{\\"term\":{\\"symbol\":\\"dgre\\"}},{\
\\"term\":{\\"symbol\":\\"dgs\\"}},{\\"term\":{\\"symbol\":\\"dvem\\"}},{\\"term\":{\\"symbol\":
\\"ediv\\"}},{\\"term\":{\\"symbol\":\\"eemx\\"}},{\\"term\":{\\"symbol\":\\"emcg\\"}},{\\"term\
":{\\"symbol\":\\"emd\\",\\"term\":{\\"symbol\":\\"esge\\"}},{\\"term\":{\\"symbol\":\\"ewx\\"
}}],\\"minimum_should_match\:1}},\\"aggs\":{\\"weekly_momentum\":{\\"date_histogram\":{\\"
field\":\\"date\\",\\"interval\":\\"1w\\",\\"format\":\\"yyyy-MM-
dd\\",\\"min_doc_count\:1}},\\"aggs\":{\\"cv\":{\\"scripted_metric\":{\\"init_script\
":\\"state.totals=\\", \\"map_script\
":\\"state.totals.add(doc.change.value*doc.volume.value\\", \\"combine_script\
": \\"double
total=0, total_count=0; for (t in state.totals) {total += t; total_count += 1} return
total/total_count\\", \\"reduce_script\": \\"return states[0]\\", \\"}}}}}}'

```

Example Request - cf_etf_Europe Stock ETFs

POST http://localhost:9200/cf_etf/_search

HEADERS

Content-Type
application/json

BODY

```
{
  "size": 0,
  "query": {"match": {"morningstar_category": "Europe Stock"}},
  "aggs": {
    "DEM ETFs": {
      "terms": {"field": "symbol", "size": 11}
    }
  }
}
```

```
curl --location --request POST "http://localhost:9200/cf_etf/_search" --header
"Content-Type: application/json" --data
$'{\"size\":0,\"query\":{\"match\":{\"morningstar_category\":\"Europe
Stock\"}},\"aggs\":{\"DEM ETFs\":{\"terms\":{\"field\":\"symbol\",\"size\":11}}}}'
```

Example Request - cf_etf_hist_prirce_Europe Stock_changes_daily

POST http://localhost:9200/cf_etf_hist_price/_search

HEADERS

Content-Type
application/json

BODY

```
{
  "size": 0,
  "query": {
    "bool": {
      "must": { "range": { "date": { "gte": "2018-12-26", "lte": "2019-03-25" } } },
      "should": [
        { "term": { "symbol": "ddez" } },
        { "term": { "symbol": "dfe" } },
      ]
    }
  }
}
```



```

        {"term": {"symbol": "edom"}},
        {"term": {"symbol": "eudg"}},
        {"term": {"symbol": "eusc"}},
        {"term": {"symbol": "ezu"}},
        {"term": {"symbol": "feu"}},
        {"term": {"symbol": "hedj"}},
        {"term": {"symbol": "hezu"}},
        {"term": {"symbol": "ieur"}},
        {"term": {"symbol": "smez"}}
    ],
    "minimum_should_match": 1
  }
},
"aggs" : {
  "daily_momentum" : {
    "date_histogram" : {
      "field" : "date",
      "interval" : "1d",
      "format" : "yyyy-MM-dd",
      "min_doc_count" : 1
    },
    "aggs" : {
      "cv" : {
        "scripted_metric": {
          "init_script": "state.totals=[]",
          "map_script":
"state.totals.add(doc.change.value*doc.volume.value)",
          "combine_script": "double total=0,
total_count=0; for (t in state.totals) {total += t; total_count += 1} return
total/total_count",
          "reduce_script": "return states[0]"
        }
      }
    }
  }
}
}
}

```

```

curl --location --request POST "http://localhost:9200/cf_etf_hist_price/_search" --
header "Content-Type: application/json" --data
$'{\
  "size": 0, \
  "query": {\
    "bool": {\
      "must": {\
        "range": {\
          "date": {\
            "gte": "2018-12-26", \
            "lte": "2019-03-25" \
          } \
        }, \
        "should": [\
          {\
            "term": {\
              "symbol": "ddez" \
            } \
          }, \
          {\
            "term": {\
              "symbol": "dfe" \
            } \
          }, \
          {\
            "term": {\
              "symbol": "edom" \
            } \
          }, \
          {\
            "term": {\
              "symbol": "eudg" \
            } \
          }, \
          {\
            "term": {\
              "symbol": "eusc" \
            } \
          }, \
          {\
            "term": {\
              "symbol": "ezu" \
            } \
          }, \
          {\
            "term": {\
              "symbol": "feu" \
            } \
          } \
        ] \
      } \
    } \
  } \
}'

```

```
{\"symbol\": \"hedj\"}}, {\"term\": {\"symbol\": \"hezu\"}}, {\"term\": {\"symbol\": \"ieur\"}}, {\"term\": {\"symbol\": \"smez\"}}], \"minimum_should_match\": 1}}, {\"aggs\": {\"daily_momentum\": {\"date_histogram\": {\"field\": \"date\", \"interval\": \"1d\", \"format\": \"yyyy-MM-dd\", \"min_doc_count\": 1}, \"aggs\": {\"cv\": {\"scripted_metric\": {\"init_script\": \"state.totals=[]\", \"map_script\": \"state.totals.add(doc.change.value*doc.volume.value)\", \"combine_script\": \"double total=0, total_count=0; for (t in state.totals) {total += t; total_count += 1} return total/total_count\", \"reduce_script\": \"return states[0]\"}}}}}}'}
```

Example Request - cf_etf_hist_price_Europe Stock_changes_weekly

POST http://localhost:9200/cf_etf_hist_price/_search

HEADERS

Content-Type

application/json

BODY

```
{
  "size": 0,
  "query": {
    "bool": {
      "must": { "range": { "date": { "gte": "2018-12-26", "lte": "2019-03-25" } } },
      "should": [
        { "term": { "symbol": "ddez" } },
        { "term": { "symbol": "dfe" } },
        { "term": { "symbol": "edom" } },
        { "term": { "symbol": "eudg" } },
        { "term": { "symbol": "eusc" } },
        { "term": { "symbol": "ezu" } },
        { "term": { "symbol": "feu" } },
        { "term": { "symbol": "hedj" } },
        { "term": { "symbol": "hezu" } },
        { "term": { "symbol": "ieur" } },
        { "term": { "symbol": "smez" } }
      ],
      "minimum_should_match": 1
    }
  },
  "aggs" : {
    "weekly_momentum" : {
      "date_histogram" : {
```

```

        "field" : "date",
        "interval" : "1w",
        "format" : "yyyy-MM-dd",
        "min_doc_count": 1
    },
    "aggs": {
        "cv" : {
            "scripted_metric":{
                "init_script": "state.totals=[]",
                "map_script":
"state.totals.add(doc.change.value*doc.volume.value)",
                "combine_script": "double total=0,
total_count=0; for (t in state.totals) {total += t; total_count += 1} return
total/total_count",
                "reduce_script": "return states[0]"
            }
        }
    }
}
}
}

```

```

curl --location --request POST "http://localhost:9200/cf_etf_hist_price/_search" --
header "Content-Type: application/json" --data
$'\{"size\":0,\\"query\":{\\"bool\":{\\"must\":{\\"range\":{\\"date\":{\\"gte\":\\"2018-12-
26\\",\\"lte\":\\"2019-03-
25\\"}}},\\"should\":[{\\"term\":{\\"symbol\":\\"ddez\\"}},{\\"term\":{\\"symbol\":\\"dfe\\"}},{\
\\"term\":{\\"symbol\":\\"edom\\"}},{\\"term\":{\\"symbol\":\\"eudg\\"}},{\\"term\":{\\"symbol\
":\\"eusc\\"}},{\\"term\":{\\"symbol\":\\"ezu\\"}},{\\"term\":{\\"symbol\":\\"feu\\"}},{\\"term\":
{\\"symbol\":\\"hedj\\"}},{\\"term\":{\\"symbol\":\\"hezu\\"}},{\\"term\":{\\"symbol\":\\"ieur\
"}},{\\"term\":{\\"symbol\":\\"smez\\"}}],\\"minimum_should_match\":1}},\\"aggs\":{\\"weekly_m
omentum\":{\\"date_histogram\":{\\"field\":\\"date\\",\\"interval\":\\"1w\\",\\"format\":\\"yyy
y-MM-dd\\",\\"min_doc_count\":1}},\\"aggs\":{\\"cv\":{\\"scripted_metric\":{\\"init_script\
":\\"state.totals=[]\\", \\"map_script\
":\\"state.totals.add(doc.change.value*doc.volume.value)\\", \\"combine_script\": \\"double
total=0, total_count=0; for (t in state.totals) {total += t; total_count += 1} return
total/total_count\\", \\"reduce_script\": \\"return states[0]\\"}}}}}}'

```

Example Request - cf_etf_Technology ETFs

POST http://localhost:9200/cf_etf/_search

HEADERS

Content-Type

application/json

BODY

```
{
  "size": 0,
  "query": {"match": {"morningstar_category": "Technology"}},
  "aggs" : {
    "DEM ETFs": {
      "terms": {"field": "symbol", "size": 11}
    }
  }
}
```

```
curl --location --request POST "http://localhost:9200/cf_etf/_search" --header
"Content-Type: application/json" --data
$'{"size":0,"query":{"match":{"morningstar_category":"Technology"}},\n"aggs":\n:{"DEM ETFs":{"terms":{"field":"symbol","size":11}}}}'
```

Example Request - cf_etf_hist_price_Technology_changes_daily

POST http://localhost:9200/cf_etf_hist_price/_search

HEADERS

Content-Type

application/json

BODY

```
{
  "size": 0,
  "query": {
    "bool": {
      "must": { "range": { "date": { "gte": "2018-12-26", "lte": "2019-03-25" } } },
      "should": [
        { "term": { "symbol": "cibr" } },
        { "term": { "symbol": "fdn" } },
        { "term": { "symbol": "fone" } },

```

```

        {"term": {"symbol": "ftxl"}},
        {"term": {"symbol": "fxl"}},
        {"term": {"symbol": "qtec"}},
        {"term": {"symbol": "skyy"}},
        {"term": {"symbol": "tdiv"}},
        {"term": {"symbol": "xntk"}},
        {"term": {"symbol": "xsd"}},
        {"term": {"symbol": "xsw"}}
    ],
    "minimum_should_match": 1
  }
},
"aggs" : {
  "daily_momentum" : {
    "date_histogram" : {
      "field" : "date",
      "interval" : "1d",
      "format" : "yyyy-MM-dd",
      "min_doc_count": 1
    },
    "aggs": {
      "cv" : {
        "scripted_metric": {
          "init_script": "state.totals=[]",
          "map_script":
"state.totals.add(doc.change.value*doc.volume.value)",
          "combine_script": "double total=0,
total_count=0; for (t in state.totals) {total += t; total_count += 1} return
total/total_count",
          "reduce_script": "return states[0]"
        }
      }
    }
  }
}
}
}

```

```

curl --location --request POST "http://localhost:9200/cf_etf_hist_price/_search" --
header "Content-Type: application/json" --data
$'{
  "size": 0,
  "query": {
    "bool": {
      "must": {
        "range": {
          "date": {
            "gte": "2018-12-26",
            "lte": "2019-03-25"
          }
        }
      },
      "should": [
        {
          "term": {
            "symbol": "cibr"
          }
        },
        {
          "term": {
            "symbol": "fdn"
          }
        },
        {
          "term": {
            "symbol": "fone"
          }
        },
        {
          "term": {
            "symbol": "ftxl"
          }
        },
        {
          "term": {
            "symbol": "fxl"
          }
        },
        {
          "term": {
            "symbol": "qtec"
          }
        },
        {
          "term": {
            "symbol": "skyy"
          }
        },
        {
          "term": {
            "symbol": "tdiv"
          }
        },
        {
          "term": {
            "symbol": "xntk"
          }
        },
        {
          "term": {
            "symbol": "xsd"
          }
        },
        {
          "term": {
            "symbol": "xsw"
          }
        }
      ]
    }
  },
  "aggs": {
    "daily_momentum": {
      "date_histogram": {
        "field": "date",
        "interval": "1d",
        "format": "yyyy-MM-dd",
        "min_doc_count": 1
      },
      "aggs": {
        "cv": {
          "scripted_metric": {
            "init_script": "state.totals=[]",
            "map_script": "state.totals.add(doc.change.value*doc.volume.value)",
            "combine_script": "double total=0, total_count=0; for (t in state.totals) {total += t; total_count += 1} return total/total_count",
            "reduce_script": "return states[0]"
          }
        }
      }
    }
  }
}
'

```

```
:{"fxl\":{},{\term\:{\symbol\:"qtec\"}},{\term\:{\symbol\:"skyy\"}},{\term\:{\symbol\:"tdiv\"}},{\term\:{\symbol\:"xntk\"}},{\term\:{\symbol\:"xsd\"}},{\term\:{\symbol\:"xsw\"}},\minimum_should_match\":1}},\aggs\:{\daily_momentum\:{\date_histogram\:{\field\:"date\","\interval\:"1d\","\format\:"yyyy-MM-dd\","\min_doc_count\":1},\aggs\:{\cv\:{\scripted_metric\:{\init_script\:"state.totals={}","\map_script\:"state.totals.add(doc.change.value*doc.volume.value)\","\combine_script\:"double total=0, total_count=0; for (t in state.totals) {total += t; total_count += 1} return total/total_count\","\reduce_script\:"return states[0]\"}}}}}}'
```

Example Request - cf_etf_hist_price_Technology_changes_weekly

POST http://localhost:9200/cf_etf_hist_price/_search

HEADERS

Content-Type

application/json

BODY

```
{
  "size": 0,
  "query": {
    "bool": {
      "must": { "range": { "date": { "gte": "2018-12-26", "lte": "2019-03-25" } } },
      "should": [
        { "term": { "symbol": "cibr" } },
        { "term": { "symbol": "fdn" } },
        { "term": { "symbol": "fone" } },
        { "term": { "symbol": "ftxl" } },
        { "term": { "symbol": "fxl" } },
        { "term": { "symbol": "qtec" } },
        { "term": { "symbol": "skyy" } },
        { "term": { "symbol": "tdiv" } },
        { "term": { "symbol": "xntk" } },
        { "term": { "symbol": "xsd" } },
        { "term": { "symbol": "xsw" } }
      ],
      "minimum_should_match": 1
    }
  },
  "aggs" : {
    "weekly_momentum" : {
      "date_histogram" : {
```

```

        "field" : "date",
        "interval" : "1w",
        "format" : "yyyy-MM-dd",
        "min_doc_count": 1
    },
    "aggs": {
        "cv" : {
            "scripted_metric":{
                "init_script": "state.totals=[]",
                "map_script":
"state.totals.add(doc.change.value*doc.volume.value)",
                "combine_script": "double total=0,
total_count=0; for (t in state.totals) {total += t; total_count += 1} return
total/total_count",
                "reduce_script": "return states[0]"
            }
        }
    }
}
}
}

```

```

curl --location --request POST "http://localhost:9200/cf_etf_hist_price/_search" --
header "Content-Type: application/json" --data
$'\{"size":0,\\"query\\":{\\"bool\\":{\\"must\\":{\\"range\\":{\\"date\\":{\\"gte\\":\\"2018-12-
26\\",\\"lte\\":\\"2019-03-
25\\"}}},\\"should\\":[{\\"term\\":{\\"symbol\\":\\"cibr\\"}},{\\"term\\":{\\"symbol\\":\\"fdn\\"}},{\
\\"term\\":{\\"symbol\\":\\"fone\\"}},{\\"term\\":{\\"symbol\\":\\"ftxl\\"}},{\\"term\\":{\\"symbol\\
\\"fxl\\"}},{\\"term\\":{\\"symbol\\":\\"qtec\\"}},{\\"term\\":{\\"symbol\\":\\"skyy\\"}},{\\"term\\
\\"symbol\\":\\"tdiv\\"}},{\\"term\\":{\\"symbol\\":\\"xntk\\"}},{\\"term\\":{\\"symbol\\":\\"xsd\\
\\"}},{\\"term\\":{\\"symbol\\":\\"xsw\\"}}],\\"minimum_should_match\\":1}},\\"aggs\\":{\\"weekly_mo
mentum\\":{\\"date_histogram\\":{\\"field\\":\\"date\\",\\"interval\\":\\"1w\\",\\"format\\":\\"yyyy
-MM-
dd\\",\\"min_doc_count\\":1}},\\"aggs\\":{\\"cv\\":{\\"scripted_metric\\":{\\"init_script\\":
\\"state.totals=[]\\", \\"map_script\\":
\\"state.totals.add(doc.change.value*doc.volume.value)\\", \\"combine_script\\": \\"double
total=0, total_count=0; for (t in state.totals) {total += t; total_count += 1} return
total/total_count\\", \\"reduce_script\\": \\"return states[0]\\\"}}}}}}}'

```

Example Request - cf_etf_Foreign Large Blend ETFs

POST http://localhost:9200/cf_etf/_search

HEADERS

Content-Type

application/json

BODY

```
{
  "size": 0,
  "query": {"match": {"morningstar_category": "Foreign Large Blend"}},
  "aggs" : {
    "DEM_ETFs": {
      "terms": {"field": "symbol", "size": 11}
    }
  }
}
```

```
curl --location --request POST "http://localhost:9200/cf_etf/_search" --header
"Content-Type: application/json" --data
$'\{"size\:0,\"query\\":{\"match\\":{\"morningstar_category\\":\"Foreign Large
Blend\"}},\"aggs\\":{\"DEM_ETFs\\":{\"terms\\":{\"field\\":\"symbol\", \"size\":11}}}}'
```

Example Request - cf_etf_hist_price_Foreign Large Blend_changes_daily

POST http://localhost:9200/cf_etf_hist_price/_search

HEADERS

Content-Type

application/json

BODY

```
{
  "size": 0,
  "query": {
    "bool": {
      "must": { "range": { "date": { "gte": "2018-12-26", "lte": "2019-03-25" } } },
      "should": [
        { "term": { "symbol": "efax" } },
        { "term": { "symbol": "esgd" } },
        { "term": { "symbol": "hdmv" } },
        { "term": { "symbol": "idmo" } },
      ]
    }
  }
}
```



```

        {"term": {"symbol": "ipkw"}},
        {"term": {"symbol": "iqlt"}},
        {"term": {"symbol": "qefa"}},
        {"term": {"symbol": "rdfi"}},
        {"term": {"symbol": "spdw"}}
    ],
    "minimum_should_match": 1
}
},
"aggs" : {
    "daily_momentum" : {
        "date_histogram" : {
            "field" : "date",
            "interval" : "1d",
            "format" : "yyyy-MM-dd",
            "min_doc_count" : 1
        },
        "aggs" : {
            "cv" : {
                "scripted_metric": {
                    "init_script": "state.totals=[]",
                    "map_script":
"state.totals.add(doc.change.value*doc.volume.value)",
                    "combine_script": "double total=0,
total_count=0; for (t in state.totals) {total += t; total_count += 1} return
total/total_count",
                    "reduce_script": "return states[0]"
                }
            }
        }
    }
}
}
}
}

```

```

curl --location --request POST "http://localhost:9200/cf_etf_hist_price/_search" --
header "Content-Type: application/json" --data
$'{\
  "size":0,\
  "query":{\
    "bool":{\
      "must":{\
        "range":{\
          "date":{\
            "gte":"2018-12-26",\
            "lte":"2019-03-25"\
          }\
        },\
        "should":[\
          {\
            "term":{\
              "symbol":"efax"\
            }\
          },\
          {\
            "term":{\
              "symbol":"esgd"\
            }\
          },\
          {\
            "term":{\
              "symbol":"hdmv"\
            }\
          },\
          {\
            "term":{\
              "symbol":"idmo"\
            }\
          },\
          {\
            "term":{\
              "symbol":"ipkw"\
            }\
          },\
          {\
            "term":{\
              "symbol":"iqlt"\
            }\
          },\
          {\
            "term":{\
              "symbol":"qefa"\
            }\
          },\
          {\
            "term":{\
              "symbol":"rdfi"\
            }\
          },\
          {\
            "term":{\
              "symbol":"spdw"\
            }\
          }\
        ],\
        "minimum_should_match":1\
      }\
    },\
    "aggs":{\
      "daily_momentum":{\
        "date_histogram":{\
          "field":"date",\
          "interval":"1d",\
          "format":"yyyy-MM-dd",\
          "min_doc_count":1\
        },\
        "aggs":{\
          "cv":{\
            "scripted_metric":{\
              "init_script":

```

```
\\"state.totals=[]\\", \\"map_script\\":  
\\"state.totals.add(doc.change.value*doc.volume.value)\\", \\"combine_script\\": \\"double  
total=0, total_count=0; for (t in state.totals) {total += t; total_count += 1} return  
total/total_count\\", \\"reduce_script\\": \\"return states[0]\\"}"}"}"}"}'
```

Example Request - cf_etf_hist_price_Foreign Large Blend_changes_weekly

POST http://localhost:9200/cf_etf_hist_price/_search

HEADERS

Content-Type

application/json

BODY

```
{  
  "size": 0,  
  "query": {  
    "bool": {  
      "must": { "range": { "date": { "gte": "2018-12-26", "lte": "2019-03-  
25" } } },  
      "should": [  
        { "term": { "symbol": "efax" } },  
        { "term": { "symbol": "esgd" } },  
        { "term": { "symbol": "hdmv" } },  
        { "term": { "symbol": "idmo" } },  
        { "term": { "symbol": "ipkw" } },  
        { "term": { "symbol": "iqlt" } },  
        { "term": { "symbol": "qefa" } },  
        { "term": { "symbol": "rdfi" } },  
        { "term": { "symbol": "spdw" } }  
      ],  
      "minimum_should_match": 1  
    }  
  },  
  "aggs" : {  
    "weekly_momentum" : {  
      "date_histogram" : {  
        "field" : "date",  
        "interval" : "1w",  
        "format" : "yyyy-MM-dd",  
        "min_doc_count": 1  
      },  
      "aggs": {
```

```

        "cv" : {
            "scripted_metric":{
                "init_script": "state.totals=[]",
                "map_script":
"state.totals.add(doc.change.value*doc.volume.value)",
                "combine_script": "double total=0,
total_count=0; for (t in state.totals) {total += t; total_count += 1} return
total/total_count",
                "reduce_script": "return states[0]"
            }
        }
    }
}
}
}

```

```

curl --location --request POST "http://localhost:9200/cf_etf_hist_price/_search" --
header "Content-Type: application/json" --data '{"size": 0,
"query":{"bool":{"must":{"range":{"date":{"gte":"2018-12-26",
"lte":"2019-03-25"}}}, "should": [ {"term":{"symbol":"efax"}}, {"term":
{"symbol":"esgd"}}, {"term":{"symbol":"hdmv"}}, {"term":
{"symbol":"idmo"}}, {"term":{"symbol":"ipkw"}}, {"term":
{"symbol":"iqlt"}}, {"term":{"symbol":"qefa"}}, {"term":
{"symbol":"rdfi"}}, {"term":{"symbol":"spdw"}} ],
"minimum_should_match":1 } }, "aggs" : { "weekly_momentum" :
{ "date_histogram" : { "field" : "date", "interval" : "1w", "format" :
"yyyy-MM-dd", "min_doc_count": 1 }, "aggs": { "cv" :
{ "scripted_metric":{"init_script": "state.totals=[]", "map_script":
"state.totals.add(doc.change.value*doc.volume.value)", "combine_script": "double
total=0, total_count=0; for (t in state.totals) {total += t; total_count += 1} return
total/total_count", "reduce_script": "return states[0]"}}}}}}'

```

Example Request - cf_etf_China Region ETFs

POST http://localhost:9200/cf_etf/_search

HEADERS

Content-Type
application/json

BODY

```
{
```

```

    "size": 0,
    "query": {"match": {"morningstar_category": "China Region"}},
    "aggs" : {
        "DEM ETFs": {
            "terms": {"field": "symbol"}
        }
    }
}

```

```

curl --location --request POST "http://localhost:9200/cf_etf/_search" --header
"Content-Type: application/json" --data '{"size": 0, "query": {"match":
{"morningstar_category": "China Region"}}, "aggs": { "DEM ETFs": { "terms":
{"field": "symbol"}}}}'

```

Example Request - cf_etf_hist_prirce_China Region_changes_daily

POST http://localhost:9200/cf_etf_hist_price/_search

HEADERS

Content-Type
application/json

BODY

```

{
    "size": 0,
    "query": {
        "bool": {
            "must": {"range": {"date": {"gte": "2018-12-26", "lte": "2019-03-25"}}},
            "should": [
                {"term": {"symbol": "cnya"}},
                {"term": {"symbol": "cxse"}},
                {"term": {"symbol": "ecns"}},
                {"term": {"symbol": "ewh"}},
                {"term": {"symbol": "ewt"}},
                {"term": {"symbol": "gxc"}},
                {"term": {"symbol": "mchi"}},
                {"term": {"symbol": "wchn"}}
            ],
            "minimum_should_match": 1
        }
    },
}

```

```

    "aggs" : {
      "daily_momentum" : {
        "date_histogram" : {
          "field" : "date",
          "interval" : "1d",
          "format" : "yyyy-MM-dd",
          "min_doc_count": 1
        },
        "aggs": {
          "cv" : {
            "scripted_metric":{
              "init_script": "state.totals=[]",
              "map_script":
"state.totals.add(doc.change.value*doc.volume.value)",
              "combine_script": "double total=0,
total_count=0; for (t in state.totals) {total += t; total_count += 1} return
total/total_count",
              "reduce_script": "return states[0]"
            }
          }
        }
      }
    }
  }
}

```

```

curl --location --request POST "http://localhost:9200/cf_etf_hist_price/_search" --
header "Content-Type: application/json" --data $'\{"size": 0,
\ "query":{ \ "bool":{ \ "must": { \ "range":{ \ "date":{ \ "gte":\ "2018-12-26",
\ "lte":\ "2019-03-25" } } }, \ "should": [ { \ "term": { \ "symbol":\ "cnyd" } }, { \ "term":
{ \ "symbol":\ "cxse" } }, { \ "term": { \ "symbol":\ "ecns" } }, { \ "term":
{ \ "symbol":\ "ewh" } }, { \ "term": { \ "symbol":\ "ewt" } }, { \ "term":
{ \ "symbol":\ "gxc" } }, { \ "term": { \ "symbol":\ "mchi" } }, { \ "term":
{ \ "symbol":\ "wchn" } } ], \ "minimum_should_match":1 } }, \ "aggs" :
{ \ "daily_momentum" : { \ "date_histogram" : { \ "field" : \ "date", \ "interval" :
\ "1d", \ "format" : \ "yyyy-MM-dd", \ "min_doc_count": 1 }, \ "aggs": { \ "cv" :
{ \ "scripted_metric":{ \ "init_script": \ "state.totals=[]", \ "map_script":
\ "state.totals.add(doc.change.value*doc.volume.value)", \ "combine_script": \ "double
total=0, total_count=0; for (t in state.totals) {total += t; total_count += 1} return
total/total_count", \ "reduce_script": \ "return states[0]" } } } } } }'

```

Example Request - cf_etf_hist_price_China Region_changes_weekly

POST http://localhost:9200/cf_etf_hist_price/_search

HEADERS

Content-Type

application/json

BODY

```
{
  "size": 0,
  "query": {
    "bool": {
      "must": { "range": { "date": { "gte": "2018-12-26", "lte": "2019-03-25" } } },
      "should": [
        { "term": { "symbol": "cnya" } },
        { "term": { "symbol": "cxse" } },
        { "term": { "symbol": "ecns" } },
        { "term": { "symbol": "ewh" } },
        { "term": { "symbol": "ewt" } },
        { "term": { "symbol": "gxc" } },
        { "term": { "symbol": "mchi" } },
        { "term": { "symbol": "wchn" } }
      ],
      "minimum_should_match": 1
    }
  },
  "aggs": {
    "weekly_momentum": {
      "date_histogram": {
        "field": "date",
        "interval": "1w",
        "format": "yyyy-MM-dd",
        "min_doc_count": 1
      },
      "aggs": {
        "cv": {
          "scripted_metric": {
            "init_script": "state.totals=[]",
            "map_script": "state.totals.add(doc.change.value*doc.volume.value)",
            "combine_script": "double total=0, total_count=0; for (t in state.totals) {total += t; total_count += 1} return total/total_count",
            "reduce_script": "return states[0]"
          }
        }
      }
    }
  }
}
```

```

    }
  }
}

```

```

curl --location --request POST "http://localhost:9200/cf_etf_hist_price/_search" --
header "Content-Type: application/json" --data '${\ "size\": 0,
\ "query\":{ \ "bool\":{ \ "must\": { \ "range\":{ \ "date\":{ \ "gte\":\ "2018-12-26\ ",
\ "lte\":\ "2019-03-25\ "}}} }, \ "should\": [ { \ "term\": { \ "symbol\":\ "cnya\ "}}, { \ "term\":
{ \ "symbol\":\ "cxse\ "}}, { \ "term\": { \ "symbol\":\ "ecns\ "}}, { \ "term\":
{ \ "symbol\":\ "ewh\ "}}, { \ "term\": { \ "symbol\":\ "ewt\ "}}, { \ "term\":
{ \ "symbol\":\ "gxc\ "}}, { \ "term\": { \ "symbol\":\ "mchi\ "}}, { \ "term\":
{ \ "symbol\":\ "wchn\ "}} ], \ "minimum_should_match\":1 } }, \ "aggs\": :
{ \ "weekly_momentum\": { \ "date_histogram\": { \ "field\": \ "date\ ", \ "interval\":
\ "1w\ ", \ "format\": \ "yyyy-MM-dd\ ", \ "min_doc_count\": 1 }, \ "aggs\": { \ "cv\": :
{ \ "scripted_metric\":{ \ "init_script\": \ "state.totals={}\ ", \ "map_script\":
\ "state.totals.add(doc.change.value*doc.volume.value)\ ", \ "combine_script\": \ "double
total=0, total_count=0; for (t in state.totals) {total += t; total_count += 1} return
total/total_count\ ", \ "reduce_script\": \ "return states[0]\ " } } } } } }'

```

Example Request - cf_etf_High Yield Bond ETFs

POST http://localhost:9200/cf_etf/_search

HEADERS

Content-Type
application/json

BODY

```

{
  "size": 0,
  "query": { "match": { "morningstar_category": "High Yield Bond" } },
  "aggs" : {
    "DEM ETFs": {
      "terms": { "field": "symbol" }
    }
  }
}

```

```

curl --location --request POST "http://localhost:9200/cf_etf/_search" --header
"Content-Type: application/json" --data '${\ "size\": 0, \ "query\":{ \ "match\":

```

```
{\"morningstar_category\": \"High Yield Bond\"}}, \"aggs\" : { \"DEM ETFs\":  
{ \"terms\": {\"field\": \"symbol\"}}}}'
```

Example Request - cf_etf_hist_price_High Yield Bond_changes_daily

POST http://localhost:9200/cf_etf_hist_price/_search

HEADERS

Content-Type

application/json

BODY

```
{  
  "size": 0,  
  "query": {  
    "bool": {  
      "must": { "range": { "date": { "gte": "2018-12-26", "lte": "2019-03-  
25" } } },  
      "should": [  
        { "term": { "symbol": "faln" } },  
        { "term": { "symbol": "hyls" } },  
        { "term": { "symbol": "jphy" } },  
        { "term": { "symbol": "sfhy" } },  
        { "term": { "symbol": "shyg" } },  
        { "term": { "symbol": "sjnk" } },  
        { "term": { "symbol": "ushy" } },  
        { "term": { "symbol": "wfhy" } },  
      ],  
      "minimum_should_match": 1  
    }  
  },  
  "aggs": {  
    "daily_momentum": {  
      "date_histogram": {  
        "field": "date",  
        "interval": "1d",  
        "format": "yyyy-MM-dd",  
        "min_doc_count": 1  
      },  
      "aggs": {  
        "cv": {  
          "scripted_metric": {  
            "init_script": "state.total=0",  
            "script": "state.total += doc['daily_momentum']",  
            "finalize_script": "return state.total",  
            "type": "number"  
          }  
        }  
      }  
    }  
  }  
}
```



```

        "must": {"range":{"date":{"gte":"2018-12-26", "lte":"2019-03-
25"}}}},
        "should": [
            {"term": {"symbol":"faln"}},
            {"term": {"symbol":"hyls"}},
            {"term": {"symbol":"jphy"}},
            {"term": {"symbol":"sfhy"}},
            {"term": {"symbol":"shyg"}},
            {"term": {"symbol":"sjnk"}},
            {"term": {"symbol":"ushy"}},
            {"term": {"symbol":"wfhy"}}
        ],
        "minimum_should_match":1
    }
},
"aggs" : {
    "weekly_momentum" : {
        "date_histogram" : {
            "field" : "date",
            "interval" : "1w",
            "format" : "yyyy-MM-dd",
            "min_doc_count": 1
        },
        "aggs": {
            "cv" : {
                "scripted_metric":{
                    "init_script": "state.totals=[]",
                    "map_script":
"state.totals.add(doc.change.value*doc.volume.value)",
                    "combine_script": "double total=0,
total_count=0; for (t in state.totals) {total += t; total_count += 1} return
total/total_count",
                    "reduce_script": "return states[0]"
                }
            }
        }
    }
}
}
}
}

```

```

curl --location --request POST "http://localhost:9200/cf_etf_hist_price/_search" --
header "Content-Type: application/json" --data '{"size": 0,
"query":{"bool":{"must":{"range":{"date":{"gte":"2018-12-26",
"lte":"2019-03-25"}}}, "should": [ {"term": {"symbol":"faln"}}, {"term":
{"symbol":"hyls"}}, {"term": {"symbol":"jphy"}}, {"term":

```

```
{\"symbol\\\": \"sfhy\\\"}, {\"term\\\": {\"symbol\\\": \"shyg\\\"}, {\"term\\\": {\"symbol\\\": \"sjnk\\\"}, {\"term\\\": {\"symbol\\\": \"ushy\\\"}, {\"term\\\": {\"symbol\\\": \"wfhy\\\"} } ], \"minimum_should_match\\\": 1 } }, \"aggs\\\" : { \"weekly_momentum\\\" : { \"date_histogram\\\" : { \"field\\\" : \"date\\\", \"interval\\\" : \"1w\\\", \"format\\\" : \"yyyy-MM-dd\\\", \"min_doc_count\\\": 1 }, \"aggs\\\": { \"cv\\\" : { \"scripted_metric\\\": { \"init_script\\\": \"state.totals={}\\\", \"map_script\\\": \"state.totals.add(doc.change.value*doc.volume.value)\\\", \"combine_script\\\": \"double total=0, total_count=0; for (t in state.totals) {total += t; total_count += 1} return total/total_count\\\", \"reduce_script\\\": \"return states[0]\\\"}}}}}}'
```

Example Request - cf_etf_Ultrashort Bond ETFs

POST http://localhost:9200/cf_etf/_search

HEADERS

Content-Type
application/json

BODY

```
{
  "size": 0,
  "query": { "match": { "morningstar_category": "Ultrashort Bond" } },
  "aggs" : {
    "DEM ETFs": {
      "terms": { "field": "symbol" }
    }
  }
}
```

```
curl --location --request POST "http://localhost:9200/cf_etf/_search" --header
"Content-Type: application/json" --data '${\"size\\\": 0, \"query\\\": {\"match\\\": {\"morningstar_category\\\": \"Ultrashort Bond\\\"}}, \"aggs\\\" : { \"DEM ETFs\\\": { \"terms\\\": { \"field\\\": \"symbol\\\"}}}}'
```

Example Request - cf_etf_hist_prirce_Ultrashort Bond_changes_daily

POST http://localhost:9200/cf_etf_hist_price/_search

HEADERS

Content-Type
application/json

BODY

```
{
  "size": 0,
  "query": {
    "bool": {
      "must": { "range": { "date": { "gte": "2018-12-26", "lte": "2019-03-25" } } },
      "should": [
        { "term": { "symbol": "bil" } },
        { "term": { "symbol": "flot" } },
        { "term": { "symbol": "flrn" } },
        { "term": { "symbol": "ftsm" } },
        { "term": { "symbol": "jpst" } },
        { "term": { "symbol": "near" } },
        { "term": { "symbol": "ulst" } },
        { "term": { "symbol": "vrig" } }
      ],
      "minimum_should_match": 1
    }
  },
  "aggs" : {
    "daily_momentum" : {
      "date_histogram" : {
        "field" : "date",
        "interval" : "1d",
        "format" : "yyyy-MM-dd",
        "min_doc_count": 1
      },
      "aggs": {
        "cv" : {
          "scripted_metric": {
            "init_script": "state.totals=[]",
            "map_script":
"state.totals.add(doc.change.value*doc.volume.value)",
            "combine_script": "double total=0,
total_count=0; for (t in state.totals) {total += t; total_count += 1} return
total/total_count",
            "reduce_script": "return states[0]"
          }
        }
      }
    }
  }
}
```

```
}
```

```
curl --location --request POST "http://localhost:9200/cf_etf_hist_price/_search" --
header "Content-Type: application/json" --data '${\"size\": 0,
\"query\":{ \"bool\":{ \"must\": {\"range\":{\"date\":{\"gte\": \"2018-12-26\",
\"lte\": \"2019-03-25\"}}}, \"should\": [ {\"term\": {\"symbol\": \"bil\"}}, {\"term\":
{\"symbol\": \"flot\"}}, {\"term\": {\"symbol\": \"flrn\"}}, {\"term\":
{\"symbol\": \"ftsm\"}}, {\"term\": {\"symbol\": \"jpst\"}}, {\"term\":
{\"symbol\": \"near\"}}, {\"term\": {\"symbol\": \"ulst\"}}, {\"term\":
{\"symbol\": \"vrig\"}} ], \"minimum_should_match\":1 } }, \"aggs\" :
{ \"daily_momentum\" : { \"date_histogram\" : { \"field\" : \"date\", \"interval\" :
\"1d\", \"format\" : \"yyyy-MM-dd\", \"min_doc_count\": 1 }, \"aggs\": { \"cv\" :
{ \"scripted_metric\":{ \"init_script\": \"state.totals={}\", \"map_script\":
\"state.totals.add(doc.change.value*doc.volume.value)\", \"combine_script\": \"double
total=0, total_count=0; for (t in state.totals) {total += t; total_count += 1} return
total/total_count\", \"reduce_script\": \"return states[0]\"}}}}}'
```

Example Request - cf_etf_hist_price_Ultrashort Bond_changes_weekly

POST http://localhost:9200/cf_etf_hist_price/_search

HEADERS

Content-Type

application/json

BODY

```
{
  "size": 0,
  "query":{
    "bool":{
      "must": { "range":{ "date":{ "gte": "2018-12-26", "lte": "2019-03-
25" } } },
      "should": [
        { "term": { "symbol": "bil" } },
        { "term": { "symbol": "flot" } },
        { "term": { "symbol": "flrn" } },
        { "term": { "symbol": "ftsm" } },
        { "term": { "symbol": "jpst" } },
        { "term": { "symbol": "near" } },
        { "term": { "symbol": "ulst" } },
        { "term": { "symbol": "vrig" } }
      ],
    }
  },
}
```

```

        "minimum_should_match":1
    }
},
"aggs" : {
    "weekly_momentum" : {
        "date_histogram" : {
            "field" : "date",
            "interval" : "1w",
            "format" : "yyyy-MM-dd",
            "min_doc_count": 1
        },
        "aggs": {
            "cv" : {
                "scripted_metric":{
                    "init_script": "state.totals=[]",
                    "map_script":
"state.totals.add(doc.change.value*doc.volume.value)",
                    "combine_script": "double total=0,
total_count=0; for (t in state.totals) {total += t; total_count += 1} return
total/total_count",
                    "reduce_script": "return states[0]"
                }
            }
        }
    }
}
}
}

```

```

curl --location --request POST "http://localhost:9200/cf_etf_hist_price/_search" --
header "Content-Type: application/json" --data '{"size": 0,
"query":{"bool":{"must":{"range":{"date":{"gte":"2018-12-26",
"lte":"2019-03-25"}}}, "should": [ {"term":{"symbol":"bil"}}, {"term":
{"symbol":"flot"}}, {"term":{"symbol":"flrn"}}, {"term":
{"symbol":"ftsm"}}, {"term":{"symbol":"jpst"}}, {"term":
{"symbol":"near"}}, {"term":{"symbol":"ulst"}}, {"term":
{"symbol":"vrig"}} ], "minimum_should_match":1 } }, "aggs" :
{ "weekly_momentum" : { "date_histogram" : { "field" : "date", "interval" :
"1w", "format" : "yyyy-MM-dd", "min_doc_count": 1 }, "aggs": { "cv" :
{ "scripted_metric":{"init_script": "state.totals=[]", "map_script":
"state.totals.add(doc.change.value*doc.volume.value)", "combine_script": "double
total=0, total_count=0; for (t in state.totals) {total += t; total_count += 1} return
total/total_count", "reduce_script": "return states[0]"}}}}}}'

```

Example Request - cf_etf_Allocation--30% to 50% Equity ETFs

POST http://localhost:9200/cf_etf/_search

HEADERS

Content-Type
application/json

BODY

```
{
  "size": 0,
  "query": {"match": {"morningstar_category": "Allocation--30% to 50% Equity"}},
  "aggs" : {
    "DEM ETFs": {
      "terms": {"field": "symbol"}
    }
  }
}
```

```
curl --location --request POST "http://localhost:9200/cf_etf/_search" --header
"Content-Type: application/json" --data '${"size": 0, "query":{"match":
{"morningstar_category":"Allocation--30% to 50% Equity"}}, "aggs":
{ "DEM ETFs": { "terms": {"field":"symbol"}}}}'
```

Example Request - cf_etf_hist_price_Allocation--30% to 50% Equity changes daily

POST http://localhost:9200/cf_etf_hist_price/_search

HEADERS

Content-Type
application/json

BODY

```
{
  "size": 0,
  "query": {
    "bool": {
      "must": { "range": { "date": { "gte": "2018-12-26", "lte": "2019-03-25" } } },
      "should": [
```

```

        {"term": {"symbol": "aok"}},
        {"term": {"symbol": "aom"}},
        {"term": {"symbol": "dwin"}},
        {"term": {"symbol": "iyld"}},
        {"term": {"symbol": "pcef"}},
        {"term": {"symbol": "psmc"}},
        {"term": {"symbol": "psmm"}}
    ],
    "minimum_should_match": 1
  }
},
"aggs" : {
  "daily_momentum" : {
    "date_histogram" : {
      "field" : "date",
      "interval" : "1d",
      "format" : "yyyy-MM-dd",
      "min_doc_count": 1
    },
    "aggs": {
      "cv" : {
        "scripted_metric": {
          "init_script": "state.totals=[]",
          "map_script":
"state.totals.add(doc.change.value*doc.volume.value)",
          "combine_script": "double total=0,
total_count=0; for (t in state.totals) {total += t; total_count += 1} return
total/total_count",
          "reduce_script": "return states[0]"
        }
      }
    }
  }
}
}
}

```

```

curl --location --request POST "http://localhost:9200/cf_etf_hist_price/_search" --
header "Content-Type: application/json" --data '{"size": 0,
"query": { "bool": { "must": { "range": { "date": { "gte": "2018-12-26",
"lte": "2019-03-25" } } }, "should": [ { "term": { "symbol": "aok" } }, { "term":
{ "symbol": "aom" } }, { "term": { "symbol": "dwin" } }, { "term":
{ "symbol": "iyld" } }, { "term": { "symbol": "pcef" } }, { "term":
{ "symbol": "psmc" } }, { "term": { "symbol": "psmm" } } ] },
"minimum_should_match": 1 } }, "aggs" : { "daily_momentum" :
{ "date_histogram" : { "field" : "date", "interval" : "1d", "format" :

```



```
\\"yyyy-MM-dd\\", \\"min_doc_count\\": 1 }, \\"aggs\\": { \\"cv\\" :
{ \\"scripted_metric\\":{ \\"init_script\\": \\"state.totals=[]\\", \\"map_script\\":
\\"state.totals.add(doc.change.value*doc.volume.value)\\", \\"combine_script\\": \\"double
total=0, total_count=0; for (t in state.totals) {total += t; total_count += 1} return
total/total_count\\", \\"reduce_script\\": \\"return states[0]\\"}}}}}}'
```

Example Request - cf_etf_hist_price_Allocation--30% to 50% Equity_changes_weekly

POST http://localhost:9200/cf_etf_hist_price/_search

HEADERS

Content-Type

application/json

BODY

```
{
  "size": 0,
  "query":{
    "bool":{
      "must": { "range":{ "date":{ "gte": "2018-12-26", "lte": "2019-03-
25" } } },
      "should": [
        { "term": { "symbol": "aok" } },
        { "term": { "symbol": "aom" } },
        { "term": { "symbol": "dwin" } },
        { "term": { "symbol": "iyl" } },
        { "term": { "symbol": "pcef" } },
        { "term": { "symbol": "psmc" } },
        { "term": { "symbol": "psmm" } }
      ],
      "minimum_should_match": 1
    }
  },
  "aggs" : {
    "weekly_momentum" : {
      "date_histogram" : {
        "field" : "date",
        "interval" : "1w",
        "format" : "yyyy-MM-dd",
        "min_doc_count": 1
      },
      "aggs": {
        "cv" : {
          "scripted_metric":{
```

```

        "init_script": "state.totals=[]",
        "map_script":
"state.totals.add(doc.change.value*doc.volume.value)",
        "combine_script": "double total=0,
total_count=0; for (t in state.totals) {total += t; total_count += 1} return
total/total_count",
        "reduce_script": "return states[0]"
    }
}
}
}
}

```

```
curl --location --request POST "http://localhost:9200/cf_etf_hist_price/_search" --header "Content-Type: application/json" --data '{"size": 0, "query": { "bool": { "must": { "range": { "date": { "gte": "2018-12-26", "lte": "2019-03-25" } } }, "should": [ { "term": { "symbol": "aok" } }, { "term": { "symbol": "aom" } }, { "term": { "symbol": "dwin" } }, { "term": { "symbol": "iyld" } }, { "term": { "symbol": "pcef" } }, { "term": { "symbol": "psmc" } }, { "term": { "symbol": "psmm" } } ] }, "minimum_should_match": 1 } }, "aggs": { "weekly_momentum": { "date_histogram": { "field": "date", "interval": "1w", "format": "yyyy-MM-dd", "min_doc_count": 1 }, "aggs": { "cv": { "scripted_metric": { "init_script": "state.totals=[]", "map_script": "state.totals.add(doc.change.value*doc.volume.value)", "combine_script": "double total=0, total_count=0; for (t in state.totals) {total += t; total_count += 1} return total/total_count", "reduce_script": "return states[0]" } } } } }
```

Example Request - cf_etf_hist_prirce_Bollinger_band_dem

POST http://localhost:9200/cf_etf_hist_price/_search

HEADERS

Content-Type

application/json

BODY

```
{
    "size": 0,
    "query": {
```

```

    "bool":{
      "must": [
        {"range":{"date":{"gte":"2018-12-26", "lte":"2019-03-25"}}},
        {"term": {"symbol":"rfem"}}
      ]
    },
    "aggs" : {
      "Bollinger_band" : {
        "date_histogram" : {
          "field" : "date",
          "interval" : "1d",
          "format" : "yyyy-MM-dd",
          "min_doc_count": 1
        },
        "aggs": {
          "tp" : {
            "scripted_metric":{
              "init_script": "state.totals=[]",
              "map_script":
"state.totals.add((doc.high.value+doc.low.value+doc.close.value)/3)",
              "combine_script": "double total=0; for (t in
state.totals) {total += t} return total",
              "reduce_script": "return states[0]"
            }
          },
          "20_trading_days_moving_avg": {
            "moving_avg" : {"model": "simple", "window":20,
"buckets_path":"tp.value"}
          },
          "20_trading_days_stdDev": {
            "moving_fn": {"script":"MovingFunctions.stdDev(values,
MovingFunctions.unweightedAvg(values))", "window":20, "buckets_path":"tp.value"}
          },
          "BBU": {
            "bucket_script": {
              "buckets_path": {
                "SMA": "20_trading_days_moving_avg",
                "StdDev": "20_trading_days_stdDev"
              },
              "script": "params.SMA + 2 * params.StdDev"
            }
          },
          "BBL": {
            "bucket_script": {
              "buckets_path": {
                "SMA": "20 trading days moving avg",

```

```
        "StdDev": "20_trading_days_stdDev"  
    },  
    "script": "params.SMA - 2 * params.StdDev"  
}  
  
}  
  
}
```

```
curl --location --request POST "http://localhost:9200/cf_etf_hist_price/_search" --header "Content-Type: application/json" --data '{"size":0,"query":{"bool":{"must":[{"range":{"date":{"gte":"2018-12-26","lte":"2019-03-25"}}},{ "term":{"symbol":"rfem"}}]}},'aggs":{"Bollinger_band":{"date_histogram":{"field":"date","interval":"1d","format":"yyyy-MM-dd","min_doc_count":1},"aggs":{"tp":{"scripted_metric":{"init_script":"state.totals=[]","map_script":"state.totals.add((doc.high.value+doc.low.value+doc.close.value)/3)","combine_script":"double total=0; for (t in state.totals) {total += t} return total","reduce_script":"return states[0]"}},'20_trading_days_moving_avg":{"moving_avg":{"model":"simple","window":20,"buckets_path":"tp.value"}},'20_trading_days_stdDev":{"moving_fn":{"script":"MovingFunctions.stdDev(values,MovingFunctions.unweightedAvg(values))","window":20,"buckets_path":"tp.value"}},'BBU":{"bucket_script":{"buckets_path":{"SMA":"20_trading_days_moving_avg","StdDev":"20_trading_days_stdDev"},"script":"params.SMA + 2 * params.StdDev"}},'BBL":{"bucket_script":{"buckets_path":{"SMA":"20_trading_days_moving_avg","StdDev":"20_trading_days_stdDev"},"script":"params.SMA - 2 * params.StdDev"}}}}}}}'
```