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_prirce_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":"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" : {
         "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\":\"emdv\"}},{\"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\":{\"day_momentum\":{
\"date_histogram\":{\"field\":\"date\",\"interval\":\"1d\",\"format\":\"yyyy-MM-
dd\",\"min_doc_count\":1},\"aggs\":{\"cv\":{\"scripted_metric\":{\"init_script\":\"sta
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_prirce_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\":\"emdv\"}},{\"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\":{\"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\":\"emdv\"}},{\"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_prirce_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"}},
```

```
                                {"term": {"symbol":"sye"}},
                                {"term": {"symbol":"ulvm"}},
                                {"term": {"symbol":"usmf"}}
                    ],
                    "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\":\"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\":
{\"daily_momentum\":{\"date_histogram\":{\"field\":\"date\",\"interval\":\"1d\",\"form
at\":\"yyyy-MM-
dd\",\"min_doc_count\":1},\"aggs\":{\"cv\":{\"scripted_metric\":{\"init_script\":\"sta
```

```
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_prirce_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\",\"for
mat\":\"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_prirce_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\":{\"d
ate_histogram\":{\"field\":\"date\",\"interval\":\"1d\",\"format\":\"yyyy-MM-
dd\",\"min_doc_count\":1},\"aggs\":{\"cv\":{\"scripted_metric\":{\"init_script\":\"sta
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_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\":\"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]\" }}}}}}'
```

Example Request - cf_etf_Europe Stock_ETFs

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

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\"}},{\"term\":
```

```
{\"symbol\":\"hedj\"}},{\"term\":{\"symbol\":\"hezu\"}},{\"term\":{\"symbol\":\"ieur\"
}},{\"term\":{\"symbol\":\"smez\"}}],\"minimum_should_match\":1}},\"aggs\":{\"daily_mo
mentum\":{\"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_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

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\"}},\"aggs\"
:{\"DEM_ETFs\":{\"terms\":{\"field\":\"symbol\",\"size\":11}}}}'
```

Example Request - cf_etf_hist_prirce_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\"}}],\"minimum_should_match\":1}},\"aggs\":{\"daily_mom
entum\":{\"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_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_prirce_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_prirce_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\":\"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]\"}}}}}}'
```

Example Request - cf_etf_hist_prirce_China Region_changes_weekly

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

HEADERS

Content-Type

application/json

BODY

```json
{
        "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_prirce_High Yield Bond_changes_daily

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.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\" :
{ \"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_High Yield 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":"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_prirce_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

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_prirce_Allocation--30% to 50% Equity_changes_daily

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_prirce_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":"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]"
                                        }
                                }
                        }
                }
        }
}
```

```
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_rfem

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":{"fiel
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CHAPTER10