

Chapter 8 – Aggregation Framework

Example Request - IEX_ACWF_chart_3m

GET IEX_ACWF_chart_3m

https://cloud.iexapis.com/v1/stock/ACWF/chart/3m?token=pk_d68567ab0eac47059c4415f485f45106

```
curl --location --request GET "https://cloud.iexapis.com/v1/stock/ACWF/chart/3m?token=pk_d68567ab0eac47059c4415f485f45106"
```

Example Request - cf_etf_historical_prices_mapping

GET http://localhost:9200/cf_etf_hist_price/

```
curl --location --request GET "http://localhost:9200/cf_etf_hist_price/"
```

Example Request - cf_etf_historical_prices document_count

GET http://localhost:9200/cf_etf_hist_price/_count

```
curl --location --request GET "http://localhost:9200/cf_etf_hist_price/_count"
```

Example Request - cf_etf_hist_price_document_search_all

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

HEADERS

Content-Type
application/json

BODY

```
{
  "size": 61,
  "query": { "match": { "symbol": "ACWF" } }
}
```

```
curl --location --request POST "http://localhost:9200/cf_etf_hist_price/_search" --header "Content-Type: application/json" --data '${ "size": 61, "query": { "match": { "symbol": "ACWF" } } }'
```

Example Request - cf_etf_hist_price_matrix_stats

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

HEADERS

Content-Type
application/json

accept
application/json

BODY

```
{  "size": 0,
    "query": { "match": { "symbol": "ACWF"}},
    "aggs": {
      "statistics": {
        "matrix_stats": {
          "fields": ["volume", "changePercent"]
        }
      }
    }
  }
```

```
curl --location --request POST "http://localhost:9200/cf_etf_hist_price/_search" --header "Content-Type: application/json" --header "accept: application/json" --data '${"size": 0, "query": { "match": { "symbol": "ACWF"}}, "aggs": { "statistics": { "matrix_stats": { "fields": ["volume", "changePercent"] } } } }'
```

Example Request - count_cf_etf_hist_price_index_document

GET http://localhost:9200/cf_etf_hist_price/_count

```
curl --location --request GET "http://localhost:9200/cf_etf_hist_price/_count"
```

Example Request - delete_cf_etf_hist_price_index

DEL http://localhost:9200/cf_etf_hist_price/

```
curl --location --request DELETE "http://localhost:9200/cf_etf_hist_price/"
```

Example Request - cf_etf_hist_price_avg_acwf_change

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

HEADERS

Content-Type
application/json
Accept
application/json

BODY

```
{  "size": 0,
    "query": { "match": { "symbol": "ACWF"}},
    "aggs": { "acwf_avg_change_price": { "avg": { "field": "change" } } }
  }
```

```
curl --location --request POST "http://localhost:9200/cf_etf_hist_price/_search" --header "Content-Type: application/json" --header "Accept: application/json" --data
```

```
$('#{"size":0,"query":{"match":{"symbol":"ACWF"}},\n"aggs":{"acwf_avg_change_price":{"avg":{"field":"change"}}}}')
```

Example Request - cf_etf_hist_price_weight_avg_acwf_change

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

HEADERS

Content-Type
application/json
accept
application/json

BODY

```
{
  "size": 0,
  "query": { "match": { "symbol": "ACWF"}},
  "aggs": {
    "acwf_avg_change_with_vol_weight": {
      "weighted_avg": {
        "value": {"field": "change"}, "weight": {"field": "volume"}
      }
    }
  }
}
```

```
curl --location --request POST "http://localhost:9200/cf_etf_hist_price/_search" --header "Content-Type: application/json" --header "accept: application/json" --data $'{"size": 0, \n"query": { \n"match": { \n"symbol": \n"ACWF"}}, \n"aggs": { \n"acwf_avg_change_with_vol_weight": { \n"weighted_avg": { \n"value": { \n"field": \n"change"}, \n"weight": { \n"field": \n"volume"} } } } }'
```

Example Request - cf_etf_morningstar_categories_cardinality

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

HEADERS

Content-Type
application/json
accept
application/json

BODY

```
{
  "size": 0,
  "aggs": {
    "number_of_morningstar_category": {
      "cardinality": {"field": "morningstar_category"}
    }
  }
}
```

```
curl --location --request POST "http://localhost:9200/cf_etf/_search" --header "Content-Type: application/json" --header "accept: application/json" --data
```

```
$('#"size": 0, \\"aggs": { \\"number_of_morningstar_category": { \\"cardinality": { \\"field": \\"morningstar_category\\"} } } }'
```

Example Request - cf_etf_market_cap_value_count

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

HEADERS

Content-Type
application/json
accept
application/json

BODY

```
{
  "size": 0,
  "aggs": {
    "num_of_etfs_have_market_cap": {
      "value_count": {"field": "market_cap"}
    }
  }
}
```

```
curl --location --request POST "http://localhost:9200/cf_etf/_search" --header "Content-Type: application/json" --header "accept: application/json" --data $('#"size": 0, \\"aggs": { \\"num_of_etfs_have_market_cap": { \\"value_count": { \\"field": \\"market_cap\\"} } } }'
```

Example Request - cf_etf_dividend_acwf_amount_sum

POST http://localhost:9200/cf_etf_dividend_denormalize/_search

HEADERS

Content-Type
application/json

BODY

```
{
  "size": 0,
  "query": { "match": { "symbol": "ACWF"}},
  "aggs": {
    "sum_amount": {
      "sum": {"field": "amount"}
    }
  }
}
```

```
curl --location --request POST "http://localhost:9200/cf_etf_dividend_denormalize/_search" --header "Content-Type: application/json" --data $('#"size": 0, \\"query": { \\"match": { \\"symbol": \\"ACWF\\"}}, \\"aggs": { \\"sum_amount": { \\"sum": { \\"field": \\"amount\\"} } } }'
```

Example Request - cf_etf_hist_price_acwf_minimum_open_price

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

HEADERS

Content-Type
application/json
accept
application/json

BODY

```
{
  "size": 0,
  "query": { "match": { "symbol": "ACWF"}},
  "aggs": {
    "minimum_open_price": {
      "min": { "field": "open" }
    }
  }
}
```

```
curl --location --request POST "http://localhost:9200/cf_etf_hist_price/_search" --
header "Content-Type: application/json" --header "accept: application/json" --data
$'{\"size\": 0, \"query\": { \"match\": { \"symbol\": \"ACWF\"}}, \"aggs\":
{ \"minimum_open_price\": { \"min\": {\"field\": \"open\"} } } }'
```

Example Request - cf_etf_hist_price_acwf_maximum_open_price

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

HEADERS

Content-Type
application/json
accept
application/json

BODY

```
{
  "size": 0,
  "query": { "match": { "symbol": "ACWF"}},
  "aggs": {
    "maximum_open_price": {
      "max": { "field": "open" }
    }
  }
}
```

```
curl --location --request POST "http://localhost:9200/cf_etf_hist_price/_search" --
header "Content-Type: application/json" --header "accept: application/json" --data
$'{\"size\": 0, \"query\": { \"match\": { \"symbol\": \"ACWF\"}}, \"aggs\":
{ \"maximum_open_price\": { \"max\": {\"field\": \"open\"} } } }'
```

Example Request - cf_etf_hist_price_acwf_stats_open_price

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

HEADERS

Content-Type
application/json
accept
application/json

BODY

```
{
  "size": 0,
  "query": { "match": { "symbol": "ACWF"}},
  "aggs": {
    "stats_open_price": {
      "stats": { "field": "open" }
    }
  }
}
```

```
curl --location --request POST "http://localhost:9200/cf_etf_hist_price/_search" --
header "Content-Type: application/json" --header "accept: application/json" --data
$'{"size": 0, "query": { "match": { "symbol": "ACWF"}}, "aggs":
{ "stats_open_price": { "stats": { "field": "open" } } }'
```

Example Request - cf_etf_hist_price_acwf_extended_stats_open_price

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

HEADERS

Content-Type
application/json
accept
application/json

BODY

```
{
  "size": 0,
  "query": { "match": { "symbol": "ACWF"}},
  "aggs": {
    "extend_stats_open_price": {
      "extended_stats": { "field": "open" }
    }
  }
}
```

```
curl --location --request POST "http://localhost:9200/cf_etf_hist_price/_search" --
header "Content-Type: application/json" --header "accept: application/json" --data
$'{"size": 0, "query": { "match": { "symbol": "ACWF"}}, "aggs":
{ "extend_stats_open_price": { "extended_stats": { "field": "open" } } }'
```

Example Request - cf_etf_top_hit_morningstar_category

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

HEADERS

Content-Type
application/json
accept
application/json

BODY

```
{
  "size": 0,
  "aggs": {
    "category_top_hits": {
      "terms": {
        "field": "morningstar_category",
        "size": 5
      },
      "aggs": {
        "category_top_hits": {
          "top_hits": {}
        }
      }
    }
  }
}
```

```
curl --location --request POST "http://localhost:9200/cf_etf/_search" --header
"Content-Type: application/json" --header "accept: application/json" --data
$'{\"size\": 0, \"aggs\": { \"category_top_hits\": { \"terms\":
{ \"field\": \"morningstar_category\", \"size\": 5 }, \"aggs\": { \"category_top_hits\":
{ \"top_hits\": {} } } } } }
```

Example Request - cf_etf_hist_price_percentiles_open_price

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

HEADERS

Content-Type
application/json
accept
application/json

BODY

```
{
  "size": 0,
  "query": { "match": { "symbol": "ACWF"} },
  "aggs": {
    "open_price_percentiles": {
      "percentiles": { "field": "open" }
    }
  }
}
```

```
curl --location --request POST "http://localhost:9200/cf_etf_hist_price/_search" --header "Content-Type: application/json" --header "accept: application/json" --data $'{"size": 0, "query": { "match": { "symbol": "ACWF"}}, "aggs": { "open_price_percentiles": { "percentiles": { "field": "open" } } } }
```

Example Request - cf_etf_hist_price_percentile_rank_open_price

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

HEADERS

Content-Type
application/json
accept
application/json

BODY

```
{
  "size": 0,
  "query": { "match": { "symbol": "ACWF"}},
  "aggs": {
    "open_price_percentile_rank": {
      "percentile_ranks": { "field": "open", "values": 28.5 }
    }
  }
}
```

```
curl --location --request POST "http://localhost:9200/cf_etf_hist_price/_search" --header "Content-Type: application/json" --header "accept: application/json" --data $'{"size": 0, "query": { "match": { "symbol": "ACWF"}}, "aggs": { "open_price_percentile_rank": { "percentile_ranks": { "field": "open", "values": 28.5 } } } }
```

Example Request - cf_etf_hist_price_mad_acwf_percetChange

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

HEADERS

Content-Type
application/json
accept
application/json

BODY

```
{
  "size": 0,
  "query": { "match": { "symbol": "ACWF"}},
  "aggs": {
    "mad_change_percent": {
      "median_absolute_deviation": { "field": "changePercent" }
    }
  }
}
```



```
}
```

```
curl --location --request POST "http://localhost:9200/cf_etf_hist_price/_search" --header "Content-Type: application/json" --header "accept: application/json" --data '{"size":0,"query":{"match":{"symbol":"ACWF"}},"aggs":{"mad_change_percent":{"median_absolute_deviation":{"field":"changePercent"}}}}'
```

Example Request - cf_etf_hist_price_scripted_metric

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

HEADERS

Content-Type
application/json
accept
application/json

BODY

```
{
  "size": 0,
  "query": { "match": { "symbol": "ACWF"}},
  "aggs": {
    "highest_cp_cot_ratio": {
      "scripted_metric": {
        "init_script": "state.price_diff = new ArrayList()",
        "map_script": "double value = doc.changeOverTime.value==0 ? 0 : doc.changePercent.value/(doc.changeOverTime.value*100); state.price_diff.add(value)",
        "combine_script": "return Collections.max(state.price_diff)",
        "reduce_script": "return Collections.max(states)"
      }
    }
  }
}
```

```
curl --location --request POST "http://localhost:9200/cf_etf_hist_price/_search" --header "Content-Type: application/json" --header "accept: application/json" --data '{"size": 0, "query": { "match": { "symbol": "ACWF"}}, "aggs": { "highest_cp_cot_ratio": { "scripted_metric": { "init_script": "state.price_diff = new ArrayList()", "map_script": "double value = doc.changeOverTime.value==0 ? 0 : doc.changePercent.value/(doc.changeOverTime.value*100); state.price_diff.add(value)", "combine_script": "return Collections.max(state.price_diff)", "reduce_script": "return Collections.max(states)" } } } }'
```

Example Request - cf_etf_hist_price_acwf_histogram

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

HEADERS

Content-Type
application/json
accept

application/json

BODY

```
{
  "size": 0,
  "query": { "match": { "symbol": "ACWF"}},
  "aggs": {
    "acwf_histogram": {
      "histogram": {
        "field": "open",
        "interval": 1,
        "extended_bounds": { "min":24, "max":30}
      }
    }
  }
}
```

```
curl --location --request POST "http://localhost:9200/cf_etf_hist_price/_search" --
header "Content-Type: application/json" --header "accept: application/json" --data
$'{\"size\": 0, \"query\": { \"match\": { \"symbol\": \"ACWF\"}}, \"aggs\":
{ \"acwf_histogram\": { \"histogram\": { \"field\": \"open\", \"interval\": 1,
\"extended_bounds\": { \"min\":24, \"max\":30} } } }'}
```

Example Request - cf_etf_hist_price_acwf_date_histogram

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

HEADERS

Content-Type
application/json
accept
application/json

BODY

```
{
  "size": 0,
  "query": { "match": { "symbol": "ACWF"}},
  "aggs":{
    "monthly_trading_days": {
      "date_histogram":{
        "field": "date",
        "interval": "month",
        "format": "yyyy-MM-dd"
      }
    }
  }
}
```

```
curl --location --request POST "http://localhost:9200/cf_etf_hist_price/_search" --
header "Content-Type: application/json" --header "accept: application/json" --data
$'{\"size\": 0, \"query\": { \"match\": { \"symbol\": \"ACWF\"}},
\"aggs\":{ \"monthly_trading_days\": { \"date_histogram\":{ \"field\": \"date\",
\"interval\": \"month\", \"format\": \"yyyy-MM-dd\" } } }'}
```

Example Request - cf_etf_hist_price_acwf_auto_interval_date_histogram

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

HEADERS

Content-Type
application/json
accept
application/json

BODY

```
{
  "size": 0,
  "query": { "match": { "symbol": "ACWF"} },
  "aggs": {
    "monthly_trading_days": {
      "auto_date_histogram": {
        "field": "date",
        "buckets": "4",
        "format": "yyyy-MM-dd"
      }
    }
  }
}
```

```
curl --location --request POST "http://localhost:9200/cf_etf_hist_price/_search" --
header "Content-Type: application/json" --header "accept: application/json" --data
$'{\"size\": 0, \"query\": { \"match\": { \"symbol\": \"ACWF\"}},
\"aggs\":{ \"monthly_trading_days\": { \"auto_date_histogram\":{ \"field\": \"date\",
\"buckets\": \"4\", \"format\": \"yyyy-MM-dd\" } } } }'
```

Example Request - cf_etf_hist_price_acwf_ranges

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

HEADERS

Content-Type
application/json
accept
application/json

BODY

```
{
  "size": 0,
  "query": { "match": { "symbol": "ACWF"} },
  "aggs": {
    "monthly_trading_days": {
      "range": {
        "field": "date",
        "format": "yyyy-MM-dd",
        "ranges": [{"from": "2018-12-01"}, {"to": "2019-04-01"}, {"from": "2019-01-01"}, {"to": "2019-02-01"}]
      }
    }
  }
}
```

```
}  
}
```

```
curl --location --request POST "http://localhost:9200/cf_etf_hist_price/_search" --  
header "Content-Type: application/json" --header "accept: application/json" --data  
$'{\"size\": 0, \"query\": { \"match\": { \"symbol\": \"ACWF\"}},  
\"aggs\": { \"monthly_trading_days\": { \"range\": { \"field\": \"date\", \"format\":  
\"yyyy-MM-dd\", \"ranges\": [{ \"from\": \"2018-12-01\", \"to\": \"2019-04-  
01\"}, { \"from\": \"2019-01-01\", \"to\": \"2019-02-01\"} ] } } } }'
```

Example Request - cf_etf_hist_price_acwf_date_ranges

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

HEADERS

Content-Type
application/json
accept
application/json
BODY

```
{  
  "size": 0,  
  "query": { "match": { "symbol": "ACWF"} },  
  "aggs": {  
    "monthly_trading_days": {  
      "date_range": {  
        "field": "date",  
        "format": "yyyy-MM-dd",  
        "ranges": [ { "from": "2018-12-01", "to": "2019-04-  
01" }, { "from": "2019-01-01", "to": "2019-01-01|+1M" } ]  
      }  
    }  
  }  
}
```

```
curl --location --request POST "http://localhost:9200/cf_etf_hist_price/_search" --  
header "Content-Type: application/json" --header "accept: application/json" --data  
$'{\"size\": 0, \"query\": { \"match\": { \"symbol\": \"ACWF\"}},  
\"aggs\": { \"monthly_trading_days\": { \"date_range\": { \"field\": \"date\",  
\"format\": \"yyyy-MM-dd\", \"ranges\": [{ \"from\": \"2018-12-01\", \"to\": \"2019-04-  
01\"}, { \"from\": \"2019-01-01\", \"to\": \"2019-01-01|+1M\"} ] } } } }'
```

Example Request - cf_etf_hist_price_filter_sub_aggs

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

HEADERS

Content-Type
application/json

accept
application/json

BODY

```
{
  "size": 0,
  "aggs": {
    "avg_changePercent_at_date": {
      "filter": { "term": { "date": "2019-02-15" } },
      "aggs": { "avg_changePercent": { "avg": { "field":
"changePercent" } } }
    }
  }
}
```

```
curl --location --request POST "http://localhost:9200/cf_etf_hist_price/_search" --
header "Content-Type: application/json" --header "accept: application/json" --data
$'{"size": 0, "aggs": { "avg_changePercent_at_date": { "filter": { "term":
{ "date": "2019-02-15" } }, "aggs": { "avg_changePercent": { "avg": { "field":
"changePercent" } } } } }'
```

Example Request - cf_etf_hist_price_filters

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

HEADERS

Content-Type
application/json
accept
application/json

BODY

```
{
  "size": 0,
  "query": { "term": { "date": "2019-02-15" } },
  "aggs": {
    "filters_avg_changePercent": {
      "filters": {
        "filters": {
          "less_than_avg": { "range":
{"changePercent": { "lt": 0.60385 } } },
          "greater_than_avg": { "range":
{"changePercent": { "gte": 0.60385 } } }
        }
      }
    }
  }
}
```

```
curl --location --request POST "http://localhost:9200/cf_etf_hist_price/_search" --
header "Content-Type: application/json" --header "accept: application/json" --data
$'{"size": 0, "query": { "term": { "date": "2019-02-15" } },
"aggs": { "filters_avg_changePercent": { "filters": { "filters":
```

```
{ \"less_than_avg\": {\"range\": {\"changePercent\":{\"lt\":0.60385}}},  
\"greater_than_avg\":{\"range\": {\"changePercent\":{\"gte\":0.60385}} } } } }
```

Example Request - cf_etf_hist_price_terms_rating

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

HEADERS

Content-Type
application/json
accept
application/json

BODY

```
{  
  "size": 0,  
  "aggs":{  
    "terms_on_rating": {  
      "terms":{  
        "field":"rating"  
      }  
    }  
  }  
}
```

```
curl --location --request POST "http://localhost:9200/cf_etf/_search" --header  
"Content-Type: application/json" --header "accept: application/json" --data  
$'{\"size\": 0, \"aggs\":{ \"terms_on_rating\":  
{ \"terms\":{ \"field\": \"rating\" } } } }'
```

Example Request - cf_etf_hist_price_significant_terms

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

HEADERS

Content-Type
application/json
accept
application/json

BODY

```
{  
  "size": 0,  
  "query":{"match":{"rating":5}},  
  "aggs":{  
    "rating_vs_morningstar":{  
      "significant_terms":{  
        "field":"morningstar_category"  
      }  
    }  
  }  
}
```

```
curl --location --request POST "http://localhost:9200/cf_etf/_search" --header
"Content-Type: application/json" --header "accept: application/json" --data
$'\{"size\: 0, \\"query\\":{\\"match\\":{\\"rating\\":5}},
\\"aggs\\":{ \\"rating_vs_morningstar\\":{ \\"significant_terms\\":{ \\"field\\":\\"morningstar
_category\\" } } } }'
```

Example Request - cf_etf_hist_price_significant_text

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

HEADERS

Content-Type
application/json
accept
application/json

BODY

```
{
  "size": 0,
  "query": {"match": {"rating": 5}},
  "aggs": {
    "rating_vs_fund_name": {
      "significant_text": {
        "field": "fund_name",
        "exclude": ["us", "p", "s", "cap"],
        "size": 5
      }
    }
  }
}
```

```
curl --location --request POST "http://localhost:9200/cf_etf/_search" --header
"Content-Type: application/json" --header "accept: application/json" --data
$'\{"size\: 0, \\"query\\":{\\"match\\":{\\"rating\\":5}},
\\"aggs\\":{ \\"rating_vs_fund_name\\":{ \\"significant_text\\":{ \\"field\\":\\"fund_name\\",
\\"exclude\\": [\\"us\\", \\"p\\", \\"s\\", \\"cap\\"], \\"size\\":5 } } } }'
```

Example Request - cf_etf_hist_price_sampler

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

HEADERS

Content-Type
application/json

BODY

```
{
  "size": 0,
  "aggs": {
    "sampling": {
      "sampler": { "shard_size": 150 },
      "aggs": {
        "significant_terms_category": {
```

```

        "significant_terms": {
          "field": "category"
        }
      }
    }
  }
}

```

```

curl --location --request POST "http://localhost:9200/cf_etf/_search" --header
"Content-Type: application/json" --data '${\"size\": 0, \"aggs\": { \"sampling\":
{ \"sampler\": { \"shard_size\":150}, \"aggs\": { \"significant_terms_category\":
{ \"significant_terms\": { \"field\": \"category\" } } } } } }'

```

Example Request - cf_etf_hist_price_diversified_sampler_10

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

HEADERS

Content-Type
application/json

BODY

```

{
  "size": 0,
  "aggs": {
    "sampling": {
      "diversified_sampler": {"field":"family", "shard_size":150,
"max_docs_per_value" : 10},
      "aggs": {
        "significant_terms_category": {
          "significant_terms": {
            "field": "category"
          }
        }
      }
    }
  }
}

```

```

curl --location --request POST "http://localhost:9200/cf_etf/_search" --header
"Content-Type: application/json" --data '${\"size\": 0, \"aggs\": { \"sampling\":
{ \"diversified_sampler\": {\"field\": \"family\", \"shard_size\":150,
\"max_docs_per_value\" : 10}, \"aggs\": { \"significant_terms_category\":
{ \"significant_terms\": { \"field\": \"category\" } } } } } }'

```

Example Request - cf_etf_hist_price_diverified_sampler_61

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

HEADERS

Content-Type

application/json

BODY

```
{
  "size": 0,
  "aggs": {
    "sampling": {
      "diversified_sampler": {"field": "family", "shard_size": 150,
"max_docs_per_value" : 61},
      "aggs": {
        "significant_terms_category": {
          "significant_terms": {
            "field": "category"
          }
        }
      }
    }
  }
}
```

```
curl --location --request POST "http://localhost:9200/cf_etf/_search" --header
"Content-Type: application/json" --data '{"size": 0, "aggs": { "sampling":
{ "diversified_sampler": {"field": "family", "shard_size": 150,
"max_docs_per_value" : 61}, "aggs": { "significant_terms_category":
{ "significant_terms": { "field": "category" } } } } } }
```

Example Request - cf_etf_dividend_nested_amount

POST http://localhost:9200/cf_etf_dividend_nested/_search

HEADERS

Content-Type
application/json

BODY

```
{
  "size": 0,
  "aggs": {
    "per_symbol": {
      "terms": {"field": "symbol", "size": 3},
      "aggs": {
        "total_dividend": {
          "nested": {
            "path": "announcement"
          },
          "aggs": {
            "total_amount": {"sum": {"field":
"announcement.amount"}}
          }
        }
      }
    }
  }
}
```

```
curl --location --request POST "http://localhost:9200/cf_etf_dividend_nested/_search"
--header "Content-Type: application/json" --data
$'{\ "size\":0, \ "aggs\":{\ "per_symbol\":{\ "terms\":{\ "field\":"symbol\","size\":3}, \
aggs\":{\ "total_dividend\":{\ "nested\":{\ "path\":"announcement\","aggs\":{\ "total_a
mount\":{\ "sum\":{\ "field\":"announcement.amount\"}\}}\}}\}}\}}
```

Example Request - cf_etf_dividend_reverse_nested

POST http://localhost:9200/cf_etf_dividend_nested/_search

HEADERS

Content-Type
application/json

BODY

```
{
  "size":0,
  "aggs": {
    "etf_category_distribution_on_dividend_type":{
      "nested": {
        "path":"announcement"
      },
      "aggs":{
        "by_dividend_type": {
          "terms": {"field":"announcement.type"},
          "aggs": {
            "total_by_etf_category":{
              "reverse_nested":{},
              "aggs": {
                "category":{"terms":
{"field": "category"}}
              }
            }
          }
        }
      }
    }
  }
}
```

```
curl --location --request POST "http://localhost:9200/cf_etf_dividend_nested/_search"
--header "Content-Type: application/json" --data $'{ \ "size\":0, \ "aggs\":
{ \ "etf_category_distribution_on_dividend_type\":{ \ "nested\":
{ \ "path\":"announcement\","aggs\":{ \ "by_dividend_type\": { \ "terms\":
{ \ "field\":"announcement.type\","aggs\":
{ \ "total_by_etf_category\":{ \ "reverse_nested\":{}, \ "aggs\":
{ \ "category\":{ \ "terms\": { \ "field\":"category\"}\} } } } } } } } }
```

Example Request - cf_etf_global

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

HEADERS

Content-Type
application/json

BODY

```
{
  "size":0,
  "query":{"prefix":{"family":"iShares"}},
  "aggs": {
    "ishares_avg_rating": {"avg": {"field":"rating"}},
    "overall_avg_rating": {"global":{}},
  "aggs":{"global_avg_rating":{"avg":{"field":"rating"}}}}
  }
}
```

```
curl --location --request POST "http://localhost:9200/cf_etf/_search" --header
"Content-Type: application/json" --data '${ "size":0, "query":{"prefix":
{"family":"iShares"}}, "aggs": { "ishares_avg_rating": {"avg":
{"field":"rating"}}, "overall_avg_rating": {"global":{}},
"aggs":{"global_avg_rating":{"avg":{"field":"rating"}}}} } }
```

Example Request - cf_etf_missing_category

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

HEADERS

Content-Type
application/json

BODY

```
{
  "size":0,
  "aggs": {
    "not_rated_count": {
      "missing": {"field":"rating"}
    }
  }
}
```

```
curl --location --request POST "http://localhost:9200/cf_etf/_search" --header
"Content-Type: application/json" --data
${ "size":0, "aggs":{"not_rated_count":{"missing":{"field":"rating"}}}} }
```

Example Request - cf_etf_composite

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

HEADERS

Content-Type
application/json

BODY

```
{
  "query": {"query_string": {"query": "rating:[4 TO 5]"}},
  "size": 0,
  "aggs": {
    "multi_sources": {
      "composite": {
        "sources": [
          {"family": {"terms": {"field": "family"}}},
          {"rating": {"terms": {"field": "rating"}}}
        ],
        "size": 5
      }
    }
  }
}
```

```
curl --location --request POST "http://localhost:9200/cf_etf/_search" --header
"Content-Type: application/json" --data '${ "query": { "query_string": { "query":
"rating:[4 TO 5]"}, "size": 0, "aggs": { "multi_sources": { "composite":
{ "sources": [ { "family": { "terms": { "field": "family" } } }, { "rating":
{ "terms": { "field": "rating" } } } ], "size": 5 } } } } }
```

Example Request - cf_etf_adjacent_matrix

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

HEADERS

Content-Type
application/json

BODY

```
{
  "size": 0,
  "aggs": {
    "adjacency_filters": {
      "adjacency_matrix": {
        "filters": {
          "rating_gte_5": {"range": {"rating": {"gte": 5}}},
          "family_prefix_A": {"prefix": {"family": "iShares"}}
        }
      }
    }
  }
}
```

```
curl --location --request POST "http://localhost:9200/cf_etf/_search" --header
"Content-Type: application/json" --data '${ "size": 0, "aggs":
{ "adjacency_filters": { "adjacency_matrix": { "filters": { "rating_gte_5":
{ "range": { "rating": { "gte": 5 } } }, "family_prefix_A":
{ "prefix": { "family": "iShares" } } } } } } }
```

Example Request - cf_etf_dividend_join_parent_aggs

POST localhost:9200/cf_etf_dividend_join/_search

HEADERS

Content-Type
application/json

BODY

```
{
  "size": 0,
  "aggs": {
    "cf_etf": {
      "parent": {
        "type": "dividend"
      },
      "aggs": {
        "count": { "value_count": { "field": "symbol" } }
      }
    }
  }
}
```

```
curl --location --request POST "localhost:9200/cf_etf_dividend_join/_search" --header
"Content-Type: application/json" --data
'${"size":0,"aggs":{"cf_etf":{"parent":{"type":"dividend"},"aggs":{"count":{"value_count":{"field":"symbol"}}}}}}'
```

Example Request - cf_etf_dividend_join_children_aggs

POST localhost:9200/cf_etf_dividend_join/_search

HEADERS

Content-Type
application/json

BODY

```
{
  "aggs": {
    "dividends_for_symbol": {
      "terms": { "field": "symbol" },
      "aggs": { "dividend": { "children": { "type": "dividend" },
        "aggs": { "total_dividend": { "sum": { "field": "amount" } } } } }
    }
  }
}
```

```
curl --location --request POST "localhost:9200/cf_etf_dividend_join/_search" --header
"Content-Type: application/json" --data
'${"size":0,"aggs":{"dividend_for_symbol":{"terms":{"field":"symbol"},"aggs":{"dividend":{"children":{"type":"dividend"},"aggs":{"total_dividend":{"sum":{"field":"amount"}}}}}}}}'
```

Example Request - cf_etf_hist_price_acwf_avg_monthly_close

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

HEADERS

Content-Type
application/json
accept
application/json

BODY

```
{
  "size": 0,
  "query": {"match": {"symbol": "ACWF"}},
  "aggs": {
    "monthly_avg_close": {
      "date_histogram": {
        "field": "date",
        "interval": "month",
        "format": "yyyy-MM-dd"
      },
      "aggs": {
        "avg_close_on_month": {
          "avg": {"field": "close"}
        }
      }
    },
    "overall_avg_close": {
      "avg_bucket": {
        "buckets_path": "monthly_avg_close>avg_close_on_month"
      }
    }
  }
}
```

```
curl --location --request POST "http://localhost:9200/cf_etf_hist_price/_search" --
header "Content-Type: application/json" --header "accept: application/json" --data
$'{\"size\": 0, \"query\": {\"match\": {\"symbol\": \"ACWF\"}},
\"aggs\": { \"monthly_avg_close\": { \"date_histogram\": { \"field\": \"date\",
\"interval\": \"month\", \"format\": \"yyyy-MM-dd\" },
\"aggs\": { \"avg_close_on_month\": { \"avg\": {\"field\": \"close\"} } } },
\"overall_avg_close\": { \"avg_bucket\": { \"buckets_path\":
\"monthly_avg_close>avg_close_on_month\" } } } }'
```

Example Request - cf_etf_hist_price_acwf_max_monthly_avg_close

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

HEADERS

Content-Type
application/json
accept
application/json

BODY

```
{
  "size": 0,
  "query": {"match": {"symbol": "ACWF"}},
```

```

    "aggs":{
      "monthly_avg_close": {
        "date_histogram":{
          "field": "date",
          "interval": "month",
          "format": "yyyy-MM-dd"
        },
        "aggs":{
          "avg_close_on_month":{
            "avg":{"field":"close"}
          }
        }
      },
      "overall_max_avg_close":{
        "max_bucket": {
          "buckets_path": "monthly_avg_close>avg_close_on_month"
        }
      }
    }
  }
}

```

```

curl --location --request POST "http://localhost:9200/cf_etf_hist_price/_search" --
header "Content-Type: application/json" --header "accept: application/json" --data
$'{\"size\": 0, \"query\":{\"match\": {\"symbol\": \"ACWF\"}},
\"aggs\":{ \"monthly_avg_close\": { \"date_histogram\":{ \"field\": \"date\",
\"interval\": \"month\", \"format\": \"yyyy-MM-dd\" },
\"aggs\":{ \"avg_close_on_month\":{ \"avg\":{\"field\": \"close\"} } } },
\"overall_max_avg_close\":{ \"max_bucket\": { \"buckets_path\":
\"monthly_avg_close>avg_close_on_month\" } } } }'

```

Example Request - cf_etf_hist_price_acwf_min_monthly_avg_close

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

HEADERS

Content-Type
application/json
accept
application/json

BODY

```

{
  "size": 0,
  "query":{ "match": { "symbol": "ACWF"}},
  "aggs":{
    "monthly_avg_close": {
      "date_histogram":{
        "field": "date",
        "interval": "month",
        "format": "yyyy-MM-dd"
      },
      "aggs":{
        "avg_close_on_month":{
          "avg":{"field":"close"}
        }
      }
    }
  }
}

```

```

    },
    "overall_min_avg_close":{
      "min_bucket": {
        "buckets_path": "monthly_avg_close>avg_close_on_month"
      }
    }
  }
}

```

```

curl --location --request POST "http://localhost:9200/cf_etf_hist_price/_search" --
header "Content-Type: application/json" --header "accept: application/json" --data
$'\{"size\": 0, \"query\":{\\"match\\": {\\"symbol\\":\\"ACWF\\"}},
\\\"aggs\\":{ \\"monthly_avg_close\\": { \\"date_histogram\\":{ \\"field\\": \\"date\\",
\\\"interval\\": \\"month\\", \\"format\\": \\"yyyy-MM-dd\\\" },
\\\"aggs\\":{ \\"avg_close_on_month\\":{ \\"avg\\":{\\"field\\":\\"close\\"} } } },
\\\"overall_min_avg_close\\":{ \\"min_bucket\\": { \\"buckets_path\\":
\\\"monthly_avg_close>avg_close_on_month\\\" } } } }'

```

Example Request - cf_etf_hist_price_acwf_sum_monthly_change

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

HEADERS

Content-Type
application/json
accept
application/json

BODY

```

{
  "size": 0,
  "query": {"match": {"symbol": "ACWF"}},
  "aggs": {
    "monthly_change": {
      "date_histogram": {
        "field": "date",
        "interval": "month",
        "format": "yyyy-MM-dd"
      },
      "aggs": {
        "change_on_month": {
          "sum": {"field": "change"}
        }
      }
    },
    "overall_monthly_change": {
      "sum_bucket": {
        "buckets_path": "monthly_change>change_on_month"
      }
    }
  }
}

```

```

curl --location --request POST "http://localhost:9200/cf_etf_hist_price/_search" --
header "Content-Type: application/json" --header "accept: application/json" --data

```



```

$'\{"size\": 0, \"query\":{\\"match\\": {\\"symbol\\":\\"ACWF\\"}},
\\\"aggs\\":{ \\"monthly_change\\": { \\"date_histogram\\":{ \\"field\\": \\"date\\",
\\\"interval\\": \\"month\\", \\"format\\": \\"yyyy-MM-dd\\\" },
\\\"aggs\\":{ \\"change_on_month\\":{ \\"sum\\":{\\"field\\":\\"change\\"} } } },
\\\"overall_monthly_change\\":{ \\"sum_bucket\\": { \\"buckets_path\\":
\\\"monthly_change>change_on_month\\\" } } } }'

```

Example Request - cf_etf_hist_price_acwf_statistics_monthly_change

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

HEADERS

Content-Type
application/json
accept
application/json

BODY

```

{
  "size": 0,
  "query": {"match": {"symbol": "ACWF"}},
  "aggs": {
    "monthly_change": {
      "date_histogram": {
        "field": "date",
        "interval": "month",
        "format": "yyyy-MM-dd"
      },
      "aggs": {
        "change_on_month": {
          "sum": {"field": "change"}
        }
      }
    },
    "stats_monthly_change": {
      "stats_bucket": {
        "buckets_path": "monthly_change>change_on_month"
      }
    }
  }
}

```

```

curl --location --request POST "http://localhost:9200/cf_etf_hist_price/_search" --
header "Content-Type: application/json" --header "accept: application/json" --data
$'\{"size\": 0, \"query\":{\\"match\\": {\\"symbol\\":\\"ACWF\\"}},
\\\"aggs\\":{ \\"monthly_change\\": { \\"date_histogram\\":{ \\"field\\": \\"date\\",
\\\"interval\\": \\"month\\", \\"format\\": \\"yyyy-MM-dd\\\" },
\\\"aggs\\":{ \\"change_on_month\\":{ \\"sum\\":{\\"field\\":\\"change\\"} } } },
\\\"overall_monthly_change\\":{ \\"sum_bucket\\": { \\"buckets_path\\":
\\\"monthly_change>change_on_month\\\" } } } }'

```

Example Request - cf_etf_hist_price_acwf_extended_statistics_monthly_change

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

HEADERS

Content-Type
application/json
accept
application/json

BODY

```
{
  "size": 0,
  "query": {"match": {"symbol": "ACWF"}},
  "aggs": {
    "monthly_change": {
      "date_histogram": {
        "field": "date",
        "interval": "month",
        "format": "yyyy-MM-dd"
      },
      "aggs": {
        "change_on_month": {
          "sum": {"field": "change"}
        }
      }
    },
    "extended_stats_monthly_change": {
      "extended_stats_bucket": {
        "buckets_path": "monthly_change>change_on_month"
      }
    }
  }
}
```

```
curl --location --request POST "http://localhost:9200/cf_etf_hist_price/_search" --
header "Content-Type: application/json" --header "accept: application/json" --data
$'{\"size\": 0, \"query\": {\"match\": {\"symbol\": \"ACWF\"}},
\"aggs\": { \"monthly_change\": { \"date_histogram\": { \"field\": \"date\",
\"interval\": \"month\", \"format\": \"yyyy-MM-dd\" },
\"aggs\": { \"change_on_month\": { \"sum\": {\"field\": \"change\"} } } },
\"extended_stats_monthly_change\": { \"extended_stats_bucket\": { \"buckets_path\":
\"monthly_change>change_on_month\" } } } }'
```

Example Request - cf_etf_hist_price_acwf_percentiles_weekly_change

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

HEADERS

Content-Type
application/json
accept
application/json

BODY

```
{
  "size": 0,
  "query": {"match": {"symbol": "ACWF"}},
```

```

    "aggs":{
      "weekly_change": {
        "date_histogram":{
          "field": "date",
          "interval": "week",
          "format": "yyyy-MM-dd"
        },
        "aggs":{
          "change_on_week":{
            "sum":{"field":"change"}
          }
        }
      },
      "percentile_weekly_change":{
        "percentiles_bucket": {
          "buckets_path": "weekly_change>change_on_week"
        }
      }
    }
  }
}

```

```

curl --location --request POST "http://localhost:9200/cf_etf_hist_price/_search" --
header "Content-Type: application/json" --header "accept: application/json" --data
$'{
  "size": 0,
  "query":{
    "match": {
      "symbol": "ACWF"
    }
  },
  "aggs":{
    "weekly_change": {
      "date_histogram":{
        "field": "date",
        "interval": "week",
        "format": "yyyy-MM-dd"
      },
      "aggs":{
        "change_on_week":{
          "sum":{"field":"change"}
        }
      }
    },
    "percentile_weekly_change":{
      "percentiles_bucket": {
        "buckets_path": "weekly_change>change_on_week"
      }
    }
  }
}'

```

Example Request - cf_etf_hist_price_acwf_cumulative_sum

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

HEADERS

Content-Type
application/json
accept
application/json

BODY

```

{
  "size": 0,
  "query":{
    "match": {
      "symbol": "ACWF"
    }
  },
  "aggs":{
    "monthly_change": {
      "date_histogram":{
        "field": "date",
        "interval": "month",
        "format": "yyyy-MM-dd"
      },
      "aggs":{
        "change_on_month":{
          "sum":{"field":"change"}
        },
        "cumulative_change":{

```

```

    "cumulative_sum": {
      "buckets_path": "change_on_month"
    }
  }
}

```

```
curl --location --request POST "http://localhost:9200/cf_etf_hist_price/_search" --header "Content-Type: application/json" --header "accept: application/json" --data '{"size":0,"query":{"match":{"symbol":"ACWF"}},\n"aggs":{"monthly_change":{"date_histogram":{"field":"date","interval":"month","format":"yyyy-MM-dd"},\n"aggs":{"change_on_month":{"sum":{"field":"change"}},\n"cumulative_change":{"cumulative_sum":{"buckets_path":"change_on_month"}}}}}}'
```

Example Request - cf_etf_hist_price_acwf_derivative

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

HEADERS

```
Content-Type
application/json
accept
application/json
```

BODY

```
{
  "size": 0,
  "query": {"match": {"symbol": "ACWF"}},
  "aggs": {
    "monthly_change": {
      "date_histogram": {
        "field": "date",
        "interval": "month",
        "format": "yyyy-MM-dd"
      },
      "aggs": {
        "change_on_month": {
          "sum": {"field": "change"}
        },
        "first_order_derivative": {
          "derivative": {
            "buckets_path": "change_on_month"
          }
        },
        "second_order_derivative": {
          "derivative": {
            "buckets_path": "first_order_derivative"
          }
        }
      }
    }
  }
}
```

```
curl --location --request POST "http://localhost:9200/cf_etf_hist_price/_search" --
header "Content-Type: application/json" --header "accept: application/json" --data
$'{\ "size\": 0, \ "query\":{\ "match\": {\ "symbol\":"ACWF"}},
\ "aggs\":{\ "monthly_change\": { \ "date_histogram\":{\ "field\": \ "date",
\ "interval\": \ "month", \ "format\": \ "yyyy-MM-dd" },
\ "aggs\":{\ "change_on_month\":{\ "sum\":{\ "field\":"change"} },
\ "first_order_derivative\":{\ "derivative\": { \ "buckets_path\":
\ "change_on_month" } }, \ "second_order_derivative\": { \ "derivative\":
{ \ "buckets_path\": \ "first_order_derivative" } } } } } }'
```

Example Request - cf_etf_hist_price_bucket_script

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

HEADERS

Content-Type
application/json
accept
application/json

BODY

```
{
  "size": 0,
  "query": {"match": {"symbol": "ACWF"}},
  "aggs": {
    "monthly_change": {
      "date_histogram": {
        "field": "date",
        "interval": "month",
        "format": "yyyy-MM-dd"
      },
      "aggs": {
        "change_on_month": { "sum": { "field": "change" } },
        "min_change_on_month": { "min": { "field": "change" } },
        "max_change_on_month": { "max": { "field": "change" } },
        "range_of_change": {
          "bucket_script": {
            "buckets_path": {
              "min_value": "min_change_on_month",
              "max_value": "max_change_on_month"
            },
            "script": "params.max_value -
params.min_value"
          }
        }
      }
    }
  }
}
```

```
curl --location --request POST "http://localhost:9200/cf_etf_hist_price/_search" --
header "Content-Type: application/json" --header "accept: application/json" --data
$'{\ "size\":0,\ "query\":{\ "match\":{\ "symbol\":"ACWF"}},\ "aggs\":{\ "monthly_change\":
{\ "date_histogram\":{\ "field\":"date",\ "interval\":"month",\ "format\":"yyyy-MM-
```

```
dd\"},\"aggs\":{\"change_on_month\":{\"sum\":{\"field\":\"change\"}},\"min_change_on_m
onth\":{\"min\":{\"field\":\"change\"}},\"max_change_on_month\":{\"max\":{\"field\":\"
change\"}},\"range_of_change\":{\"bucket_script\":{\"buckets_path\":{\"min_value\":\"m
in_change_on_month\",\"max_value\":\"max_change_on_month\"},\"script\":\"params.max_va
lue - params.min_value\"}}}}}'
```

Example Request - cf_etf_hist_price_bucket_selector

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

HEADERS

Content-Type
application/json
accept
application/json

BODY

```
{
  "size": 0,
  "query": {"match": {"symbol": "ACWF"}},
  "aggs": {
    "negative_monthly_change": {
      "date_histogram": {
        "field": "date",
        "interval": "month",
        "format": "yyyy-MM-dd"
      },
      "aggs": {
        "change_on_month": { "sum": { "field": "change" } },
        "filter_positive_change_on_month": {
          "bucket_selector": {
            "buckets_path": {
              "monthly_change_value": "change_on_mo
nth"
            },
            "script": "params.monthly_change_value<0"
          }
        }
      }
    }
  }
}
```

```
curl --location --request POST "http://localhost:9200/cf_etf_hist_price/_search" --
header "Content-Type: application/json" --header "accept: application/json" --data
$'{"size":0,"query":{"match":{"symbol":"ACWF"}},\"aggs\":{\"negative_monthly
_change\":{\"date_histogram\":{\"field\":\"date\",\"interval\":\"month\",\"format\":\"
yyyy-MM-
dd\"},\"aggs\":{\"change_on_month\":{\"sum\":{\"field\":\"change\"}},\"filter_positive
_change_on_month\":{\"bucket_selector\":{\"buckets_path\":{\"monthly_change_value\":\"
change_on_month\"},\"script\":\"params.monthly_change_value<0\"}}}}}'
```

Example Request - cf_etf_dividend_nested_amount bucket_sort

POST http://localhost:9200/cf_etf_dividend_nested/_search

HEADERS

Content-Type
application/json

BODY

```
{
  "size":0,
  "aggs": {
    "per_symbol":{
      "terms": {"field":"symbol"},
      "aggs":{
        "total_dividend": {
          "nested": {
            "path":"announcement"
          },
          "aggs": {
            "total_amount": {"sum": {"field":
"announcement.amount"}}
          }
        },
        "sort": {
          "bucket_sort": {
            "sort":
[{"total_dividend.total_amount":{"order":"desc"}]},
            "from":0,
            "size":3
          }
        }
      }
    }
  }
}
```

```
curl --location --request POST "http://localhost:9200/cf_etf_dividend_nested/_search"
--header "Content-Type: application/json" --data '${ "size":0, "aggs":
{ "per_symbol":{"terms":{"field":"symbol"}, "aggs":{"total_dividend":
{ "nested": { "path":"announcement" }, "aggs": { "total_amount": {"sum":
{"field": "announcement.amount"}} } } }, "sort": { "bucket_sort": { "sort":
[{"total_dividend.total_amount":{"order":"desc"}]}, "from":0,
"size":3 } } } } ' }
```

Example Request - cf_etf_hist_price_acwf_serial_diff

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

HEADERS

Content-Type
application/json

BODY

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

```

"query":{"match": {"symbol":"ACWF"}},
"aggs":{"
  "serial_diff_weekly_avg_change": {
    "date_histogram":{"
      "field": "date",
      "interval": "week",
      "format": "yyyy-MM-dd"
    },
    "aggs":{"
      "weekly_avg_change":{"
        "avg":{"field":"change"}
      },
      "weekly_avg_serial_diff": {
        "serial_diff": {
          "buckets_path":"weekly_avg_change",
          "lag":1
        }
      }
    }
  }
}
}

```

```

curl --location --request POST "http://localhost:9200/cf_etf_hist_price/_search" --
header "Content-Type: application/json" --data '${\"size\": 0, \"query\":{\"match\":
{\"symbol\": \"ACWF\"}}, \"aggs\":{\"serial_diff_weekly_avg_change\":
{ \"date_histogram\":{\"field\": \"date\", \"interval\": \"week\", \"format\":
\"yyyy-MM-dd\" }, \"aggs\":{\"weekly_avg_change\":{\"avg\":{\"field\": \"change\"} },
\"weekly_avg_serial_diff\": { \"serial_diff\":
{ \"buckets_path\": \"weekly_avg_change\", \"lag\":1 } } } } } '

```

Example Request - cf_etf_hist_price_acwf_moving_avg_simple

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

HEADERS

Content-Type
application/json
accept
application/json

BODY

```

{
  "size": 0,
  "query":{"match": {"symbol":"ACWF"}},
  "aggs":{"
    "monthly_change": {
      "date_histogram":{"
        "field": "date",
        "interval": "week",
        "format": "yyyy-MM-dd"
      },

```



```

    "aggs": {
      "weekly_change": {
        "sum": { "field": "change" }
      },
      "weekly_moving_avg": {
        "moving_avg": {
          "buckets_path": "weekly_change",
          "model": "simple",
          "window": 4,
          "predict": 4
        }
      }
    }
  }
}

```

```

curl --location --request POST "http://localhost:9200/cf_etf_hist_price/_search" --
header "Content-Type: application/json" --header "accept: application/json" --data
$'\{"size": 0, \\"query\\":{\\"match\\": {\\"symbol\\":\\"ACWF\\"}}, \\"aggs\\":{\\"monthly_change\\": {\\"date_histogram\\":{\\"field\\": \\"date\\", \\"interval\\": \\"week\\", \\"format\\": \\"yyyy-MM-dd\\" }}, \\"aggs\\":{\\"weekly_change\\":{\\"sum\\":{\\"field\\":\\"change\\"} }}, \\"weekly_moving_avg\\":{\\"moving_avg\\":{\\"buckets_path\\":\\"weekly_change\\", \\"model\\":\\"simple\\", \\"window\\":4, \\"predict\\":4 } } } } }'

```

Example Request - cf_etf_hist_price_acwf_moving_avg_linear

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

HEADERS

Content-Type
application/json
accept
application/json

BODY

```

{
  "size": 0,
  "query": { "match": { "symbol": "ACWF" } },
  "aggs": {
    "monthly_change": {
      "date_histogram": {
        "field": "date",
        "interval": "week",
        "format": "yyyy-MM-dd"
      },
      "aggs": {
        "weekly_change": {
          "sum": { "field": "change" }
        },
        "weekly_moving_avg": {
          "moving_avg": {
            "buckets_path": "weekly_change",
            "model": "linear",
            "window": 4,

```

```

    }
    }
    }
    }
    }
    "predict":4
  }
}

```

```
curl --location --request POST "http://localhost:9200/cf_etf_hist_price/_search" --header "Content-Type: application/json" --header "accept: application/json" --data '{"size": 0, "query": {"match": {"symbol": "ACWF"}}, "aggs": { "monthly_change": { "date_histogram": { "field": "date", "interval": "week", "format": "yyyy-MM-dd" }, "aggs": { "weekly_change": { "sum": { "field": "change" } }, "weekly_moving_avg": { "moving_avg": { "buckets_path": "weekly_change", "model": "linear", "window": 4, "predict": 4 } } } } }
```

Example Request - cf_etf_hist_price_acwf_moving_avg_ewma

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

HEADERS

```
Content-Type: application/json
accept: application/json
```

BODY

```
{
  "size": 0,
  "query": {"match": {"symbol": "ACWF"}},
  "aggs": {
    "monthly_change": {
      "date_histogram": {
        "field": "date",
        "interval": "week",
        "format": "yyyy-MM-dd"
      },
      "aggs": {
        "weekly_change": {
          "sum": {"field": "change"}
        },
        "weekly_moving_avg": {
          "moving_avg": {
            "buckets_path": "weekly_change",
            "model": "ewma",
            "settings": {"alpha": 0.3},
            "window": 4,
            "predict": 4
          }
        }
      }
    }
  }
}
```

```
curl --location --request POST "http://localhost:9200/cf_etf_hist_price/_search" --
header "Content-Type: application/json" --header "accept: application/json" --data
$'{"size":0,"query":{"match":{"symbol":"ACWF"}},\n"aggs":{"monthly_change":
{"date_histogram":{"field":"date","interval":"week","format":"yyyy-MM-
dd"},"aggs":{"weekly_change":{"sum":{"field":"change"}}},\n"weekly_moving_avg
":{"moving_avg":{"buckets_path":"weekly_change","model":"ewma","settings"
:{"alpha":0.3},"window":4,"predict":4}}}}}'
```

Example Request - cf_etf_hist_price_acwf_moving_avg_holt_linear

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

HEADERS

Content-Type
application/json
accept
application/json

BODY

```
{
  "size": 0,
  "query": {"match": {"symbol": "ACWF"}},
  "aggs": {
    "monthly_change": {
      "date_histogram": {
        "field": "date",
        "interval": "week",
        "format": "yyyy-MM-dd"
      },
      "aggs": {
        "weekly_change": {
          "sum": {"field": "change"}
        },
        "weekly_moving_avg": {
          "moving_avg": {
            "buckets_path": "weekly_change",
            "model": "holt",
            "settings": {"alpha": 0.3, "beta": 0.3},
            "window": 4,
            "predict": 4
          }
        }
      }
    }
  }
}
```

```
curl --location --request POST "http://localhost:9200/cf_etf_hist_price/_search" --
header "Content-Type: application/json" --header "accept: application/json" --data
$'{"size": 0, \n"query":{"match": {"symbol":"ACWF"}},
\n"aggs":{"monthly_change": { \n"date_histogram":{"field": \n"date",
\n"interval": \n"week", \n"format": \n"yyyy-MM-dd" }, \n"aggs":
{ \n"weekly_change":{"sum":{"field":"change"}} }, \n"weekly_moving_avg":
```

```
{ \"moving_avg\":{ \"buckets_path\":\"weekly_change\", \"model\":\"holt\",  
\"settings\":{\"alpha\":0.3, \"beta\":0.3, \"window\":4, \"predict\":4 } } } }
```

Example Request - cf_etf_hist_price_acwf_moving_avg_holt_winters

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

HEADERS

Content-Type
application/json
accept
application/json

BODY

```
{  
  "size": 0,  
  "query":{ "match": { "symbol": "ACWF"} },  
  "aggs":{  
    "monthly_change": {  
      "date_histogram":{  
        "field": "date",  
        "interval": "week",  
        "format": "yyyy-MM-dd"  
      },  
      "aggs": {  
        "weekly_change":{  
          "sum":{"field":"change"}  
        },  
        "weekly_moving_avg": {  
          "moving_avg":{  
            "buckets_path":"weekly_change",  
            "model":"holt_winters",  
            "settings":{"type" : "mult", "alpha":0.8,  
"beta":0.3, "gamma":0.3, "period":1},  
            "window":4,  
            "predict":4  
          }  
        }  
      }  
    }  
  }  
}
```

```
curl --location --request POST "http://localhost:9200/cf_etf_hist_price/_search" --  
header "Content-Type: application/json" --header "accept: application/json" --data  
$'{ \"size\": 0, \"query\":{ \"match\": { \"symbol\": \"ACWF\"} },  
\"aggs\":{ \"monthly_change\": { \"date_histogram\":{ \"field\": \"date\",  
\"interval\": \"week\", \"format\": \"yyyy-MM-dd\" }, \"aggs\":  
{ \"weekly_change\":{ \"sum\":{ \"field\": \"change\" } }, \"weekly_moving_avg\":  
{ \"moving_avg\":{ \"buckets_path\": \"weekly_change\", \"model\": \"holt_winters\",  
\"settings\":{ \"type\" : \"mult\", \"alpha\":0.8, \"beta\":0.3, \"gamma\":0.3,  
\"period\":1}, \"window\":4, \"predict\":4 } } } } }'
```

Example Request - cf_etf_hist_price_acwf_moving_fn_max

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

HEADERS

Content-Type
application/json
accept
application/json

BODY

```
{
  "size": 0,
  "query": {"match": {"symbol": "ACWF"}},
  "aggs": {
    "monthly_change": {
      "date_histogram": {
        "field": "date",
        "interval": "week",
        "format": "yyyy-MM-dd"
      },
      "aggs": {
        "weekly_change": {
          "sum": {"field": "change"}
        },
        "max_weekly_change": {
          "moving_fn": {
            "buckets_path": "weekly_change",
            "script": "MovingFunctions.max(values)",
            "window": 4
          }
        }
      }
    }
  }
}
```

```
curl --location --request POST "http://localhost:9200/cf_etf_hist_price/_search" --header "Content-Type: application/json" --header "accept: application/json" --data '$'{"size":0,"query":{"match":{"symbol":"ACWF"}},\n"aggs":{"monthly_change":{"date_histogram":{"field":"date","interval":"week","format":"yyyy-MM-dd"},"aggs":{"weekly_change":{"sum":{"field":"change"}},\n"max_weekly_change":{"moving_fn":{"buckets_path":"weekly_change","script":"MovingFunctions.max(values)","window":4}}}}}}'
```

Example Request - cf_etf_hist_price_acwf_moving_fn_min

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

HEADERS

Content-Type
application/json
accept
application/json

BODY

```
{
```

```

    "size": 0,
    "query": {"match": {"symbol": "ACWF"}},
    "aggs": {
      "monthly_change": {
        "date_histogram": {
          "field": "date",
          "interval": "week",
          "format": "yyyy-MM-dd"
        },
        "aggs": {
          "weekly_change": {
            "sum": {"field": "change"}
          },
          "min_weekly_change": {
            "moving_fn": {
              "buckets_path": "weekly_change",
              "script": "MovingFunctions.min(values)",
              "window": 4
            }
          }
        }
      }
    }
  }
}

```

```

curl --location --request POST "http://localhost:9200/cf_etf_hist_price/_search" --
header "Content-Type: application/json" --header "accept: application/json" --data
$'{
  "size": 0,
  "query": {
    "match": {
      "symbol": "ACWF"
    }
  },
  "aggs": {
    "monthly_change": {
      "date_histogram": {
        "field": "date",
        "interval": "week",
        "format": "yyyy-MM-dd"
      },
      "aggs": {
        "weekly_change": {
          "sum": {
            "field": "change"
          }
        },
        "min_weekly_change": {
          "moving_fn": {
            "buckets_path": "weekly_change",
            "script": "MovingFunctions.min(values)",
            "window": 4
          }
        }
      }
    }
  }
}'

```

Example Request - cf_etf_hist_price_acwf_moving_fn_sum

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

HEADERS

Content-Type
application/json
accept
application/json

BODY

```

{
  "size": 0,
  "query": {"match": {"symbol": "ACWF"}},
  "aggs": {
    "monthly_change": {
      "date_histogram": {
        "field": "date",
        "interval": "week",
        "format": "yyyy-MM-dd"
      },

```

```

        "aggs": {
          "weekly_change": {
            "sum": { "field": "change" }
          },
          "total_weekly_change": {
            "moving_fn": {
              "buckets_path": "weekly_change",
              "script": "MovingFunctions.sum(values)",
              "window": 4
            }
          }
        }
      }
    }
  }
}

```

```

curl --location --request POST "http://localhost:9200/cf_etf_hist_price/_search" --header "Content-Type: application/json" --header "accept: application/json" --data $'{"size": 0, "query": {"match": {"symbol": "ACWF"}}, "aggs": { "monthly_change": { "date_histogram": { "field": "date", "interval": "week", "format": "yyyy-MM-dd" }, "aggs": { "weekly_change": { "sum": { "field": "change" } }, "total_weekly_change": { "moving_fn": { "buckets_path": "weekly_change", "script": "MovingFunctions.sum(values)", "window": 4 } } } } } }'

```

Example Request - cf_etf_hist_price_acwf_moving_fn_unweightedAvg

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

HEADERS

Content-Type
application/json
accept
application/json

BODY

```

{
  "size": 0,
  "query": { "match": { "symbol": "ACWF" } },
  "aggs": {
    "weekly_change": {
      "date_histogram": {
        "field": "date",
        "interval": "week",
        "format": "yyyy-MM-dd"
      },
      "aggs": {
        "weekly_change": {
          "sum": { "field": "change" }
        },
        "weekly_change_unweightedAvg": {
          "moving_fn": {
            "buckets_path": "weekly_change",
            "script": "MovingFunctions.unweightedAvg(values)",
            "window": 4
          }
        }
      }
    }
  }
}

```

```

    }
  }
}

```

```

curl --location --request POST "http://localhost:9200/cf_etf_hist_price/_search" --
header "Content-Type: application/json" --header "accept: application/json" --data
$'{"size":0,"query":{"match":{"symbol":"ACWF"}},\n"aggs":{"weekly_change":
{"date_histogram":{"field":"date","interval":"week","format":"yyyy-MM-
dd"},"aggs":{"weekly_change":{"sum":{"field":"change"}},\n"weekly_change_unw
eightedAvg":{"moving_fn":{"buckets_path":"weekly_change","script":"MovingFun
ctions.unweightedAvg(values)","window":4}}}}}'

```

Example Request - cf_etf_hist_price_acwf_moving_fn_linearweightedAvg

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

HEADERS

Content-Type
application/json
accept
application/json

BODY

```

{
  "size": 0,
  "query": {"match": {"symbol": "ACWF"}},
  "aggs": {
    "monthly_change": {
      "date_histogram": {
        "field": "date",
        "interval": "week",
        "format": "yyyy-MM-dd"
      },
      "aggs": {
        "weekly_change": {
          "sum": {"field": "change"}
        },
        "weekly_change_unweightedAvg": {
          "moving_fn": {
            "buckets_path": "weekly_change",
            "script": "MovingFunctions.linearWeightedAvg
(values)",
            "window": 4
          }
        }
      }
    }
  }
}

```

```

curl --location --request POST "http://localhost:9200/cf_etf_hist_price/_search" --
header "Content-Type: application/json" --header "accept: application/json" --data

```



```
$('#{"size":0,"query":{"match":{"symbol":"ACWF"}},{"aggs":{"weekly_change":{"date_histogram":{"field":"date","interval":"week","format":"yyyy-MM-dd"},"aggs":{"weekly_change":{"sum":{"field":"change"}}},"weekly_change_unweightedAvg":{"moving_fn":{"buckets_path":"weekly_change","script":"MovingFunctions.unweightedAvg(values)}"},"window":4}}}}')
```

Example Request - cf_etf_hist_price_acwf_moving_fn_stdDev

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

HEADERS

Content-Type
application/json
accept
application/json

BODY

```
{
  "size": 0,
  "query": {"match": {"symbol": "ACWF"}},
  "aggs": {
    "monthly_change": {
      "date_histogram": {
        "field": "date",
        "interval": "week",
        "format": "yyyy-MM-dd"
      },
      "aggs": {
        "weekly_change": {
          "sum": {"field": "change"}
        },
        "weekly_change_stdDev": {
          "moving_fn": {
            "buckets_path": "weekly_change",
            "script": "MovingFunctions.stdDev(values,
MovingFunctions.unweightedAvg(values))",
            "window": 4
          }
        }
      }
    }
  }
}
```

```
curl --location --request POST "http://localhost:9200/cf_etf_hist_price/_search" --header "Content-Type: application/json" --header "accept: application/json" --data '$({"size":0,"query":{"match":{"symbol":"ACWF"}},{"aggs":{"monthly_change":{"date_histogram":{"field":"date","interval":"week","format":"yyyy-MM-dd"},"aggs":{"weekly_change":{"sum":{"field":"change"}}},"weekly_change_stdDev":{"moving_fn":{"buckets_path":"weekly_change","script":"MovingFunctions.stdDev(values,MovingFunctions.unweightedAvg(values))"},"window":4}}}}')
```

Example Request - cf_etf_hist_price_acwf_moving_fn_ewma

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

HEADERS

Content-Type
application/json
accept
application/json

BODY

```
{
  "size": 0,
  "query": {"match": {"symbol": "ACWF"}},
  "aggs": {
    "monthly_change": {
      "date_histogram": {
        "field": "date",
        "interval": "week",
        "format": "yyyy-MM-dd"
      },
      "aggs": {
        "weekly_change": {
          "sum": {"field": "change"}
        },
        "weekly_change_ewma": {
          "moving_fn": {
            "buckets_path": "weekly_change",
            "script": "MovingFunctions.ewma(values,
0.3)",
            "window": 4
          }
        }
      }
    }
  }
}
```

```
curl --location --request POST "http://localhost:9200/cf_etf_hist_price/_search" --
header "Content-Type: application/json" --header "accept: application/json" --data
$'{"size":0,"query":{"match":{"symbol":"ACWF"}},\n"aggs":{"monthly_change":
{"date_histogram":{"field":"date","interval":"week","format":"yyyy-MM-
dd"},"aggs":{"weekly_change":{"sum":{"field":"change"}},\n"weekly_change_ewm
a":{"moving_fn":{"buckets_path":"weekly_change","script":"MovingFunctions.ew
ma(values,0.3)","window":4}}}}}'
```

Example Request - cf_etf_hist_price_acwf_moving_fn_holt

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

HEADERS

Content-Type
application/json
accept
application/json

BODY

```
{
  "size": 0,
  "query": {"match": {"symbol": "ACWF"}},
  "aggs": {
    "monthly_change": {
      "date_histogram": {
        "field": "date",
        "interval": "week",
        "format": "yyyy-MM-dd"
      },
      "aggs": {
        "weekly_change": {
          "sum": {"field": "change"}
        },
        "weekly_change_holt": {
          "moving_fn": {
            "buckets_path": "weekly_change",
            "script": "MovingFunctions.holt(values, 0.3,
0.3)",
            "window": 4
          }
        }
      }
    }
  }
}
```

```
curl --location --request POST "http://localhost:9200/cf_etf_hist_price/_search" --
header "Content-Type: application/json" --header "accept: application/json" --data
$'{"size":0,"query":{"match":{"symbol":"ACWF"}},\n"aggs":{"monthly_change":
{"date_histogram":{"field":"date","interval":"week","format":"yyyy-MM-
dd"},"aggs":{"weekly_change":{"sum":{"field":"change"}},\n"weekly_change_hol
t":{"moving_fn":{"buckets_path":"weekly_change","script":"MovingFunctions.ho
lt(values,0.3,0.3)","window":4}}}}}'
```

Example Request - cf_etf_hist_price_acwf_moving_fn_holtwinters

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

HEADERS

Content-Type
application/json
accept
application/json

BODY

```
{
  "size": 0,
  "query": {"match": {"symbol": "ACWF"}},
  "aggs": {
    "monthly_change": {
      "date_histogram": {
        "field": "date",
        "interval": "week",
        "format": "yyyy-MM-dd"
      },
      "aggs": {
        "weekly_change": {
          "sum": {"field": "change"}
        },
        "weekly_change_holt": {
          "moving_fn": {
            "buckets_path": "weekly_change",
            "script": "MovingFunctions.holt(values, 0.3, 0.3)",
            "window": 4
          }
        }
      }
    }
  }
}
```

```

        "aggs": {
          "weekly_change": {
            "sum": { "field": "change" }
          },
          "weekly_change_holtWinters": {
            "moving_fn": {
              "buckets_path": "weekly_change",
              "script": "
MovingFunctions.holtWinters(values, 0.8, 0.3, 0.1, 1, false)",
              "window": 4
            }
          }
        }
      }
    }
  }
}

```

```

curl --location --request POST "http://localhost:9200/cf_etf_hist_price/_search" --
header "Content-Type: application/json" --header "accept: application/json" --data
$'{
  "size": 0,
  "query": {
    "match": {
      "symbol": "ACWF"
    }
  },
  "aggs": {
    "monthly_change": {
      "date_histogram": {
        "field": "date",
        "interval": "week",
        "format": "yyyy-MM-dd"
      },
      "aggs": {
        "weekly_change": {
          "sum": {
            "field": "change"
          }
        },
        "weekly_change_holtWinters": {
          "moving_fn": {
            "buckets_path": "weekly_change",
            "script": "MovingFunctions.holtWinters(values,0.8,0.3,0.1,1,false)",
            "window": 4
          }
        }
      }
    }
  }
}'

```

Example Request - cf_etf_hist_price_terms_rating post_filter

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

HEADERS

Content-Type
application/json
accept
application/json

BODY

```

{
  "aggs": {
    "terms_on_rating": {
      "terms": {
        "field": "rating"
      }
    }
  },
  "post_filter": {
    "range": {
      "rating": { "gte": 5 }
    }
  }
}

```

```

curl --location --request POST "http://localhost:9200/cf_etf/_search" --header
"Content-Type: application/json" --header "accept: application/json" --data

```

```
$'{\ "aggs\":{\ "terms_on_rating\":{\ "terms\":{\ "field\":"rating\"}\}\},  
\ "post_filter\":{\ "range\":{\ "rating\":{\ "gte\":5}\}\}\}\'
```

CHAPTER8