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11/22/2019

Harvard Extension - Big Data Principles e88

**Homework 11: Distributed Indexing and Search with ElasticSearch**

Please identify which problems were completed. If any were incomplete, please identify where you encountered problems:

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| Problem 1: 100%  Problem 2: 100%  Problem 3: 100%  Problem 4: 100%  Problem 5: Bonus 100%  Problem 6: Bonus 100% |

**Problem 1 [25 points] ES setup**

Show main steps you took to install ES + X-Pack + Kibana [15 points]

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Include a screenshot of the Monitoring tab with your cluster state [10 points]

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**Problem 2 [25 Points] basic indexing into ES**

Show ES mapping you created for your data [10 points]

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Show CURL commands you used to index events into ES [5 points]

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| Script generated curl commands, saved into an executable shell script  curl -XPOST 'localhost:9200/hw11\_p2\_index/\_doc/0?pretty' -H 'Content-Type: application/json' -d '{"logId":"id0","eventTime":1574424000000,"url":"http:\/\/300.com\/300","userId":"user9000","us\_country":"ER","browser":"IE","ua\_os":"iPhone","responseCode":237,"ttfb":9.697}'  curl -XPOST 'localhost:9200/hw11\_p2\_index/\_doc/1?pretty' -H 'Content-Type: application/json' -d '{"logId":"id1","eventTime":1574424107000,"url":"http:\/\/500.com\/500","userId":"user55","us\_country":"SJ","browser":"Chrome","ua\_os":"Mac","responseCode":527,"ttfb":9.945}'  curl -XPOST 'localhost:9200/hw11\_p2\_index/\_doc/2?pretty' -H 'Content-Type: application/json' -d '{"logId":"id2","eventTime":1574424219000,"url":"http:\/\/500.com\/500","userId":"user55","us\_country":"SJ","browser":"IE","ua\_os":"Linux","responseCode":507,"ttfb":6.841}'  curl -XPOST 'localhost:9200/hw11\_p2\_index/\_doc/3?pretty' -H 'Content-Type: application/json' -d '{"logId":"id3","eventTime":1574424398000,"url":"http:\/\/100.com\/100","userId":"user55","us\_country":"GD","browser":"Chrome","ua\_os":"iPhone","responseCode":401,"ttfb":1.945}'  curl -XPOST 'localhost:9200/hw11\_p2\_index/\_doc/4?pretty' -H 'Content-Type: application/json' -d '{"logId":"id4","eventTime":1574424530000,"url":"http:\/\/500.com\/500","userId":"user800","us\_country":"ZW","browser":"Edge","ua\_os":"Mac","responseCode":424,"ttfb":1.302}'  curl -XPOST 'localhost:9200/hw11\_p2\_index/\_doc/5?pretty' -H 'Content-Type: application/json' -d '{"logId":"id5","eventTime":1574424672000,"url":"http:\/\/300.com\/300","userId":"user55","us\_country":"SJ","browser":"IE","ua\_os":"Mac","responseCode":112,"ttfb":11.386}'  curl -XPOST 'localhost:9200/hw11\_p2\_index/\_doc/6?pretty' -H 'Content-Type: application/json' -d '{"logId":"id6","eventTime":1574424838000,"url":"http:\/\/500.com\/500","userId":"user10","us\_country":"GD","browser":"Firefox","ua\_os":"iPhone","responseCode":120,"ttfb":7.224}'  curl -XPOST 'localhost:9200/hw11\_p2\_index/\_doc/7?pretty' -H 'Content-Type: application/json' -d '{"logId":"id7","eventTime":1574424995000,"url":"http:\/\/200.com\/200","userId":"user10","us\_country":"SJ","browser":"Chrome","ua\_os":"iPhone","responseCode":348,"ttfb":9.55}'  curl -XPOST 'localhost:9200/hw11\_p2\_index/\_doc/8?pretty' -H 'Content-Type: application/json' -d '{"logId":"id8","eventTime":1574425109000,"url":"http:\/\/400.com\/400","userId":"user800","us\_country":"ZW","browser":"Firefox","ua\_os":"Linux","responseCode":585,"ttfb":4.956}'  curl -XPOST 'localhost:9200/hw11\_p2\_index/\_doc/9?pretty' -H 'Content-Type: application/json' -d '{"logId":"id9","eventTime":1574425256000,"url":"http:\/\/500.com\/500","userId":"user55","us\_country":"GD","browser":"IE","ua\_os":"iPhone","responseCode":434,"ttfb":10.314}'  curl -XPOST 'localhost:9200/hw11\_p2\_index/\_doc/10?pretty' -H 'Content-Type: application/json' -d '{"logId":"id10","eventTime":1574425393000,"url":"http:\/\/100.com\/100","userId":"user800","us\_country":"SJ","browser":"IE","ua\_os":"iPhone","responseCode":484,"ttfb":2.579}'  curl -XPOST 'localhost:9200/hw11\_p2\_index/\_doc/11?pretty' -H 'Content-Type: application/json' -d '{"logId":"id11","eventTime":1574425508000,"url":"http:\/\/100.com\/100","userId":"user800","us\_country":"MA","browser":"Edge","ua\_os":"iPhone","responseCode":225,"ttfb":4.869}'  curl -XPOST 'localhost:9200/hw11\_p2\_index/\_doc/12?pretty' -H 'Content-Type: application/json' -d '{"logId":"id12","eventTime":1574425679000,"url":"http:\/\/200.com\/200","userId":"user9000","us\_country":"MA","browser":"Edge","ua\_os":"Mac","responseCode":341,"ttfb":5.279}'  curl -XPOST 'localhost:9200/hw11\_p2\_index/\_doc/13?pretty' -H 'Content-Type: application/json' -d '{"logId":"id13","eventTime":1574425857000,"url":"http:\/\/400.com\/400","userId":"user10","us\_country":"ER","browser":"IE","ua\_os":"Mac","responseCode":235,"ttfb":8.326}'  curl -XPOST 'localhost:9200/hw11\_p2\_index/\_doc/14?pretty' -H 'Content-Type: application/json' -d '{"logId":"id14","eventTime":1574425973000,"url":"http:\/\/500.com\/500","userId":"user800","us\_country":"MA","browser":"Edge","ua\_os":"Windows","responseCode":326,"ttfb":9.869}'  curl -XPOST 'localhost:9200/hw11\_p2\_index/\_doc/15?pretty' -H 'Content-Type: application/json' -d '{"logId":"id15","eventTime":1574426152000,"url":"http:\/\/100.com\/100","userId":"user800","us\_country":"SJ","browser":"Edge","ua\_os":"iPhone","responseCode":167,"ttfb":4.954}'  curl -XPOST 'localhost:9200/hw11\_p2\_index/\_doc/16?pretty' -H 'Content-Type: application/json' -d '{"logId":"id16","eventTime":1574426297000,"url":"http:\/\/200.com\/200","userId":"user10","us\_country":"MA","browser":"Chrome","ua\_os":"Mac","responseCode":116,"ttfb":12.136}'  curl -XPOST 'localhost:9200/hw11\_p2\_index/\_doc/17?pretty' -H 'Content-Type: application/json' -d '{"logId":"id17","eventTime":1574426449000,"url":"http:\/\/300.com\/300","userId":"user55","us\_country":"MA","browser":"IE","ua\_os":"Linux","responseCode":466,"ttfb":12.639}'  curl -XPOST 'localhost:9200/hw11\_p2\_index/\_doc/18?pretty' -H 'Content-Type: application/json' -d '{"logId":"id18","eventTime":1574426636000,"url":"http:\/\/500.com\/500","userId":"user9000","us\_country":"GD","browser":"Firefox","ua\_os":"iPhone","responseCode":490,"ttfb":12.752}'  curl -XPOST 'localhost:9200/hw11\_p2\_index/\_doc/19?pretty' -H 'Content-Type: application/json' -d '{"logId":"id19","eventTime":1574426790000,"url":"http:\/\/300.com\/300","userId":"user77","us\_country":"ZW","browser":"Edge","ua\_os":"Windows","responseCode":404,"ttfb":0.442}'  curl -XPOST 'localhost:9200/hw11\_p2\_index/\_doc/20?pretty' -H 'Content-Type: application/json' -d '{"logId":"id20","eventTime":1574426901000,"url":"http:\/\/400.com\/400","userId":"user77","us\_country":"ZW","browser":"Edge","ua\_os":"Windows","responseCode":161,"ttfb":8.822}'  curl -XPOST 'localhost:9200/hw11\_p2\_index/\_doc/21?pretty' -H 'Content-Type: application/json' -d '{"logId":"id21","eventTime":1574427600000,"url":"http:\/\/espn.com\/ball","userId":"moo","us\_country":"AQ","browser":"Edge","ua\_os":"Windows","responseCode":573,"ttfb":2.222}'  curl -XPOST 'localhost:9200/hw11\_p2\_index/\_doc/22?pretty' -H 'Content-Type: application/json' -d '{"logId":"id22","eventTime":1574427729000,"url":"http:\/\/amazon.com\/fire","userId":"moo","us\_country":"AD","browser":"Chrome","ua\_os":"Linux","responseCode":533,"ttfb":0.787}'  curl -XPOST 'localhost:9200/hw11\_p2\_index/\_doc/23?pretty' -H 'Content-Type: application/json' -d '{"logId":"id23","eventTime":1574427880000,"url":"http:\/\/500.com\/500","userId":"buck","us\_country":"AF","browser":"Edge","ua\_os":"iPhone","responseCode":585,"ttfb":12.608}'  curl -XPOST 'localhost:9200/hw11\_p2\_index/\_doc/24?pretty' -H 'Content-Type: application/json' -d '{"logId":"id24","eventTime":1574428016000,"url":"http:\/\/amazon.com\/fire","userId":"user77","us\_country":"SJ","browser":"Chrome","ua\_os":"Windows","responseCode":181,"ttfb":7.63}'  curl -XPOST 'localhost:9200/hw11\_p2\_index/\_doc/25?pretty' -H 'Content-Type: application/json' -d '{"logId":"id25","eventTime":1574428186000,"url":"http:\/\/amazon.com\/fire","userId":"moo","us\_country":"ER","browser":"Edge","ua\_os":"Windows","responseCode":363,"ttfb":11.637}'  curl -XPOST 'localhost:9200/hw11\_p2\_index/\_doc/26?pretty' -H 'Content-Type: application/json' -d '{"logId":"id26","eventTime":1574428316000,"url":"http:\/\/espn.com\/ball","userId":"carly","us\_country":"AD","browser":"Chrome","ua\_os":"Windows","responseCode":377,"ttfb":10.663}'  curl -XPOST 'localhost:9200/hw11\_p2\_index/\_doc/27?pretty' -H 'Content-Type: application/json' -d '{"logId":"id27","eventTime":1574428428000,"url":"http:\/\/espn.com\/ball","userId":"user10","us\_country":"SJ","browser":"IE","ua\_os":"Mac","responseCode":404,"ttfb":11.652}'  curl -XPOST 'localhost:9200/hw11\_p2\_index/\_doc/28?pretty' -H 'Content-Type: application/json' -d '{"logId":"id28","eventTime":1574428595000,"url":"http:\/\/300.com\/300","userId":"user55","us\_country":"GD","browser":"IE","ua\_os":"iPhone","responseCode":460,"ttfb":8.506}'  curl -XPOST 'localhost:9200/hw11\_p2\_index/\_doc/29?pretty' -H 'Content-Type: application/json' -d '{"logId":"id29","eventTime":1574428725000,"url":"http:\/\/bing.com\/cat","userId":"user10","us\_country":"AL","browser":"Edge","ua\_os":"Mac","responseCode":228,"ttfb":6.612}'  curl -XPOST 'localhost:9200/hw11\_p2\_index/\_doc/30?pretty' -H 'Content-Type: application/json' -d '{"logId":"id30","eventTime":1574428845000,"url":"http:\/\/100.com\/100","userId":"carly","us\_country":"AF","browser":"Chrome","ua\_os":"iPhone","responseCode":300,"ttfb":10.986}'  curl -XPOST 'localhost:9200/hw11\_p2\_index/\_doc/31?pretty' -H 'Content-Type: application/json' -d '{"logId":"id31","eventTime":1574428953000,"url":"http:\/\/500.com\/500","userId":"moo","us\_country":"AD","browser":"Edge","ua\_os":"Linux","responseCode":461,"ttfb":8.566}'  curl -XPOST 'localhost:9200/hw11\_p2\_index/\_doc/32?pretty' -H 'Content-Type: application/json' -d '{"logId":"id32","eventTime":1574429060000,"url":"http:\/\/bing.com\/cat","userId":"user9000","us\_country":"SJ","browser":"Chrome","ua\_os":"iPhone","responseCode":528,"ttfb":5.372}'  curl -XPOST 'localhost:9200/hw11\_p2\_index/\_doc/33?pretty' -H 'Content-Type: application/json' -d '{"logId":"id33","eventTime":1574429241000,"url":"http:\/\/google.com\/cow","userId":"user800","us\_country":"ZW","browser":"Chrome","ua\_os":"Linux","responseCode":473,"ttfb":9.769}'  curl -XPOST 'localhost:9200/hw11\_p2\_index/\_doc/34?pretty' -H 'Content-Type: application/json' -d '{"logId":"id34","eventTime":1574429429000,"url":"http:\/\/bing.com\/cat","userId":"user10","us\_country":"AQ","browser":"Chrome","ua\_os":"Windows","responseCode":153,"ttfb":12.223}'  curl -XPOST 'localhost:9200/hw11\_p2\_index/\_doc/35?pretty' -H 'Content-Type: application/json' -d '{"logId":"id35","eventTime":1574429621000,"url":"http:\/\/amazon.com\/fire","userId":"user77","us\_country":"AD","browser":"Edge","ua\_os":"iPhone","responseCode":407,"ttfb":0.358}'  curl -XPOST 'localhost:9200/hw11\_p2\_index/\_doc/36?pretty' -H 'Content-Type: application/json' -d '{"logId":"id36","eventTime":1574429727000,"url":"http:\/\/espn.com\/ball","userId":"user55","us\_country":"AD","browser":"Edge","ua\_os":"iPhone","responseCode":174,"ttfb":0.527}'  curl -XPOST 'localhost:9200/hw11\_p2\_index/\_doc/37?pretty' -H 'Content-Type: application/json' -d '{"logId":"id37","eventTime":1574429918000,"url":"http:\/\/500.com\/500","userId":"user800","us\_country":"ER","browser":"IE","ua\_os":"Mac","responseCode":190,"ttfb":9.146}'  curl -XPOST 'localhost:9200/hw11\_p2\_index/\_doc/38?pretty' -H 'Content-Type: application/json' -d '{"logId":"id38","eventTime":1574430091000,"url":"http:\/\/espn.com\/ball","userId":"buck","us\_country":"AL","browser":"Edge","ua\_os":"Windows","responseCode":575,"ttfb":5.191}'  curl -XPOST 'localhost:9200/hw11\_p2\_index/\_doc/39?pretty' -H 'Content-Type: application/json' -d '{"logId":"id39","eventTime":1574430243000,"url":"http:\/\/400.com\/400","userId":"user800","us\_country":"ZW","browser":"IE","ua\_os":"Mac","responseCode":280,"ttfb":2.05}'  curl -XPOST 'localhost:9200/hw11\_p2\_index/\_doc/40?pretty' -H 'Content-Type: application/json' -d '{"logId":"id40","eventTime":1574430345000,"url":"http:\/\/amazon.com\/fire","userId":"carly","us\_country":"ZW","browser":"IE","ua\_os":"Windows","responseCode":449,"ttfb":9.301}'  curl -XPOST 'localhost:9200/hw11\_p2\_index/\_doc/41?pretty' -H 'Content-Type: application/json' -d '{"logId":"id41","eventTime":1574430523000,"url":"http:\/\/espn.com\/ball","userId":"user55","us\_country":"ER","browser":"Edge","ua\_os":"Linux","responseCode":287,"ttfb":4.532}'  curl -XPOST 'localhost:9200/hw11\_p2\_index/\_doc/42?pretty' -H 'Content-Type: application/json' -d '{"logId":"id42","eventTime":1574430718000,"url":"http:\/\/google.com\/cow","userId":"user77","us\_country":"AQ","browser":"Chrome","ua\_os":"Linux","responseCode":183,"ttfb":9.102}'  curl -XPOST 'localhost:9200/hw11\_p2\_index/\_doc/43?pretty' -H 'Content-Type: application/json' -d '{"logId":"id43","eventTime":1574430911000,"url":"http:\/\/200.com\/200","userId":"buck","us\_country":"AD","browser":"Firefox","ua\_os":"Linux","responseCode":407,"ttfb":7.869}'  curl -XPOST 'localhost:9200/hw11\_p2\_index/\_doc/44?pretty' -H 'Content-Type: application/json' -d '{"logId":"id44","eventTime":1574431042000,"url":"http:\/\/espn.com\/ball","userId":"buck","us\_country":"AQ","browser":"Chrome","ua\_os":"Linux","responseCode":431,"ttfb":3.23}'  curl -XPOST 'localhost:9200/hw11\_p2\_index/\_doc/45?pretty' -H 'Content-Type: application/json' -d '{"logId":"id45","eventTime":1574431221000,"url":"http:\/\/200.com\/200","userId":"moo","us\_country":"SJ","browser":"Firefox","ua\_os":"Windows","responseCode":347,"ttfb":0.479}'  curl -XPOST 'localhost:9200/hw11\_p2\_index/\_doc/46?pretty' -H 'Content-Type: application/json' -d '{"logId":"id46","eventTime":1574431401000,"url":"http:\/\/espn.com\/ball","userId":"moo","us\_country":"AQ","browser":"Firefox","ua\_os":"Windows","responseCode":496,"ttfb":0.492}'  curl -XPOST 'localhost:9200/hw11\_p2\_index/\_doc/47?pretty' -H 'Content-Type: application/json' -d '{"logId":"id47","eventTime":1574431536000,"url":"http:\/\/bing.com\/cat","userId":"buck","us\_country":"AQ","browser":"Firefox","ua\_os":"Windows","responseCode":592,"ttfb":2.107}'  curl -XPOST 'localhost:9200/hw11\_p2\_index/\_doc/48?pretty' -H 'Content-Type: application/json' -d '{"logId":"id48","eventTime":1574431657000,"url":"http:\/\/400.com\/400","userId":"user800","us\_country":"AL","browser":"Chrome","ua\_os":"Windows","responseCode":420,"ttfb":3.64}'  curl -XPOST 'localhost:9200/hw11\_p2\_index/\_doc/49?pretty' -H 'Content-Type: application/json' -d '{"logId":"id49","eventTime":1574431823000,"url":"http:\/\/bing.com\/cat","userId":"bob","us\_country":"AF","browser":"Chrome","ua\_os":"Linux","responseCode":586,"ttfb":6.241}'  curl -XPOST 'localhost:9200/hw11\_p2\_index/\_doc/50?pretty' -H 'Content-Type: application/json' -d '{"logId":"id50","eventTime":1574431942000,"url":"http:\/\/espn.com\/ball","userId":"user55","us\_country":"AD","browser":"Chrome","ua\_os":"iPhone","responseCode":374,"ttfb":7.184}'  curl -XPOST 'localhost:9200/hw11\_p2\_index/\_doc/51?pretty' -H 'Content-Type: application/json' -d '{"logId":"id51","eventTime":1574431200000,"url":"http:\/\/300.com\/300","userId":"user55","us\_country":"GD","browser":"IE","ua\_os":"iPhone","responseCode":524,"ttfb":8.082}'  curl -XPOST 'localhost:9200/hw11\_p2\_index/\_doc/52?pretty' -H 'Content-Type: application/json' -d '{"logId":"id52","eventTime":1574431378000,"url":"http:\/\/200.com\/200","userId":"user800","us\_country":"MA","browser":"Edge","ua\_os":"iPhone","responseCode":141,"ttfb":11.138}'  curl -XPOST 'localhost:9200/hw11\_p2\_index/\_doc/53?pretty' -H 'Content-Type: application/json' -d '{"logId":"id53","eventTime":1574431551000,"url":"http:\/\/400.com\/400","userId":"user77","us\_country":"SJ","browser":"IE","ua\_os":"Windows","responseCode":328,"ttfb":10.567}'  curl -XPOST 'localhost:9200/hw11\_p2\_index/\_doc/54?pretty' -H 'Content-Type: application/json' -d '{"logId":"id54","eventTime":1574431671000,"url":"http:\/\/300.com\/300","userId":"user55","us\_country":"SJ","browser":"Chrome","ua\_os":"iPhone","responseCode":273,"ttfb":10.919}'  curl -XPOST 'localhost:9200/hw11\_p2\_index/\_doc/55?pretty' -H 'Content-Type: application/json' -d '{"logId":"id55","eventTime":1574431810000,"url":"http:\/\/300.com\/300","userId":"user10","us\_country":"ZW","browser":"Firefox","ua\_os":"Mac","responseCode":186,"ttfb":10.278}'  curl -XPOST 'localhost:9200/hw11\_p2\_index/\_doc/56?pretty' -H 'Content-Type: application/json' -d '{"logId":"id56","eventTime":1574431936000,"url":"http:\/\/200.com\/200","userId":"user10","us\_country":"ZW","browser":"Chrome","ua\_os":"Mac","responseCode":422,"ttfb":6.513}'  curl -XPOST 'localhost:9200/hw11\_p2\_index/\_doc/57?pretty' -H 'Content-Type: application/json' -d '{"logId":"id57","eventTime":1574432057000,"url":"http:\/\/300.com\/300","userId":"user77","us\_country":"SJ","browser":"Chrome","ua\_os":"Windows","responseCode":542,"ttfb":1.075}'  curl -XPOST 'localhost:9200/hw11\_p2\_index/\_doc/58?pretty' -H 'Content-Type: application/json' -d '{"logId":"id58","eventTime":1574432202000,"url":"http:\/\/200.com\/200","userId":"user10","us\_country":"ER","browser":"Chrome","ua\_os":"Mac","responseCode":275,"ttfb":0.569}'  curl -XPOST 'localhost:9200/hw11\_p2\_index/\_doc/59?pretty' -H 'Content-Type: application/json' -d '{"logId":"id59","eventTime":1574432360000,"url":"http:\/\/300.com\/300","userId":"user77","us\_country":"SJ","browser":"Edge","ua\_os":"Windows","responseCode":357,"ttfb":7.785}' |

Show results of the basic query - content of your index - you can limit the number of results to 10 or so [10 points]

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| {  "took" : 1,  "timed\_out" : false,  "\_shards" : {  "total" : 1,  "successful" : 1,  "skipped" : 0,  "failed" : 0  },  "hits" : {  "total" : {  "value" : 60,  "relation" : "eq"  },  "max\_score" : 1.0,  "hits" : [  {  "\_index" : "hw11\_p2\_index",  "\_type" : "\_doc",  "\_id" : "0",  "\_score" : 1.0,  "\_source" : {  "logId" : "id0",  "eventTime" : 1574424000000,  "url" : "http://300.com/300",  "userId" : "user9000",  "us\_country" : "ER",  "browser" : "IE",  "ua\_os" : "iPhone",  "responseCode" : 237,  "ttfb" : 9.697  }  },  {  "\_index" : "hw11\_p2\_index",  "\_type" : "\_doc",  "\_id" : "1",  "\_score" : 1.0,  "\_source" : {  "logId" : "id1",  "eventTime" : 1574424107000,  "url" : "http://500.com/500",  "userId" : "user55",  "us\_country" : "SJ",  "browser" : "Chrome",  "ua\_os" : "Mac",  "responseCode" : 527,  "ttfb" : 9.945  }  },  {  "\_index" : "hw11\_p2\_index",  "\_type" : "\_doc",  "\_id" : "2",  "\_score" : 1.0,  "\_source" : {  "logId" : "id2",  "eventTime" : 1574424219000,  "url" : "http://500.com/500",  "userId" : "user55",  "us\_country" : "SJ",  "browser" : "IE",  "ua\_os" : "Linux",  "responseCode" : 507,  "ttfb" : 6.841  }  },  {  "\_index" : "hw11\_p2\_index",  "\_type" : "\_doc",  "\_id" : "3",  "\_score" : 1.0,  "\_source" : {  "logId" : "id3",  "eventTime" : 1574424398000,  "url" : "http://100.com/100",  "userId" : "user55",  "us\_country" : "GD",  "browser" : "Chrome",  "ua\_os" : "iPhone",  "responseCode" : 401,  "ttfb" : 1.945  }  },  {  "\_index" : "hw11\_p2\_index",  "\_type" : "\_doc",  "\_id" : "4",  "\_score" : 1.0,  "\_source" : {  "logId" : "id4",  "eventTime" : 1574424530000,  "url" : "http://500.com/500",  "userId" : "user800",  "us\_country" : "ZW",  "browser" : "Edge",  "ua\_os" : "Mac",  "responseCode" : 424,  "ttfb" : 1.302  }  },  {  "\_index" : "hw11\_p2\_index",  "\_type" : "\_doc",  "\_id" : "5",  "\_score" : 1.0,  "\_source" : {  "logId" : "id5",  "eventTime" : 1574424672000,  "url" : "http://300.com/300",  "userId" : "user55",  "us\_country" : "SJ",  "browser" : "IE",  "ua\_os" : "Mac",  "responseCode" : 112,  "ttfb" : 11.386  }  },  {  "\_index" : "hw11\_p2\_index",  "\_type" : "\_doc",  "\_id" : "6",  "\_score" : 1.0,  "\_source" : {  "logId" : "id6",  "eventTime" : 1574424838000,  "url" : "http://500.com/500",  "userId" : "user10",  "us\_country" : "GD",  "browser" : "Firefox",  "ua\_os" : "iPhone",  "responseCode" : 120,  "ttfb" : 7.224  }  },  {  "\_index" : "hw11\_p2\_index",  "\_type" : "\_doc",  "\_id" : "7",  "\_score" : 1.0,  "\_source" : {  "logId" : "id7",  "eventTime" : 1574424995000,  "url" : "http://200.com/200",  "userId" : "user10",  "us\_country" : "SJ",  "browser" : "Chrome",  "ua\_os" : "iPhone",  "responseCode" : 348,  "ttfb" : 9.55  }  },  {  "\_index" : "hw11\_p2\_index",  "\_type" : "\_doc",  "\_id" : "8",  "\_score" : 1.0,  "\_source" : {  "logId" : "id8",  "eventTime" : 1574425109000,  "url" : "http://400.com/400",  "userId" : "user800",  "us\_country" : "ZW",  "browser" : "Firefox",  "ua\_os" : "Linux",  "responseCode" : 585,  "ttfb" : 4.956  }  },  {  "\_index" : "hw11\_p2\_index",  "\_type" : "\_doc",  "\_id" : "9",  "\_score" : 1.0,  "\_source" : {  "logId" : "id9",  "eventTime" : 1574425256000,  "url" : "http://500.com/500",  "userId" : "user55",  "us\_country" : "GD",  "browser" : "IE",  "ua\_os" : "iPhone",  "responseCode" : 434,  "ttfb" : 10.314  }  }  ]  }  } |

**Problem 3 [25 Points] basic ES queries and profiling**

Show code/JSON of your Q1 and the results of its execution: [10 points]

|  |
| --- |
| GET /hw11\_p2\_index/\_search  {  "aggs": {  "agg1": {  "terms": {  "field": "us\_country"  },  "aggs": {  "agg2": {  "terms": {  "field": "browser"  }  }  }  }  }  }      "aggregations" : {  "agg1" : {  "doc\_count\_error\_upper\_bound" : 0,  "sum\_other\_doc\_count" : 0,  "buckets" : [  {  "key" : "ZW",  "doc\_count" : 14,  "agg2" : {  "doc\_count\_error\_upper\_bound" : 0,  "sum\_other\_doc\_count" : 0,  "buckets" : [  {  "key" : "Edge",  "doc\_count" : 5  },  {  "key" : "IE",  "doc\_count" : 5  },  {  "key" : "Chrome",  "doc\_count" : 2  },  {  "key" : "Firefox",  "doc\_count" : 2  }  ]  }  },  {  "key" : "GD",  "doc\_count" : 8,  "agg2" : {  "doc\_count\_error\_upper\_bound" : 0,  "sum\_other\_doc\_count" : 0,  "buckets" : [  {  "key" : "IE",  "doc\_count" : 3  },  {  "key" : "Edge",  "doc\_count" : 2  },  {  "key" : "Firefox",  "doc\_count" : 2  },  {  "key" : "Chrome",  "doc\_count" : 1  }  ]  }  },  {  "key" : "ER",  "doc\_count" : 7,  "agg2" : {  "doc\_count\_error\_upper\_bound" : 0,  "sum\_other\_doc\_count" : 0,  "buckets" : [  {  "key" : "Edge",  "doc\_count" : 3  },  {  "key" : "Firefox",  "doc\_count" : 2  },  {  "key" : "Chrome",  "doc\_count" : 1  },  {  "key" : "IE",  "doc\_count" : 1  }  ]  }  },  {  "key" : "MA",  "doc\_count" : 7,  "agg2" : {  "doc\_count\_error\_upper\_bound" : 0,  "sum\_other\_doc\_count" : 0,  "buckets" : [  {  "key" : "Chrome",  "doc\_count" : 3  },  {  "key" : "Edge",  "doc\_count" : 3  },  {  "key" : "IE",  "doc\_count" : 1  }  ]  }  },  {  "key" : "SJ",  "doc\_count" : 7,  "agg2" : {  "doc\_count\_error\_upper\_bound" : 0,  "sum\_other\_doc\_count" : 0,  "buckets" : [  {  "key" : "IE",  "doc\_count" : 4  },  {  "key" : "Firefox",  "doc\_count" : 3  }  ]  }  },  {  "key" : "AQ",  "doc\_count" : 6,  "agg2" : {  "doc\_count\_error\_upper\_bound" : 0,  "sum\_other\_doc\_count" : 0,  "buckets" : [  {  "key" : "Firefox",  "doc\_count" : 3  },  {  "key" : "Edge",  "doc\_count" : 2  },  {  "key" : "Chrome",  "doc\_count" : 1  }  ]  }  },  {  "key" : "AL",  "doc\_count" : 4,  "agg2" : {  "doc\_count\_error\_upper\_bound" : 0,  "sum\_other\_doc\_count" : 0,  "buckets" : [  {  "key" : "IE",  "doc\_count" : 2  },  {  "key" : "Edge",  "doc\_count" : 1  },  {  "key" : "Firefox",  "doc\_count" : 1  }  ]  }  },  {  "key" : "AD",  "doc\_count" : 3,  "agg2" : {  "doc\_count\_error\_upper\_bound" : 0,  "sum\_other\_doc\_count" : 0,  "buckets" : [  {  "key" : "Edge",  "doc\_count" : 1  },  {  "key" : "Firefox",  "doc\_count" : 1  },  {  "key" : "IE",  "doc\_count" : 1  }  ]  }  },  {  "key" : "AF",  "doc\_count" : 3,  "agg2" : {  "doc\_count\_error\_upper\_bound" : 0,  "sum\_other\_doc\_count" : 0,  "buckets" : [  {  "key" : "Chrome",  "doc\_count" : 1  },  {  "key" : "Edge",  "doc\_count" : 1  },  {  "key" : "IE",  "doc\_count" : 1  }  ]  }  },  {  "key" : "AS",  "doc\_count" : 1,  "agg2" : {  "doc\_count\_error\_upper\_bound" : 0,  "sum\_other\_doc\_count" : 0,  "buckets" : [  {  "key" : "IE",  "doc\_count" : 1  }  ]  }  }  ]  }  }  } |

Show code/JSON of your Q2 and the results of its execution: [10 points]

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|  |

Show results (screenshots) of the profiling of Q1 and Q2 [5] points

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| --- |
| Q1      Q2 |

**Problem 4 [25 Points] visualization of GEO data with Kibana**

Show the new mapping you created for your geo events [10 points]

|  |
| --- |
| PUT hw11\_p4\_index  {  "mappings":{  "properties":{  "logId":{"type": "text"},  "eventTime":{"type": "date"},  "url":{"type": "keyword"},  "us\_country":{"type": "keyword"},  "userId":{"type": "text"},  "browser":{"type": "keyword"},  "ua\_os":{"type": "keyword"},  "responseCode":{"type": "integer"},  "ttfb":{"type": "float"},  "location":{"type": "geo\_point"}  }  }  } |

Show the new index you created and its content [5 points]

|  |
| --- |
| {  "took" : 240,  "timed\_out" : false,  "\_shards" : {  "total" : 1,  "successful" : 1,  "skipped" : 0,  "failed" : 0  },  "hits" : {  "total" : {  "value" : 60,  "relation" : "eq"  },  "max\_score" : 1.0,  "hits" : [  {  "\_index" : "hw11\_p4\_index",  "\_type" : "\_doc",  "\_id" : "0",  "\_score" : 1.0,  "\_source" : {  "logId" : "id0",  "eventTime" : 1574424000000,  "url" : "http://200.com/200",  "userId" : "user10",  "us\_country" : "SJ",  "browser" : "Chrome",  "ua\_os" : "iPhone",  "responseCode" : 335,  "ttfb" : 4.131,  "location" : "77.5536,23.6703"  }  },  {  "\_index" : "hw11\_p4\_index",  "\_type" : "\_doc",  "\_id" : "1",  "\_score" : 1.0,  "\_source" : {  "logId" : "id1",  "eventTime" : 1574424601000,  "url" : "http://200.com/200",  "userId" : "user800",  "us\_country" : "ER",  "browser" : "IE",  "ua\_os" : "Mac",  "responseCode" : 129,  "ttfb" : 10.758,  "location" : "15.1794,39.7823"  }  },  {  "\_index" : "hw11\_p4\_index",  "\_type" : "\_doc",  "\_id" : "2",  "\_score" : 1.0,  "\_source" : {  "logId" : "id2",  "eventTime" : 1574425300000,  "url" : "http://400.com/400",  "userId" : "user55",  "us\_country" : "MA",  "browser" : "IE",  "ua\_os" : "Linux",  "responseCode" : 294,  "ttfb" : 3.942,  "location" : "31.7917,7.0926"  }  },  {  "\_index" : "hw11\_p4\_index",  "\_type" : "\_doc",  "\_id" : "3",  "\_score" : 1.0,  "\_source" : {  "logId" : "id3",  "eventTime" : 1574425911000,  "url" : "http://100.com/100",  "userId" : "user10",  "us\_country" : "ZW",  "browser" : "IE",  "ua\_os" : "Mac",  "responseCode" : 470,  "ttfb" : 3.31,  "location" : "19.0154,29.1549"  }  },  {  "\_index" : "hw11\_p4\_index",  "\_type" : "\_doc",  "\_id" : "4",  "\_score" : 1.0,  "\_source" : {  "logId" : "id4",  "eventTime" : 1574426605000,  "url" : "http://300.com/300",  "userId" : "user10",  "us\_country" : "SJ",  "browser" : "Chrome",  "ua\_os" : "Linux",  "responseCode" : 238,  "ttfb" : 1.081,  "location" : "77.5536,23.6703"  }  },  {  "\_index" : "hw11\_p4\_index",  "\_type" : "\_doc",  "\_id" : "5",  "\_score" : 1.0,  "\_source" : {  "logId" : "id5",  "eventTime" : 1574427255000,  "url" : "http://100.com/100",  "userId" : "user10",  "us\_country" : "SJ",  "browser" : "Chrome",  "ua\_os" : "Linux",  "responseCode" : 177,  "ttfb" : 10.264,  "location" : "77.5536,23.6703"  }  },  {  "\_index" : "hw11\_p4\_index",  "\_type" : "\_doc",  "\_id" : "6",  "\_score" : 1.0,  "\_source" : {  "logId" : "id6",  "eventTime" : 1574427945000,  "url" : "http://300.com/300",  "userId" : "user800",  "us\_country" : "MA",  "browser" : "IE",  "ua\_os" : "Mac",  "responseCode" : 270,  "ttfb" : 5.34,  "location" : "31.7917,7.0926"  }  },  {  "\_index" : "hw11\_p4\_index",  "\_type" : "\_doc",  "\_id" : "7",  "\_score" : 1.0,  "\_source" : {  "logId" : "id7",  "eventTime" : 1574428621000,  "url" : "http://200.com/200",  "userId" : "user9000",  "us\_country" : "ZW",  "browser" : "Edge",  "ua\_os" : "iPhone",  "responseCode" : 239,  "ttfb" : 7.622,  "location" : "19.0154,29.1549"  }  },  {  "\_index" : "hw11\_p4\_index",  "\_type" : "\_doc",  "\_id" : "8",  "\_score" : 1.0,  "\_source" : {  "logId" : "id8",  "eventTime" : 1574429286000,  "url" : "http://400.com/400",  "userId" : "user10",  "us\_country" : "MA",  "browser" : "Chrome",  "ua\_os" : "Mac",  "responseCode" : 300,  "ttfb" : 11.078,  "location" : "31.7917,7.0926"  }  },  {  "\_index" : "hw11\_p4\_index",  "\_type" : "\_doc",  "\_id" : "9",  "\_score" : 1.0,  "\_source" : {  "logId" : "id9",  "eventTime" : 1574429912000,  "url" : "http://400.com/400",  "userId" : "user55",  "us\_country" : "SJ",  "browser" : "Firefox",  "ua\_os" : "Linux",  "responseCode" : 488,  "ttfb" : 5.917,  "location" : "77.5536,23.6703"  }  }  ]  }  } |

Show your Kibana geohash grid with locations where TTFB > 5 seconds: [10 points]

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|  |

**Problem 5: [Bonus: +15 Points] programming with ES APIs**

Enter your well-commented code to index events into ES [5 points]

|  |
| --- |
| import pandas as pd  import numpy as np  import random  from elasticsearch import Elasticsearch  #make data  def generate\_df(id\_list, timestring, min\_interval, max\_interval, url\_list, user\_list, country\_list):  df = pd.DataFrame(id\_list)  df[0] = df[0].astype(str).apply(lambda x: 'id'+x)  #generate incremental time  #time\_list = [pd.Timestamp('2019-11-22T00Z')]  time\_list = [pd.Timestamp(timestring)]  for i in range(1,len(df)):  time\_list.append( time\_list[-1] + pd.Timedelta(seconds=random.randint(min\_interval,max\_interval)) )  df[1] = time\_list  #generate url  df[2] = np.random.choice(url\_list, size=len(df))  #generate user  df[3] = np.random.choice(user\_list, size=len(df))  #generate country  df[4] = np.random.choice(country\_list, size=len(df))  #generate browser  df[5] = np.random.choice(['Chrome','Firefox','Edge','IE'], size=len(df))  #generate OS  df[6] = np.random.choice(['Mac','Linux','iPhone','Windows'], size=len(df))  #generate Response  df[7] = np.random.randint(100,600,size=len(df))  #generate TTFB  df[8] = np.random.uniform(0.1,13,size=len(df))  df[8] = df[8].round(3)    return df  #specify urls, users, countries  url\_list = ['http://100.com/100','http://200.com/200','http://300.com/300',\  'http://400.com/400','http://500.com/500']  user\_list = ['user9000','user800','user10','user77','user55']  country\_list = ['ER','SJ','MA','GD','ZW']  big\_url\_list = url\_list + ['http://google.com/cow','http://bing.com/cat','http://espn.com/ball',\  'http://espn.com/ball','http://amazon.com/fire']  big\_user\_list = user\_list + ['bob','carly','moo','bigbig','buck']  big\_country\_list = country\_list + ['AF','AL','AS','AD','AQ']  #make data with variations in users country urls  timestring = '2019-11-22T12Z'  id\_list = list(range(0,21))  min\_interval = 100  max\_interval = 200  df\_1 = generate\_df(id\_list, timestring, min\_interval, max\_interval, url\_list, user\_list, country\_list)  timestring = '2019-11-22T13Z'  id\_list = list(range(21,51))  min\_interval = 100  max\_interval = 200  df\_2 = generate\_df(id\_list, timestring, min\_interval, max\_interval, big\_url\_list, big\_user\_list, big\_country\_list)  timestring = '2019-11-22T14Z'  id\_list = list(range(51,60))  min\_interval = 100  max\_interval = 200  df\_3 = generate\_df(id\_list, timestring, min\_interval, max\_interval, url\_list, user\_list, country\_list)  df = pd.concat([df\_1,df\_2,df\_3])  df = df.reset\_index(drop = True)  df = df.rename(columns={0: "logId", 1: "eventTime", 2: "url", 3:"userId", 4:"us\_country", 5:"browser", 6:"ua\_os", 7:"responseCode", 8:"ttfb"})  #upload data to ElasticSearch  es = Elasticsearch()  for i in range(len(df)):  res = es.index(index="hw11\_p2b5\_index", doc\_type='\_doc', id=i, body=df.iloc[i].to\_json(orient='index'))  print(res['result']) |

Show execution of your application and a sample of the data inserted into ES [10 points]

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|  |

**Problem 6: [Bonus: +15 Points] Dashboard visualization with Kibana**

Show your Kibana Dashboard with the required elements: [10 points]

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|  |

Show results with a few different time ranges: [5 points]

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