Assignment

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November 21, 2024

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import pandas as pd  
import plotly.express as px  
import plotly.io as pio  
from pyspark.sql import SparkSession  
import re  
import numpy as np  
import plotly.graph\_objects as go  
from pyspark.sql.functions import col, split, explode, regexp\_replace, transform, when  
from pyspark.sql import functions as F  
from pyspark.sql.functions import col, monotonically\_increasing\_id

np.random.seed(2)  
  
pio.renderers.default = "notebook"  
  
# Initialize Spark Session  
spark = SparkSession.builder.appName("LightcastData").getOrCreate()  
  
# Load Data  
df = spark.read.option("header", "true").option("inferSchema", "true").option("multiLine","true").option("escape", "\"").csv("data/lightcast\_job\_postings.csv")  
df.createOrReplaceTempView("job\_postings")  
  
# Show Schema and Sample Data  
#print("---This is Diagnostic check, No need to print it in the final doc---")  
  
#df.printSchema() # comment this line when rendering the submission  
df.show(5)

[Stage 27:> (0 + 1) / 1]

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| ID|LAST\_UPDATED\_DATE|LAST\_UPDATED\_TIMESTAMP|DUPLICATES| POSTED| EXPIRED|DURATION| SOURCE\_TYPES| SOURCES| URL|ACTIVE\_URLS|ACTIVE\_SOURCES\_INFO| TITLE\_RAW| BODY|MODELED\_EXPIRED|MODELED\_DURATION| COMPANY| COMPANY\_NAME|COMPANY\_RAW|COMPANY\_IS\_STAFFING|EDUCATION\_LEVELS|EDUCATION\_LEVELS\_NAME|MIN\_EDULEVELS| MIN\_EDULEVELS\_NAME|MAX\_EDULEVELS|MAX\_EDULEVELS\_NAME|EMPLOYMENT\_TYPE|EMPLOYMENT\_TYPE\_NAME|MIN\_YEARS\_EXPERIENCE|MAX\_YEARS\_EXPERIENCE|IS\_INTERNSHIP|SALARY|REMOTE\_TYPE|REMOTE\_TYPE\_NAME|ORIGINAL\_PAY\_PERIOD|SALARY\_TO|SALARY\_FROM| LOCATION| CITY| CITY\_NAME|COUNTY| COUNTY\_NAME| MSA| MSA\_NAME|STATE|STATE\_NAME|COUNTY\_OUTGOING|COUNTY\_NAME\_OUTGOING|COUNTY\_INCOMING|COUNTY\_NAME\_INCOMING|MSA\_OUTGOING| MSA\_NAME\_OUTGOING|MSA\_INCOMING| MSA\_NAME\_INCOMING|NAICS2| NAICS2\_NAME|NAICS3| NAICS3\_NAME|NAICS4| NAICS4\_NAME|NAICS5| NAICS5\_NAME|NAICS6| NAICS6\_NAME| TITLE| TITLE\_NAME| TITLE\_CLEAN| SKILLS| SKILLS\_NAME| SPECIALIZED\_SKILLS|SPECIALIZED\_SKILLS\_NAME| CERTIFICATIONS| CERTIFICATIONS\_NAME| COMMON\_SKILLS| COMMON\_SKILLS\_NAME| SOFTWARE\_SKILLS|SOFTWARE\_SKILLS\_NAME| ONET| ONET\_NAME| ONET\_2019| ONET\_2019\_NAME| CIP6| CIP6\_NAME| CIP4| CIP4\_NAME| CIP2| CIP2\_NAME|SOC\_2021\_2| SOC\_2021\_2\_NAME|SOC\_2021\_3| SOC\_2021\_3\_NAME|SOC\_2021\_4|SOC\_2021\_4\_NAME|SOC\_2021\_5|SOC\_2021\_5\_NAME|LOT\_CAREER\_AREA|LOT\_CAREER\_AREA\_NAME|LOT\_OCCUPATION| LOT\_OCCUPATION\_NAME|LOT\_SPECIALIZED\_OCCUPATION|LOT\_SPECIALIZED\_OCCUPATION\_NAME|LOT\_OCCUPATION\_GROUP|LOT\_OCCUPATION\_GROUP\_NAME|LOT\_V6\_SPECIALIZED\_OCCUPATION|LOT\_V6\_SPECIALIZED\_OCCUPATION\_NAME|LOT\_V6\_OCCUPATION|LOT\_V6\_OCCUPATION\_NAME|LOT\_V6\_OCCUPATION\_GROUP|LOT\_V6\_OCCUPATION\_GROUP\_NAME|LOT\_V6\_CAREER\_AREA|LOT\_V6\_CAREER\_AREA\_NAME| SOC\_2| SOC\_2\_NAME| SOC\_3| SOC\_3\_NAME| SOC\_4| SOC\_4\_NAME| SOC\_5| SOC\_5\_NAME|LIGHTCAST\_SECTORS|LIGHTCAST\_SECTORS\_NAME|NAICS\_2022\_2| NAICS\_2022\_2\_NAME|NAICS\_2022\_3| NAICS\_2022\_3\_NAME|NAICS\_2022\_4| NAICS\_2022\_4\_NAME|NAICS\_2022\_5| NAICS\_2022\_5\_NAME|NAICS\_2022\_6| NAICS\_2022\_6\_NAME|  
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|1f57d95acf4dc67ed...| 9/6/2024| 2024-09-06 20:32:...| 0|6/2/2024| 6/8/2024| 6| [\n "Company"\n]|[\n "brassring.c...|[\n "https://sjo...| []| NULL|Enterprise Analys...|31-May-2024\n\nEn...| 6/8/2024| 6| 894731| Murphy USA| Murphy USA| false| [\n 2\n]| [\n "Bachelor's ...| 2| Bachelor's degree| NULL| NULL| 1|Full-time (> 32 h...| 2| 2| false| NULL| 0| [None]| NULL| NULL| NULL|{\n "lat": 33.20...|RWwgRG9yYWRvLCBBUg==|El Dorado, AR| 5139| Union, AR|20980| El Dorado, AR| 5| Arkansas| 5139| Union, AR| 5139| Union, AR| 20980| El Dorado, AR| 20980| El Dorado, AR| 44| Retail Trade| 441|Motor Vehicle and...| 4413|Automotive Parts,...| 44133|Automotive Parts ...|441330|Automotive Parts ...|ET29C073C03D1F86B4|Enterprise Analysts|enterprise analys...|[\n "KS126DB6T06...|[\n "Merchandisi...|[\n "KS126DB6T06...| [\n "Merchandisi...| []| []|[\n "KS126706DPF...|[\n "Mathematics...|[\n "KS440W865GC...|[\n "SQL (Progra...|15-2051.01|Business Intellig...|15-2051.01|Business Intellig...|[\n "45.0601",\n...|[\n "Economics, ...|[\n "45.06",\n ...|[\n "Economics",...|[\n "45",\n "27...|[\n "Social Scie...| 15-0000|Computer and Math...| 15-2000|Mathematical Scie...| 15-2050|Data Scientists| 15-2051|Data Scientists| 23|Information Techn...| 231010|Business Intellig...| 23101011| General ERP Analy...| 2310| Business Intellig...| 23101011| General ERP Analy...| 231010| Business Intellig...| 2310| Business Intellig...| 23| Information Techn...|15-0000|Computer and Math...|15-2000|Mathematical Scie...|15-2050|Data Scientists|15-2051|Data Scientists| [\n 7\n]| [\n "Artificial ...| 44| Retail Trade| 441|Motor Vehicle and...| 4413|Automotive Parts,...| 44133|Automotive Parts ...| 441330|Automotive Parts ...|  
|0cb072af26757b6c4...| 8/2/2024| 2024-08-02 17:08:...| 0|6/2/2024| 8/1/2024| NULL| [\n "Job Board"\n]| [\n "maine.gov"\n]|[\n "https://job...| []| NULL|Oracle Consultant...|Oracle Consultant...| 8/1/2024| NULL| 133098|Smx Corporation L...| SMX| true| [\n 99\n]| [\n "No Educatio...| 99|No Education Listed| NULL| NULL| 1|Full-time (> 32 h...| 3| 3| false| NULL| 1| Remote| NULL| NULL| NULL|{\n "lat": 44.31...| QXVndXN0YSwgTUU=| Augusta, ME| 23011| Kennebec, ME|12300|Augusta-Watervill...| 23| Maine| 23011| Kennebec, ME| 23011| Kennebec, ME| 12300|Augusta-Watervill...| 12300|Augusta-Watervill...| 56|Administrative an...| 561|Administrative an...| 5613| Employment Services| 56132|Temporary Help Se...|561320|Temporary Help Se...|ET21DDA63780A7DC09| Oracle Consultants|oracle consultant...|[\n "KS122626T55...|[\n "Procurement...|[\n "KS122626T55...| [\n "Procurement...| []| []| []| []|[\n "BGSBF3F508F...|[\n "Oracle Busi...|15-2051.01|Business Intellig...|15-2051.01|Business Intellig...| []| []| []| []| []| []| 15-0000|Computer and Math...| 15-2000|Mathematical Scie...| 15-2050|Data Scientists| 15-2051|Data Scientists| 23|Information Techn...| 231010|Business Intellig...| 23101012| Oracle Consultant...| 2310| Business Intellig...| 23101012| Oracle Consultant...| 231010| Business Intellig...| 2310| Business Intellig...| 23| Information Techn...|15-0000|Computer and Math...|15-2000|Mathematical Scie...|15-2050|Data Scientists|15-2051|Data Scientists| NULL| NULL| 56|Administrative an...| 561|Administrative an...| 5613| Employment Services| 56132|Temporary Help Se...| 561320|Temporary Help Se...|  
|85318b12b3331fa49...| 9/6/2024| 2024-09-06 20:32:...| 1|6/2/2024| 7/7/2024| 35| [\n "Job Board"\n]|[\n "dejobs.org"\n]|[\n "https://dej...| []| NULL| Data Analyst|Taking care of pe...| 6/10/2024| 8|39063746| Sedgwick| Sedgwick| false| [\n 2\n]| [\n "Bachelor's ...| 2| Bachelor's degree| NULL| NULL| 1|Full-time (> 32 h...| 5| NULL| false| NULL| 0| [None]| NULL| NULL| NULL|{\n "lat": 32.77...| RGFsbGFzLCBUWA==| Dallas, TX| 48113| Dallas, TX|19100|Dallas-Fort Worth...| 48| Texas| 48113| Dallas, TX| 48113| Dallas, TX| 19100|Dallas-Fort Worth...| 19100|Dallas-Fort Worth...| 52|Finance and Insur...| 524|Insurance Carrier...| 5242|Agencies, Brokera...| 52429|Other Insurance R...|524291| Claims Adjusting|ET3037E0C947A02404| Data Analysts| data analyst|[\n "KS1218W78FG...|[\n "Management"...|[\n "ESF3939CE1F...| [\n "Exception R...|[\n "KS683TN76T7...|[\n "Security Cl...|[\n "KS1218W78FG...|[\n "Management"...|[\n "KS126HY6YLT...|[\n "Microsoft O...|15-2051.01|Business Intellig...|15-2051.01|Business Intellig...| []| []| []| []| []| []| 15-0000|Computer and Math...| 15-2000|Mathematical Scie...| 15-2050|Data Scientists| 15-2051|Data Scientists| 23|Information Techn...| 231113|Data / Data Minin...| 23111310| Data Analyst| 2311| Data Analysis and...| 23111310| Data Analyst| 231113| Data / Data Minin...| 2311| Data Analysis and...| 23| Information Techn...|15-0000|Computer and Math...|15-2000|Mathematical Scie...|15-2050|Data Scientists|15-2051|Data Scientists| NULL| NULL| 52|Finance and Insur...| 524|Insurance Carrier...| 5242|Agencies, Brokera...| 52429|Other Insurance R...| 524291| Claims Adjusting|  
|1b5c3941e54a1889e...| 9/6/2024| 2024-09-06 20:32:...| 1|6/2/2024|7/20/2024| 48| [\n "Job Board"\n]|[\n "disabledper...|[\n "https://www...| []| NULL|Sr. Lead Data Mgm...|About this role:\...| 6/12/2024| 10|37615159| Wells Fargo|Wells Fargo| false| [\n 99\n]| [\n "No Educatio...| 99|No Education Listed| NULL| NULL| 1|Full-time (> 32 h...| 3| NULL| false| NULL| 0| [None]| NULL| NULL| NULL|{\n "lat": 33.44...| UGhvZW5peCwgQVo=| Phoenix, AZ| 4013| Maricopa, AZ|38060|Phoenix-Mesa-Chan...| 4| Arizona| 4013| Maricopa, AZ| 4013| Maricopa, AZ| 38060|Phoenix-Mesa-Chan...| 38060|Phoenix-Mesa-Chan...| 52|Finance and Insur...| 522|Credit Intermedia...| 5221|Depository Credit...| 52211| Commercial Banking|522110| Commercial Banking|ET2114E0404BA30075|Management Analysts|sr lead data mgmt...|[\n "KS123QX62QY...|[\n "Exit Strate...|[\n "KS123QX62QY...| [\n "Exit Strate...| []| []|[\n "KS7G6NP6R6L...|[\n "Reliability...|[\n "KS4409D76NW...|[\n "SAS (Softwa...|15-2051.01|Business Intellig...|15-2051.01|Business Intellig...| []| []| []| []| []| []| 15-0000|Computer and Math...| 15-2000|Mathematical Scie...| 15-2050|Data Scientists| 15-2051|Data Scientists| 23|Information Techn...| 231113|Data / Data Minin...| 23111310| Data Analyst| 2311| Data Analysis and...| 23111310| Data Analyst| 231113| Data / Data Minin...| 2311| Data Analysis and...| 23| Information Techn...|15-0000|Computer and Math...|15-2000|Mathematical Scie...|15-2050|Data Scientists|15-2051|Data Scientists| [\n 6\n]| [\n "Data Privac...| 52|Finance and Insur...| 522|Credit Intermedia...| 5221|Depository Credit...| 52211| Commercial Banking| 522110| Commercial Banking|  
|cb5ca25f02bdf25c1...| 6/19/2024| 2024-06-19 07:00:00| 0|6/2/2024|6/17/2024| 15|[\n "FreeJobBoar...|[\n "craigslist....|[\n "https://mod...| []| NULL|Comisiones de $10...|Comisiones de $10...| 6/17/2024| 15| 0| Unclassified| LH/GM| false| [\n 99\n]| [\n "No Educatio...| 99|No Education Listed| NULL| NULL| 3|Part-time / full-...| NULL| NULL| false| 92500| 0| [None]| year| 150000| 35000|{\n "lat": 37.63...| TW9kZXN0bywgQ0E=| Modesto, CA| 6099|Stanislaus, CA|33700| Modesto, CA| 6|California| 6099| Stanislaus, CA| 6099| Stanislaus, CA| 33700| Modesto, CA| 33700| Modesto, CA| 99|Unclassified Indu...| 999|Unclassified Indu...| 9999|Unclassified Indu...| 99999|Unclassified Indu...|999999|Unclassified Indu...|ET0000000000000000| Unclassified|comisiones de por...| []| []| []| []| []| []| []| []| []| []|15-2051.01|Business Intellig...|15-2051.01|Business Intellig...| []| []| []| []| []| []| 15-0000|Computer and Math...| 15-2000|Mathematical Scie...| 15-2050|Data Scientists| 15-2051|Data Scientists| 23|Information Techn...| 231010|Business Intellig...| 23101012| Oracle Consultant...| 2310| Business Intellig...| 23101012| Oracle Consultant...| 231010| Business Intellig...| 2310| Business Intellig...| 23| Information Techn...|15-0000|Computer and Math...|15-2000|Mathematical Scie...|15-2050|Data Scientists|15-2051|Data Scientists| NULL| NULL| 99|Unclassified Indu...| 999|Unclassified Indu...| 9999|Unclassified Indu...| 99999|Unclassified Indu...| 999999|Unclassified Indu...|  
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only showing top 5 rows

df = (  
 df.withColumn("SALARY\_FROM", col("SALARY\_FROM").cast("float"))  
 .withColumn("SALARY\_TO", col("SALARY\_TO").cast("float"))  
 .withColumn("SALARY", col("SALARY").cast("float"))  
 .withColumn("MIN\_YEARS\_EXPERIENCE", col("MIN\_YEARS\_EXPERIENCE").cast("float"))  
 .withColumn("MAX\_YEARS\_EXPERIENCE", col("MAX\_YEARS\_EXPERIENCE").cast("float"))  
)

# define a method  
def compute\_median(sdf,col\_name):  
 q = sdf.approxQuantile(col\_name,[0.5],0.01)  
 return q[0] if q else None

median\_from = compute\_median(df,"SALARY\_FROM")  
median\_to = compute\_median(df, "SALARY\_TO")  
median\_salary = compute\_median(df, "SALARY")  
  
print("medians: ", median\_from, median\_to, median\_salary)

[Stage 29:> (0 + 1) / 1] [Stage 30:> (0 + 1) / 1] [Stage 31:> (0 + 1) / 1]

medians: 87295.0 130042.0 115024.0

df = df.fillna({  
 "SALARY\_FROM": median\_from,  
 "SALARY\_TO": median\_to,  
 "SALARY": median\_salary})

df = df.withColumn("Average Salary",(col("SALARY\_FROM")+col("SALARY\_TO"))/2)

print(df.columns)

['ID', 'LAST\_UPDATED\_DATE', 'LAST\_UPDATED\_TIMESTAMP', 'DUPLICATES', 'POSTED', 'EXPIRED', 'DURATION', 'SOURCE\_TYPES', 'SOURCES', 'URL', 'ACTIVE\_URLS', 'ACTIVE\_SOURCES\_INFO', 'TITLE\_RAW', 'BODY', 'MODELED\_EXPIRED', 'MODELED\_DURATION', 'COMPANY', 'COMPANY\_NAME', 'COMPANY\_RAW', 'COMPANY\_IS\_STAFFING', 'EDUCATION\_LEVELS', 'EDUCATION\_LEVELS\_NAME', 'MIN\_EDULEVELS', 'MIN\_EDULEVELS\_NAME', 'MAX\_EDULEVELS', 'MAX\_EDULEVELS\_NAME', 'EMPLOYMENT\_TYPE', 'EMPLOYMENT\_TYPE\_NAME', 'MIN\_YEARS\_EXPERIENCE', 'MAX\_YEARS\_EXPERIENCE', 'IS\_INTERNSHIP', 'SALARY', 'REMOTE\_TYPE', 'REMOTE\_TYPE\_NAME', 'ORIGINAL\_PAY\_PERIOD', 'SALARY\_TO', 'SALARY\_FROM', 'LOCATION', 'CITY', 'CITY\_NAME', 'COUNTY', 'COUNTY\_NAME', 'MSA', 'MSA\_NAME', 'STATE', 'STATE\_NAME', 'COUNTY\_OUTGOING', 'COUNTY\_NAME\_OUTGOING', 'COUNTY\_INCOMING', 'COUNTY\_NAME\_INCOMING', 'MSA\_OUTGOING', 'MSA\_NAME\_OUTGOING', 'MSA\_INCOMING', 'MSA\_NAME\_INCOMING', 'NAICS2', 'NAICS2\_NAME', 'NAICS3', 'NAICS3\_NAME', 'NAICS4', 'NAICS4\_NAME', 'NAICS5', 'NAICS5\_NAME', 'NAICS6', 'NAICS6\_NAME', 'TITLE', 'TITLE\_NAME', 'TITLE\_CLEAN', 'SKILLS', 'SKILLS\_NAME', 'SPECIALIZED\_SKILLS', 'SPECIALIZED\_SKILLS\_NAME', 'CERTIFICATIONS', 'CERTIFICATIONS\_NAME', 'COMMON\_SKILLS', 'COMMON\_SKILLS\_NAME', 'SOFTWARE\_SKILLS', 'SOFTWARE\_SKILLS\_NAME', 'ONET', 'ONET\_NAME', 'ONET\_2019', 'ONET\_2019\_NAME', 'CIP6', 'CIP6\_NAME', 'CIP4', 'CIP4\_NAME', 'CIP2', 'CIP2\_NAME', 'SOC\_2021\_2', 'SOC\_2021\_2\_NAME', 'SOC\_2021\_3', 'SOC\_2021\_3\_NAME', 'SOC\_2021\_4', 'SOC\_2021\_4\_NAME', 'SOC\_2021\_5', 'SOC\_2021\_5\_NAME', 'LOT\_CAREER\_AREA', 'LOT\_CAREER\_AREA\_NAME', 'LOT\_OCCUPATION', 'LOT\_OCCUPATION\_NAME', 'LOT\_SPECIALIZED\_OCCUPATION', 'LOT\_SPECIALIZED\_OCCUPATION\_NAME', 'LOT\_OCCUPATION\_GROUP', 'LOT\_OCCUPATION\_GROUP\_NAME', 'LOT\_V6\_SPECIALIZED\_OCCUPATION', 'LOT\_V6\_SPECIALIZED\_OCCUPATION\_NAME', 'LOT\_V6\_OCCUPATION', 'LOT\_V6\_OCCUPATION\_NAME', 'LOT\_V6\_OCCUPATION\_GROUP', 'LOT\_V6\_OCCUPATION\_GROUP\_NAME', 'LOT\_V6\_CAREER\_AREA', 'LOT\_V6\_CAREER\_AREA\_NAME', 'SOC\_2', 'SOC\_2\_NAME', 'SOC\_3', 'SOC\_3\_NAME', 'SOC\_4', 'SOC\_4\_NAME', 'SOC\_5', 'SOC\_5\_NAME', 'LIGHTCAST\_SECTORS', 'LIGHTCAST\_SECTORS\_NAME', 'NAICS\_2022\_2', 'NAICS\_2022\_2\_NAME', 'NAICS\_2022\_3', 'NAICS\_2022\_3\_NAME', 'NAICS\_2022\_4', 'NAICS\_2022\_4\_NAME', 'NAICS\_2022\_5', 'NAICS\_2022\_5\_NAME', 'NAICS\_2022\_6', 'NAICS\_2022\_6\_NAME', 'Average Salary']

from pyspark.sql.functions import regexp\_replace, col  
  
df = df.withColumn(  
 "EDUCATION\_LEVELS\_NAME",  
 regexp\_replace(col("EDUCATION\_LEVELS\_NAME"), "[\n\r]", "")   
)

#parse  
export\_cols = [  
 "EDUCATION\_LEVELS\_NAME",  
 "REMOTE\_TYPE\_NAME",  
 "MAX\_YEARS\_EXPERIENCE",  
 "Average Salary",  
 "LOT\_V6\_SPECIALIZED\_OCCUPATION\_NAME"  
]

df\_selected = df.select(export\_cols)  
df\_selected.show(10)

+---------------------+----------------+--------------------+--------------+----------------------------------+  
|EDUCATION\_LEVELS\_NAME|REMOTE\_TYPE\_NAME|MAX\_YEARS\_EXPERIENCE|Average Salary|LOT\_V6\_SPECIALIZED\_OCCUPATION\_NAME|  
+---------------------+----------------+--------------------+--------------+----------------------------------+  
| [ "Bachelor's de...| [None]| 2.0| 108668.5| General ERP Analy...|  
| [ "No Education ...| Remote| 3.0| 108668.5| Oracle Consultant...|  
| [ "Bachelor's de...| [None]| NULL| 108668.5| Data Analyst|  
| [ "No Education ...| [None]| NULL| 108668.5| Data Analyst|  
| [ "No Education ...| [None]| NULL| 92500.0| Oracle Consultant...|  
| [ "Bachelor's de...| Remote| NULL| 110155.0| Data Analyst|  
| [ "Bachelor's de...| [None]| NULL| 108668.5| Data Analyst|  
| [ "Bachelor's de...| [None]| NULL| 108668.5| Data Analyst|  
| [ "No Education ...| [None]| 7.0| 108668.5| General ERP Analy...|  
| [ "Bachelor's de...| [None]| 2.0| 92962.0| Data Analyst|  
+---------------------+----------------+--------------------+--------------+----------------------------------+  
only showing top 10 rows

pdf = df\_selected.toPandas()  
pdf.to\_csv("./data/lighthouse\_cleaned.csv", index=False)  
print(len(pdf))

[Stage 33:> (0 + 1) / 1]

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median\_salaries = pdf.groupby("LOT\_V6\_SPECIALIZED\_OCCUPATION\_NAME")["Average Salary"].median()

sorted\_employment\_types = median\_salaries.sort\_values(ascending=False).index

pdf["LOT\_V6\_SPECIALIZED\_OCCUPATION\_NAME"] = pd.Categorical(  
 pdf["LOT\_V6\_SPECIALIZED\_OCCUPATION\_NAME"],  
 categories=sorted\_employment\_types,  
 ordered=True  
)

fig = px.box(  
 pdf,  
 x="LOT\_V6\_SPECIALIZED\_OCCUPATION\_NAME",  
 y="Average Salary"  
)

fig.show()

Unable to display output for mime type(s): text/html

Unable to display output for mime type(s): text/html

print(df.columns)

['ID', 'LAST\_UPDATED\_DATE', 'LAST\_UPDATED\_TIMESTAMP', 'DUPLICATES', 'POSTED', 'EXPIRED', 'DURATION', 'SOURCE\_TYPES', 'SOURCES', 'URL', 'ACTIVE\_URLS', 'ACTIVE\_SOURCES\_INFO', 'TITLE\_RAW', 'BODY', 'MODELED\_EXPIRED', 'MODELED\_DURATION', 'COMPANY', 'COMPANY\_NAME', 'COMPANY\_RAW', 'COMPANY\_IS\_STAFFING', 'EDUCATION\_LEVELS', 'EDUCATION\_LEVELS\_NAME', 'MIN\_EDULEVELS', 'MIN\_EDULEVELS\_NAME', 'MAX\_EDULEVELS', 'MAX\_EDULEVELS\_NAME', 'EMPLOYMENT\_TYPE', 'EMPLOYMENT\_TYPE\_NAME', 'MIN\_YEARS\_EXPERIENCE', 'MAX\_YEARS\_EXPERIENCE', 'IS\_INTERNSHIP', 'SALARY', 'REMOTE\_TYPE', 'REMOTE\_TYPE\_NAME', 'ORIGINAL\_PAY\_PERIOD', 'SALARY\_TO', 'SALARY\_FROM', 'LOCATION', 'CITY', 'CITY\_NAME', 'COUNTY', 'COUNTY\_NAME', 'MSA', 'MSA\_NAME', 'STATE', 'STATE\_NAME', 'COUNTY\_OUTGOING', 'COUNTY\_NAME\_OUTGOING', 'COUNTY\_INCOMING', 'COUNTY\_NAME\_INCOMING', 'MSA\_OUTGOING', 'MSA\_NAME\_OUTGOING', 'MSA\_INCOMING', 'MSA\_NAME\_INCOMING', 'NAICS2', 'NAICS2\_NAME', 'NAICS3', 'NAICS3\_NAME', 'NAICS4', 'NAICS4\_NAME', 'NAICS5', 'NAICS5\_NAME', 'NAICS6', 'NAICS6\_NAME', 'TITLE', 'TITLE\_NAME', 'TITLE\_CLEAN', 'SKILLS', 'SKILLS\_NAME', 'SPECIALIZED\_SKILLS', 'SPECIALIZED\_SKILLS\_NAME', 'CERTIFICATIONS', 'CERTIFICATIONS\_NAME', 'COMMON\_SKILLS', 'COMMON\_SKILLS\_NAME', 'SOFTWARE\_SKILLS', 'SOFTWARE\_SKILLS\_NAME', 'ONET', 'ONET\_NAME', 'ONET\_2019', 'ONET\_2019\_NAME', 'CIP6', 'CIP6\_NAME', 'CIP4', 'CIP4\_NAME', 'CIP2', 'CIP2\_NAME', 'SOC\_2021\_2', 'SOC\_2021\_2\_NAME', 'SOC\_2021\_3', 'SOC\_2021\_3\_NAME', 'SOC\_2021\_4', 'SOC\_2021\_4\_NAME', 'SOC\_2021\_5', 'SOC\_2021\_5\_NAME', 'LOT\_CAREER\_AREA', 'LOT\_CAREER\_AREA\_NAME', 'LOT\_OCCUPATION', 'LOT\_OCCUPATION\_NAME', 'LOT\_SPECIALIZED\_OCCUPATION', 'LOT\_SPECIALIZED\_OCCUPATION\_NAME', 'LOT\_OCCUPATION\_GROUP', 'LOT\_OCCUPATION\_GROUP\_NAME', 'LOT\_V6\_SPECIALIZED\_OCCUPATION', 'LOT\_V6\_SPECIALIZED\_OCCUPATION\_NAME', 'LOT\_V6\_OCCUPATION', 'LOT\_V6\_OCCUPATION\_NAME', 'LOT\_V6\_OCCUPATION\_GROUP', 'LOT\_V6\_OCCUPATION\_GROUP\_NAME', 'LOT\_V6\_CAREER\_AREA', 'LOT\_V6\_CAREER\_AREA\_NAME', 'SOC\_2', 'SOC\_2\_NAME', 'SOC\_3', 'SOC\_3\_NAME', 'SOC\_4', 'SOC\_4\_NAME', 'SOC\_5', 'SOC\_5\_NAME', 'LIGHTCAST\_SECTORS', 'LIGHTCAST\_SECTORS\_NAME', 'NAICS\_2022\_2', 'NAICS\_2022\_2\_NAME', 'NAICS\_2022\_3', 'NAICS\_2022\_3\_NAME', 'NAICS\_2022\_4', 'NAICS\_2022\_4\_NAME', 'NAICS\_2022\_5', 'NAICS\_2022\_5\_NAME', 'NAICS\_2022\_6', 'NAICS\_2022\_6\_NAME', 'Average Salary']

from pyspark.sql.functions import lit  
  
df = df.withColumn("counter", lit(1))

#parse  
export\_cols2 = [  
 "LOT\_V6\_SPECIALIZED\_OCCUPATION\_NAME",  
 "Average Salary",  
 "counter"  
]

df\_selected2 = df.select(export\_cols2)  
df\_selected2.show(40)

+----------------------------------+--------------+-------+  
|LOT\_V6\_SPECIALIZED\_OCCUPATION\_NAME|Average Salary|counter|  
+----------------------------------+--------------+-------+  
| General ERP Analy...| 108668.5| 1|  
| Oracle Consultant...| 108668.5| 1|  
| Data Analyst| 108668.5| 1|  
| Data Analyst| 108668.5| 1|  
| Oracle Consultant...| 92500.0| 1|  
| Data Analyst| 110155.0| 1|  
| Data Analyst| 108668.5| 1|  
| Data Analyst| 108668.5| 1|  
| General ERP Analy...| 108668.5| 1|  
| Data Analyst| 92962.0| 1|  
| Data Analyst| 107645.5| 1|  
| Data Analyst| 108668.5| 1|  
| Data Analyst| 108668.5| 1|  
| General ERP Analy...| 192800.0| 1|  
| Enterprise Architect| 81286.0| 1|  
| Data Analyst| 108668.5| 1|  
| General ERP Analy...| 125900.0| 1|  
| Oracle Consultant...| 108668.5| 1|  
| Enterprise Architect| 165000.0| 1|  
| Data Analyst| 170000.0| 1|  
| Data Analyst| 110155.0| 1|  
| Enterprise Architect| 136950.0| 1|  
| Data Analyst| 118560.0| 1|  
| Enterprise Architect| 108668.5| 1|  
| Business Analyst ...| 108668.5| 1|  
| Data Analyst| 108668.5| 1|  
| Enterprise Architect| 79000.0| 1|  
| SAP Analyst / Admin| 41600.0| 1|  
| Business Intellig...| 108668.5| 1|  
| Data Analyst| 108668.5| 1|  
| Data Analyst| 140756.5| 1|  
| General ERP Analy...| 192800.0| 1|  
| Oracle Consultant...| 75026.0| 1|  
| General ERP Analy...| 116500.0| 1|  
| Oracle Consultant...| 166500.0| 1|  
| Oracle Consultant...| 108668.5| 1|  
| Business Analyst ...| 108668.5| 1|  
| Data Analyst| 42500.0| 1|  
| Data Analyst| 156038.5| 1|  
| Data Analyst| 108668.5| 1|  
+----------------------------------+--------------+-------+  
only showing top 40 rows

pdf2 = df\_selected2.toPandas()  
#pdf2.to\_csv("./data/lighthouse\_cleaned.csv", index=False)  
#print(len(pdf2))  
pdf2.head(30)

[Stage 35:> (0 + 1) / 1]

|  | LOT\_V6\_SPECIALIZED\_OCCUPATION\_NAME | Average Salary | counter |
| --- | --- | --- | --- |
| 0 | General ERP Analyst / Consultant | 108668.5 | 1 |
| 1 | Oracle Consultant / Analyst | 108668.5 | 1 |
| 2 | Data Analyst | 108668.5 | 1 |
| 3 | Data Analyst | 108668.5 | 1 |
| 4 | Oracle Consultant / Analyst | 92500.0 | 1 |
| 5 | Data Analyst | 110155.0 | 1 |
| 6 | Data Analyst | 108668.5 | 1 |
| 7 | Data Analyst | 108668.5 | 1 |
| 8 | General ERP Analyst / Consultant | 108668.5 | 1 |
| 9 | Data Analyst | 92962.0 | 1 |
| 10 | Data Analyst | 107645.5 | 1 |
| 11 | Data Analyst | 108668.5 | 1 |
| 12 | Data Analyst | 108668.5 | 1 |
| 13 | General ERP Analyst / Consultant | 192800.0 | 1 |
| 14 | Enterprise Architect | 81286.0 | 1 |
| 15 | Data Analyst | 108668.5 | 1 |
| 16 | General ERP Analyst / Consultant | 125900.0 | 1 |
| 17 | Oracle Consultant / Analyst | 108668.5 | 1 |
| 18 | Enterprise Architect | 165000.0 | 1 |
| 19 | Data Analyst | 170000.0 | 1 |
| 20 | Data Analyst | 110155.0 | 1 |
| 21 | Enterprise Architect | 136950.0 | 1 |
| 22 | Data Analyst | 118560.0 | 1 |
| 23 | Enterprise Architect | 108668.5 | 1 |
| 24 | Business Analyst (General) | 108668.5 | 1 |
| 25 | Data Analyst | 108668.5 | 1 |
| 26 | Enterprise Architect | 79000.0 | 1 |
| 27 | SAP Analyst / Admin | 41600.0 | 1 |
| 28 | Business Intelligence Analyst | 108668.5 | 1 |
| 29 | Data Analyst | 108668.5 | 1 |

median\_salaries2 = pdf2.groupby("LOT\_V6\_SPECIALIZED\_OCCUPATION\_NAME").agg({  
 "Average Salary": "median",  
 "counter": "sum"  
}).reset\_index()

#sorted\_employment\_types2 = median\_salaries2.sort\_values(ascending=False).index  
median\_salaries2.head()

|  | LOT\_V6\_SPECIALIZED\_OCCUPATION\_NAME | Average Salary | counter |
| --- | --- | --- | --- |
| 0 | Business Analyst (General) | 108668.5 | 4326 |
| 1 | Business Intelligence Analyst | 108668.5 | 3639 |
| 2 | Data Analyst | 108668.5 | 27832 |
| 3 | Data Quality Analyst | 108668.5 | 1070 |
| 4 | Enterprise Architect | 108668.5 | 8212 |

fig2 = px.scatter(  
 median\_salaries2,  
 x="LOT\_V6\_SPECIALIZED\_OCCUPATION\_NAME",  
 y="Average Salary",  
 size="counter",  
 hover\_name="LOT\_V6\_SPECIALIZED\_OCCUPATION\_NAME",   
 size\_max=60   
)  
  
fig2.update\_layout(  
 xaxis\_title="Occupation",  
 yaxis\_title="Median Salary",  
 title="Bubble Chart of Jobs: Median Salary vs. Occupation (Bubble = # Postings)",  
 xaxis\_tickangle=45 # rotate labels if long  
)

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df = df.withColumn(  
 "education\_group",  
 F.when(F.col("MIN\_EDULEVELS\_NAME").isin("GED", "Associate", "No Education Listed"), "Associate's or lower")  
 .when(F.col("MIN\_EDULEVELS\_NAME") == "Bachelor's degree", "Bachelor's")  
 .when(F.col("MIN\_EDULEVELS\_NAME").isin("Master's degree"), "Master's")  
 .when(F.col("MIN\_EDULEVELS\_NAME").isin("PhD", "Doctorate", "professional degree"), "PhD")  
 .otherwise("Other") # optional catch-all for unexpected values  
)  
  
df.show()

+--------------------+-----------------+----------------------+----------+--------+---------+--------+--------------------+--------------------+--------------------+-----------+-------------------+--------------------+--------------------+---------------+----------------+---------+--------------------+--------------------+-------------------+--------------------+---------------------+-------------+-------------------+-------------+------------------+---------------+--------------------+--------------------+--------------------+-------------+--------+-----------+----------------+-------------------+---------+-----------+--------------------+--------------------+------------------+------+--------------------+-----+--------------------+-----+-------------+---------------+--------------------+---------------+--------------------+------------+--------------------+------------+--------------------+------+--------------------+------+--------------------+------+--------------------+------+--------------------+------+--------------------+------------------+--------------------+--------------------+--------------------+--------------------+--------------------+-----------------------+--------------------+--------------------+--------------------+--------------------+--------------------+--------------------+----------+--------------------+----------+--------------------+--------------------+--------------------+--------------------+--------------------+--------------------+--------------------+----------+--------------------+----------+--------------------+----------+---------------+----------+---------------+---------------+--------------------+--------------+--------------------+--------------------------+-------------------------------+--------------------+-------------------------+-----------------------------+----------------------------------+-----------------+----------------------+-----------------------+----------------------------+------------------+-----------------------+-------+--------------------+-------+--------------------+-------+---------------+-------+---------------+-----------------+----------------------+------------+--------------------+------------+--------------------+------------+--------------------+------------+--------------------+------------+--------------------+--------------+-------+--------------------+  
| ID|LAST\_UPDATED\_DATE|LAST\_UPDATED\_TIMESTAMP|DUPLICATES| POSTED| EXPIRED|DURATION| SOURCE\_TYPES| SOURCES| URL|ACTIVE\_URLS|ACTIVE\_SOURCES\_INFO| TITLE\_RAW| BODY|MODELED\_EXPIRED|MODELED\_DURATION| COMPANY| COMPANY\_NAME| COMPANY\_RAW|COMPANY\_IS\_STAFFING| EDUCATION\_LEVELS|EDUCATION\_LEVELS\_NAME|MIN\_EDULEVELS| MIN\_EDULEVELS\_NAME|MAX\_EDULEVELS|MAX\_EDULEVELS\_NAME|EMPLOYMENT\_TYPE|EMPLOYMENT\_TYPE\_NAME|MIN\_YEARS\_EXPERIENCE|MAX\_YEARS\_EXPERIENCE|IS\_INTERNSHIP| SALARY|REMOTE\_TYPE|REMOTE\_TYPE\_NAME|ORIGINAL\_PAY\_PERIOD|SALARY\_TO|SALARY\_FROM| LOCATION| CITY| CITY\_NAME|COUNTY| COUNTY\_NAME| MSA| MSA\_NAME|STATE| STATE\_NAME|COUNTY\_OUTGOING|COUNTY\_NAME\_OUTGOING|COUNTY\_INCOMING|COUNTY\_NAME\_INCOMING|MSA\_OUTGOING| MSA\_NAME\_OUTGOING|MSA\_INCOMING| MSA\_NAME\_INCOMING|NAICS2| NAICS2\_NAME|NAICS3| NAICS3\_NAME|NAICS4| NAICS4\_NAME|NAICS5| NAICS5\_NAME|NAICS6| NAICS6\_NAME| TITLE| TITLE\_NAME| TITLE\_CLEAN| SKILLS| SKILLS\_NAME| SPECIALIZED\_SKILLS|SPECIALIZED\_SKILLS\_NAME| CERTIFICATIONS| CERTIFICATIONS\_NAME| COMMON\_SKILLS| COMMON\_SKILLS\_NAME| SOFTWARE\_SKILLS|SOFTWARE\_SKILLS\_NAME| ONET| ONET\_NAME| ONET\_2019| ONET\_2019\_NAME| CIP6| CIP6\_NAME| CIP4| CIP4\_NAME| CIP2| CIP2\_NAME|SOC\_2021\_2| SOC\_2021\_2\_NAME|SOC\_2021\_3| SOC\_2021\_3\_NAME|SOC\_2021\_4|SOC\_2021\_4\_NAME|SOC\_2021\_5|SOC\_2021\_5\_NAME|LOT\_CAREER\_AREA|LOT\_CAREER\_AREA\_NAME|LOT\_OCCUPATION| LOT\_OCCUPATION\_NAME|LOT\_SPECIALIZED\_OCCUPATION|LOT\_SPECIALIZED\_OCCUPATION\_NAME|LOT\_OCCUPATION\_GROUP|LOT\_OCCUPATION\_GROUP\_NAME|LOT\_V6\_SPECIALIZED\_OCCUPATION|LOT\_V6\_SPECIALIZED\_OCCUPATION\_NAME|LOT\_V6\_OCCUPATION|LOT\_V6\_OCCUPATION\_NAME|LOT\_V6\_OCCUPATION\_GROUP|LOT\_V6\_OCCUPATION\_GROUP\_NAME|LOT\_V6\_CAREER\_AREA|LOT\_V6\_CAREER\_AREA\_NAME| SOC\_2| SOC\_2\_NAME| SOC\_3| SOC\_3\_NAME| SOC\_4| SOC\_4\_NAME| SOC\_5| SOC\_5\_NAME|LIGHTCAST\_SECTORS|LIGHTCAST\_SECTORS\_NAME|NAICS\_2022\_2| NAICS\_2022\_2\_NAME|NAICS\_2022\_3| NAICS\_2022\_3\_NAME|NAICS\_2022\_4| NAICS\_2022\_4\_NAME|NAICS\_2022\_5| NAICS\_2022\_5\_NAME|NAICS\_2022\_6| NAICS\_2022\_6\_NAME|Average Salary|counter| education\_group|  
+--------------------+-----------------+----------------------+----------+--------+---------+--------+--------------------+--------------------+--------------------+-----------+-------------------+--------------------+--------------------+---------------+----------------+---------+--------------------+--------------------+-------------------+--------------------+---------------------+-------------+-------------------+-------------+------------------+---------------+--------------------+--------------------+--------------------+-------------+--------+-----------+----------------+-------------------+---------+-----------+--------------------+--------------------+------------------+------+--------------------+-----+--------------------+-----+-------------+---------------+--------------------+---------------+--------------------+------------+--------------------+------------+--------------------+------+--------------------+------+--------------------+------+--------------------+------+--------------------+------+--------------------+------------------+--------------------+--------------------+--------------------+--------------------+--------------------+-----------------------+--------------------+--------------------+--------------------+--------------------+--------------------+--------------------+----------+--------------------+----------+--------------------+--------------------+--------------------+--------------------+--------------------+--------------------+--------------------+----------+--------------------+----------+--------------------+----------+---------------+----------+---------------+---------------+--------------------+--------------+--------------------+--------------------------+-------------------------------+--------------------+-------------------------+-----------------------------+----------------------------------+-----------------+----------------------+-----------------------+----------------------------+------------------+-----------------------+-------+--------------------+-------+--------------------+-------+---------------+-------+---------------+-----------------+----------------------+------------+--------------------+------------+--------------------+------------+--------------------+------------+--------------------+------------+--------------------+--------------+-------+--------------------+  
|1f57d95acf4dc67ed...| 9/6/2024| 2024-09-06 20:32:...| 0|6/2/2024| 6/8/2024| 6| [\n "Company"\n]|[\n "brassring.c...|[\n "https://sjo...| []| NULL|Enterprise Analys...|31-May-2024\n\nEn...| 6/8/2024| 6| 894731| Murphy USA| Murphy USA| false| [\n 2\n]| [ "Bachelor's de...| 2| Bachelor's degree| NULL| NULL| 1|Full-time (> 32 h...| 2.0| 2.0| false|115024.0| 0| [None]| NULL| 130042.0| 87295.0|{\n "lat": 33.20...|RWwgRG9yYWRvLCBBUg==| El Dorado, AR| 5139| Union, AR|20980| El Dorado, AR| 5| Arkansas| 5139| Union, AR| 5139| Union, AR| 20980| El Dorado, AR| 20980| El Dorado, AR| 44| Retail Trade| 441|Motor Vehicle and...| 4413|Automotive Parts,...| 44133|Automotive Parts ...|441330|Automotive Parts ...|ET29C073C03D1F86B4| Enterprise Analysts|enterprise analys...|[\n "KS126DB6T06...|[\n "Merchandisi...|[\n "KS126DB6T06...| [\n "Merchandisi...| []| []|[\n "KS126706DPF...|[\n "Mathematics...|[\n "KS440W865GC...|[\n "SQL (Progra...|15-2051.01|Business Intellig...|15-2051.01|Business Intellig...|[\n "45.0601",\n...|[\n "Economics, ...|[\n "45.06",\n ...|[\n "Economics",...|[\n "45",\n "27...|[\n "Social Scie...| 15-0000|Computer and Math...| 15-2000|Mathematical Scie...| 15-2050|Data Scientists| 15-2051|Data Scientists| 23|Information Techn...| 231010|Business Intellig...| 23101011| General ERP Analy...| 2310| Business Intellig...| 23101011| General ERP Analy...| 231010| Business Intellig...| 2310| Business Intellig...| 23| Information Techn...|15-0000|Computer and Math...|15-2000|Mathematical Scie...|15-2050|Data Scientists|15-2051|Data Scientists| [\n 7\n]| [\n "Artificial ...| 44| Retail Trade| 441|Motor Vehicle and...| 4413|Automotive Parts,...| 44133|Automotive Parts ...| 441330|Automotive Parts ...| 108668.5| 1| Bachelor's|  
|0cb072af26757b6c4...| 8/2/2024| 2024-08-02 17:08:...| 0|6/2/2024| 8/1/2024| NULL| [\n "Job Board"\n]| [\n "maine.gov"\n]|[\n "https://job...| []| NULL|Oracle Consultant...|Oracle Consultant...| 8/1/2024| NULL| 133098|Smx Corporation L...| SMX| true| [\n 99\n]| [ "No Education ...| 99|No Education Listed| NULL| NULL| 1|Full-time (> 32 h...| 3.0| 3.0| false|115024.0| 1| Remote| NULL| 130042.0| 87295.0|{\n "lat": 44.31...| QXVndXN0YSwgTUU=| Augusta, ME| 23011| Kennebec, ME|12300|Augusta-Watervill...| 23| Maine| 23011| Kennebec, ME| 23011| Kennebec, ME| 12300|Augusta-Watervill...| 12300|Augusta-Watervill...| 56|Administrative an...| 561|Administrative an...| 5613| Employment Services| 56132|Temporary Help Se...|561320|Temporary Help Se...|ET21DDA63780A7DC09| Oracle Consultants|oracle consultant...|[\n "KS122626T55...|[\n "Procurement...|[\n "KS122626T55...| [\n "Procurement...| []| []| []| []|[\n "BGSBF3F508F...|[\n "Oracle Busi...|15-2051.01|Business Intellig...|15-2051.01|Business Intellig...| []| []| []| []| []| []| 15-0000|Computer and Math...| 15-2000|Mathematical Scie...| 15-2050|Data Scientists| 15-2051|Data Scientists| 23|Information Techn...| 231010|Business Intellig...| 23101012| Oracle Consultant...| 2310| Business Intellig...| 23101012| Oracle Consultant...| 231010| Business Intellig...| 2310| Business Intellig...| 23| Information Techn...|15-0000|Computer and Math...|15-2000|Mathematical Scie...|15-2050|Data Scientists|15-2051|Data Scientists| NULL| NULL| 56|Administrative an...| 561|Administrative an...| 5613| Employment Services| 56132|Temporary Help Se...| 561320|Temporary Help Se...| 108668.5| 1|Associate's or lower|  
|85318b12b3331fa49...| 9/6/2024| 2024-09-06 20:32:...| 1|6/2/2024| 7/7/2024| 35| [\n "Job Board"\n]|[\n "dejobs.org"\n]|[\n "https://dej...| []| NULL| Data Analyst|Taking care of pe...| 6/10/2024| 8| 39063746| Sedgwick| Sedgwick| false| [\n 2\n]| [ "Bachelor's de...| 2| Bachelor's degree| NULL| NULL| 1|Full-time (> 32 h...| 5.0| NULL| false|115024.0| 0| [None]| NULL| 130042.0| 87295.0|{\n "lat": 32.77...| RGFsbGFzLCBUWA==| Dallas, TX| 48113| Dallas, TX|19100|Dallas-Fort Worth...| 48| Texas| 48113| Dallas, TX| 48113| Dallas, TX| 19100|Dallas-Fort Worth...| 19100|Dallas-Fort Worth...| 52|Finance and Insur...| 524|Insurance Carrier...| 5242|Agencies, Brokera...| 52429|Other Insurance R...|524291| Claims Adjusting|ET3037E0C947A02404| Data Analysts| data analyst|[\n "KS1218W78FG...|[\n "Management"...|[\n "ESF3939CE1F...| [\n "Exception R...|[\n "KS683TN76T7...|[\n "Security Cl...|[\n "KS1218W78FG...|[\n "Management"...|[\n "KS126HY6YLT...|[\n "Microsoft O...|15-2051.01|Business Intellig...|15-2051.01|Business Intellig...| []| []| []| []| []| []| 15-0000|Computer and Math...| 15-2000|Mathematical Scie...| 15-2050|Data Scientists| 15-2051|Data Scientists| 23|Information Techn...| 231113|Data / Data Minin...| 23111310| Data Analyst| 2311| Data Analysis and...| 23111310| Data Analyst| 231113| Data / Data Minin...| 2311| Data Analysis and...| 23| Information Techn...|15-0000|Computer and Math...|15-2000|Mathematical Scie...|15-2050|Data Scientists|15-2051|Data Scientists| NULL| NULL| 52|Finance and Insur...| 524|Insurance Carrier...| 5242|Agencies, Brokera...| 52429|Other Insurance R...| 524291| Claims Adjusting| 108668.5| 1| Bachelor's|  
|1b5c3941e54a1889e...| 9/6/2024| 2024-09-06 20:32:...| 1|6/2/2024|7/20/2024| 48| [\n "Job Board"\n]|[\n "disabledper...|[\n "https://www...| []| NULL|Sr. Lead Data Mgm...|About this role:\...| 6/12/2024| 10| 37615159| Wells Fargo| Wells Fargo| false| [\n 99\n]| [ "No Education ...| 99|No Education Listed| NULL| NULL| 1|Full-time (> 32 h...| 3.0| NULL| false|115024.0| 0| [None]| NULL| 130042.0| 87295.0|{\n "lat": 33.44...| UGhvZW5peCwgQVo=| Phoenix, AZ| 4013| Maricopa, AZ|38060|Phoenix-Mesa-Chan...| 4| Arizona| 4013| Maricopa, AZ| 4013| Maricopa, AZ| 38060|Phoenix-Mesa-Chan...| 38060|Phoenix-Mesa-Chan...| 52|Finance and Insur...| 522|Credit Intermedia...| 5221|Depository Credit...| 52211| Commercial Banking|522110| Commercial Banking|ET2114E0404BA30075| Management Analysts|sr lead data mgmt...|[\n "KS123QX62QY...|[\n "Exit Strate...|[\n "KS123QX62QY...| [\n "Exit Strate...| []| []|[\n "KS7G6NP6R6L...|[\n "Reliability...|[\n "KS4409D76NW...|[\n "SAS (Softwa...|15-2051.01|Business Intellig...|15-2051.01|Business Intellig...| []| []| []| []| []| []| 15-0000|Computer and Math...| 15-2000|Mathematical Scie...| 15-2050|Data Scientists| 15-2051|Data Scientists| 23|Information Techn...| 231113|Data / Data Minin...| 23111310| Data Analyst| 2311| Data Analysis and...| 23111310| Data Analyst| 231113| Data / Data Minin...| 2311| Data Analysis and...| 23| Information Techn...|15-0000|Computer and Math...|15-2000|Mathematical Scie...|15-2050|Data Scientists|15-2051|Data Scientists| [\n 6\n]| [\n "Data Privac...| 52|Finance and Insur...| 522|Credit Intermedia...| 5221|Depository Credit...| 52211| Commercial Banking| 522110| Commercial Banking| 108668.5| 1|Associate's or lower|  
|cb5ca25f02bdf25c1...| 6/19/2024| 2024-06-19 07:00:00| 0|6/2/2024|6/17/2024| 15|[\n "FreeJobBoar...|[\n "craigslist....|[\n "https://mod...| []| NULL|Comisiones de $10...|Comisiones de $10...| 6/17/2024| 15| 0| Unclassified| LH/GM| false| [\n 99\n]| [ "No Education ...| 99|No Education Listed| NULL| NULL| 3|Part-time / full-...| NULL| NULL| false| 92500.0| 0| [None]| year| 150000.0| 35000.0|{\n "lat": 37.63...| TW9kZXN0bywgQ0E=| Modesto, CA| 6099| Stanislaus, CA|33700| Modesto, CA| 6| California| 6099| Stanislaus, CA| 6099| Stanislaus, CA| 33700| Modesto, CA| 33700| Modesto, CA| 99|Unclassified Indu...| 999|Unclassified Indu...| 9999|Unclassified Indu...| 99999|Unclassified Indu...|999999|Unclassified Indu...|ET0000000000000000| Unclassified|comisiones de por...| []| []| []| []| []| []| []| []| []| []|15-2051.01|Business Intellig...|15-2051.01|Business Intellig...| []| []| []| []| []| []| 15-0000|Computer and Math...| 15-2000|Mathematical Scie...| 15-2050|Data Scientists| 15-2051|Data Scientists| 23|Information Techn...| 231010|Business Intellig...| 23101012| Oracle Consultant...| 2310| Business Intellig...| 23101012| Oracle Consultant...| 231010| Business Intellig...| 2310| Business Intellig...| 23| Information Techn...|15-0000|Computer and Math...|15-2000|Mathematical Scie...|15-2050|Data Scientists|15-2051|Data Scientists| NULL| NULL| 99|Unclassified Indu...| 999|Unclassified Indu...| 9999|Unclassified Indu...| 99999|Unclassified Indu...| 999999|Unclassified Indu...| 92500.0| 1|Associate's or lower|  
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|138ce2c9453b47a9b...| 8/10/2024| 2024-08-10 19:36:...| 5|6/2/2024| 8/9/2024| NULL|[\n "Job Board",...|[\n "silkroad.co...|[\n "https://mai...| []| NULL|SENIOR CONSULTANT...|SENIOR CONSULTANT...| 6/8/2024| 6| 1967| Boston University| Boston University| false|[\n 1,\n 2,\n ...| [ "Associate deg...| 1| Associate degree| 3| Master's degree| 1|Full-time (> 32 h...| 5.0| 5.0| false|115024.0| 1| Remote| NULL| 130042.0| 87295.0|{\n "lat": 42.36...| Qm9zdG9uLCBNQQ==| Boston, MA| 25025| Suffolk, MA|14460|Boston-Cambridge-...| 25|Massachusetts| 25025| Suffolk, MA| 25025| Suffolk, MA| 14460|Boston-Cambridge-...| 14460|Boston-Cambridge-...| 61|Educational Services| 611|Educational Services| 6113|Colleges, Univers...| 61131|Colleges, Univers...|611310|Colleges, Univers...|ET210B837B93B7B3F9|Continuous Improv...|senior consultant...|[\n "ESB38820A54...|[\n "Effective C...|[\n "ESB38820A54...| [\n "Effective C...|[\n "KS7G2ZG794H...|[\n "Certified I...|[\n "KS1280B68GD...|[\n "Presentatio...| []| []|15-2051.01|Business Intellig...|15-2051.01|Business Intellig...| [\n "52.0201"\n]|[\n "Business Ad...| [\n "52.02"\n]|[\n "Business Ad...| [\n "52"\n]|[\n "Business, M...| 15-0000|Computer and Math...| 15-2000|Mathematical Scie...| 15-2050|Data Scientists| 15-2051|Data Scientists| 23|Information Techn...| 231113|Data / Data Minin...| 23111310| Data Analyst| 2311| Data Analysis and...| 23111310| Data Analyst| 231113| Data / Data Minin...| 2311| Data Analysis and...| 23| Information Techn...|15-0000|Computer and Math...|15-2000|Mathematical Scie...|15-2050|Data Scientists|15-2051|Data Scientists| NULL| NULL| 61|Educational Services| 611|Educational Services| 6113|Colleges, Univers...| 61131|Colleges, Univers...| 611310|Colleges, Univers...| 108668.5| 1| Other|  
|dd191e2ce3062c371...| 9/6/2024| 2024-09-06 20:32:...| 0|6/2/2024|6/20/2024| 18| [\n "Job Board"\n]|[\n "phoenixrecr...|[\n "https://www...| []| NULL| SAP FSCM Consultant|Job Description: ...| 6/20/2024| 18| 8592955| Accenture| Accenture| false| [\n 1,\n 2\n]| [ "Associate deg...| 1| Associate degree| 2| Bachelor's degree| 1|Full-time (> 32 h...| 12.0| NULL| false|125900.0| 0| [None]| year| 188600.0| 63200.0|{\n "lat": 0,\n ...|W1Vua25vd24gQ2l0e...|[Unknown City], AZ| 4999|[Unknown county], AZ| NULL| NULL| 4| Arizona| 4999|[Unknown county], AZ| 4999|[Unknown county], AZ| NULL| NULL| NULL| NULL| 54|Professional, Sci...| 541|Professional, Sci...| 5415|Computer Systems ...| 54151|Computer Systems ...|541512|Computer Systems ...|ETF594A2C05D212506|Peoplesoft FSCM C...| sap fscm consultant|[\n "KS7G7VL78R2...|[\n "Profit Cent...|[\n "KS7G7VL78R2...| [\n "Profit Cent...| []| []|[\n "KS122ZF75YV...|[\n "Digitizatio...|[\n "KS7G7VL78R2...|[\n "Profit Cent...|15-2051.01|Business Intellig...|15-2051.01|Business Intellig...| []| []| []| []| []| []| 15-0000|Computer and Math...| 15-2000|Mathematical Scie...| 15-2050|Data Scientists| 15-2051|Data Scientists| 23|Information Techn...| 231010|Business Intellig...| 23101011| General ERP Analy...| 2310| Business Intellig...| 23101011| General ERP Analy...| 231010| Business Intellig...| 2310| Business Intellig...| 23| Information Techn...|15-0000|Computer and Math...|15-2000|Mathematical Scie...|15-2050|Data Scientists|15-2051|Data Scientists| NULL| NULL| 54|Professional, Sci...| 541|Professional, Sci...| 5415|Computer Systems ...| 54151|Computer Systems ...| 541512|Computer Systems ...| 125900.0| 1| Other|  
|99856b5a8a1c75d90...| 9/6/2024| 2024-09-06 20:32:...| 0|6/2/2024| 8/1/2024| NULL|[\n "Government"\n]|[\n "alaska.gov"\n]|[\n "https://ala...| []| NULL|Oracle Consultant...|Onsite - Work ons...| 7/10/2024| 38| 133098|Smx Corporation L...| SMX| true| [\n 99\n]| [ "No Education ...| 99|No Education Listed| NULL| NULL| 1|Full-time (> 32 h...| 3.0| 3.0| false|115024.0| 1| Remote| NULL| 130042.0| 87295.0|{\n "lat": 58.30...| SnVuZWF1LCBBSw==| Juneau, AK| 2110| Juneau Borough, AK|27940| Juneau, AK| 2| Alaska| 2110| Juneau Borough, AK| 2110| Juneau Borough, AK| 27940| Juneau, AK| 27940| Juneau, AK| 56|Administrative an...| 561|Administrative an...| 5613| Employment Services| 56132|Temporary Help Se...|561320|Temporary Help Se...|ET21DDA63780A7DC09| Oracle Consultants|oracle consultant...|[\n "KS122626T55...|[\n "Procurement...|[\n "KS122626T55...| [\n "Procurement...| []| []| []| []|[\n "BGSBF3F508F...|[\n "Oracle Busi...|15-2051.01|Business Intellig...|15-2051.01|Business Intellig...| []| []| []| []| []| []| 15-0000|Computer and Math...| 15-2000|Mathematical Scie...| 15-2050|Data Scientists| 15-2051|Data Scientists| 23|Information Techn...| 231010|Business Intellig...| 23101012| Oracle Consultant...| 2310| Business Intellig...| 23101012| Oracle Consultant...| 231010| Business Intellig...| 2310| Business Intellig...| 23| Information Techn...|15-0000|Computer and Math...|15-2000|Mathematical Scie...|15-2050|Data Scientists|15-2051|Data Scientists| NULL| NULL| 56|Administrative an...| 561|Administrative an...| 5613| Employment Services| 56132|Temporary Help Se...| 561320|Temporary Help Se...| 108668.5| 1|Associate's or lower|  
|f28123528a32b8c9b...| 9/6/2024| 2024-09-06 20:32:...| 0|6/2/2024| 8/1/2024| NULL| [\n "Company"\n]|[\n "sca.health"\n]|[\n "https://car...| []| NULL| Principal Architect|Principal Archite...| 8/1/2024| NULL| 39192167|Surgical Care Aff...|Surgical Care Aff...| false| [\n 2\n]| [ "Bachelor's de...| 2| Bachelor's degree| NULL| NULL| 1|Full-time (> 32 h...| 8.0| 8.0| false|115024.0| 0| [None]| year| 170000.0| 160000.0|{\n "lat": 33.51...|QmlybWluZ2hhbSwgQUw=| Birmingham, AL| 1073| Jefferson, AL|13820|Birmingham-Hoover...| 1| Alabama| 1073| Jefferson, AL| 1073| Jefferson, AL| 13820|Birmingham-Hoover...| 13820| Birmingham, AL| 62|Health Care and S...| 621|Ambulatory Health...| 6214|Outpatient Care C...| 62149|Other Outpatient ...|621493|Freestanding Ambu...|ET7767EEDBF263F7B7|Principal Architects| principal architect|[\n "ES99B020D66...|[\n "Business Ob...|[\n "ES4B99FD0FD...| [\n "Infrastruct...|[\n "KS125K065BR...|[\n "Juniper Net...|[\n "ES99B020D66...|[\n "Business Ob...|[\n "KS120V86MZW...|[\n "Microsoft A...|15-2051.01|Business Intellig...|15-2051.01|Business Intellig...| []| []| []| []| []| []| 15-0000|Computer and Math...| 15-2000|Mathematical Scie...| 15-2050|Data Scientists| 15-2051|Data Scientists| 23|Information Techn...| 231510|Computer Systems ...| 23151012| Enterprise Architect| 2315| Network and Syste...| 23151012| Enterprise Architect| 231510| Computer Systems ...| 2315| Network and Syste...| 23| Information Techn...|15-0000|Computer and Math...|15-2000|Mathematical Scie...|15-2050|Data Scientists|15-2051|Data Scientists| [\n 5\n]| [\n "Cybersecuri...| 62|Health Care and S...| 621|Ambulatory Health...| 6214|Outpatient Care C...| 62149|Other Outpatient ...| 621493|Freestanding Ambu...| 165000.0| 1| Bachelor's|  
|b4e618e8d2a2b6744...| 10/9/2024| 2024-10-09 18:07:...| 2|6/2/2024|8/11/2024| NULL| [\n "Job Board"\n]|[\n "castrovalle...|[\n "https://www...| []| NULL|Principal growth ...|Principal growth ...| 7/27/2024| 55| 40794223|Aircall Internati...| Aircall| false| [\n 99\n]| [ "No Education ...| 99|No Education Listed| NULL| NULL| 1|Full-time (> 32 h...| 6.0| NULL| false|170000.0| 0| [None]| year| 220000.0| 120000.0|{\n "lat": 37.77...|U2FuIEZyYW5jaXNjb...| San Francisco, CA| 6075| San Francisco, CA|41860|San Francisco-Oak...| 6| California| 6075| San Francisco, CA| 6075| San Francisco, CA| 41860|San Francisco-Oak...| 41860|San Francisco-Oak...| 99|Unclassified Indu...| 999|Unclassified Indu...| 9999|Unclassified Indu...| 99999|Unclassified Indu...|999999|Unclassified Indu...|ET54F46C4290228B21| Growth Analysts|principal growth ...|[\n "ESA420F05EB...|[\n "Curiosity",...|[\n "KS1218H6QYL...| [\n "Business Co...| []| []|[\n "ESA420F05EB...|[\n "Curiosity",...|[\n "KS1200364C9...|[\n "C (Programm...|15-2051.01|Business Intellig...|15-2051.01|Business Intellig...| []| []| []| []| []| []| 15-0000|Computer and Math...| 15-2000|Mathematical Scie...| 15-2050|Data Scientists| 15-2051|Data Scientists| 23|Information Techn...| 231113|Data / Data Minin...| 23111310| Data Analyst| 2311| Data Analysis and...| 23111310| Data Analyst| 231113| Data / Data Minin...| 2311| Data Analysis and...| 23| Information Techn...|15-0000|Computer and Math...|15-2000|Mathematical Scie...|15-2050|Data Scientists|15-2051|Data Scientists| [\n 6\n]| [\n "Data Privac...| 99|Unclassified Indu...| 999|Unclassified Indu...| 9999|Unclassified Indu...| 99999|Unclassified Indu...| 999999|Unclassified Indu...| 170000.0| 1|Associate's or lower|  
+--------------------+-----------------+----------------------+----------+--------+---------+--------+--------------------+--------------------+--------------------+-----------+-------------------+--------------------+--------------------+---------------+----------------+---------+--------------------+--------------------+-------------------+--------------------+---------------------+-------------+-------------------+-------------+------------------+---------------+--------------------+--------------------+--------------------+-------------+--------+-----------+----------------+-------------------+---------+-----------+--------------------+--------------------+------------------+------+--------------------+-----+--------------------+-----+-------------+---------------+--------------------+---------------+--------------------+------------+--------------------+------------+--------------------+------+--------------------+------+--------------------+------+--------------------+------+--------------------+------+--------------------+------------------+--------------------+--------------------+--------------------+--------------------+--------------------+-----------------------+--------------------+--------------------+--------------------+--------------------+--------------------+--------------------+----------+--------------------+----------+--------------------+--------------------+--------------------+--------------------+--------------------+--------------------+--------------------+----------+--------------------+----------+--------------------+----------+---------------+----------+---------------+---------------+--------------------+--------------+--------------------+--------------------------+-------------------------------+--------------------+-------------------------+-----------------------------+----------------------------------+-----------------+----------------------+-----------------------+----------------------------+------------------+-----------------------+-------+--------------------+-------+--------------------+-------+---------------+-------+---------------+-----------------+----------------------+------------+--------------------+------------+--------------------+------------+--------------------+------------+--------------------+------------+--------------------+--------------+-------+--------------------+  
only showing top 20 rows

#parse  
export\_cols3 = [  
 "LOT\_V6\_SPECIALIZED\_OCCUPATION\_NAME",  
 "Average Salary",  
 "MAX\_YEARS\_EXPERIENCE"  
]

df\_selected3 = df.select(export\_cols3)  
df\_selected3.show(10)

+----------------------------------+--------------+--------------------+  
|LOT\_V6\_SPECIALIZED\_OCCUPATION\_NAME|Average Salary|MAX\_YEARS\_EXPERIENCE|  
+----------------------------------+--------------+--------------------+  
| General ERP Analy...| 108668.5| 2.0|  
| Oracle Consultant...| 108668.5| 3.0|  
| Data Analyst| 108668.5| NULL|  
| Data Analyst| 108668.5| NULL|  
| Oracle Consultant...| 92500.0| NULL|  
| Data Analyst| 110155.0| NULL|  
| Data Analyst| 108668.5| NULL|  
| Data Analyst| 108668.5| NULL|  
| General ERP Analy...| 108668.5| 7.0|  
| Data Analyst| 92962.0| 2.0|  
+----------------------------------+--------------+--------------------+  
only showing top 10 rows

pdf3 = df\_selected3.toPandas()  
#pdf2.to\_csv("./data/lighthouse\_cleaned.csv", index=False)  
#print(len(pdf2))  
pdf3.head(10)

[Stage 38:> (0 + 1) / 1]

|  | LOT\_V6\_SPECIALIZED\_OCCUPATION\_NAME | Average Salary | MAX\_YEARS\_EXPERIENCE |
| --- | --- | --- | --- |
| 0 | General ERP Analyst / Consultant | 108668.5 | 2.0 |
| 1 | Oracle Consultant / Analyst | 108668.5 | 3.0 |
| 2 | Data Analyst | 108668.5 | NaN |
| 3 | Data Analyst | 108668.5 | NaN |
| 4 | Oracle Consultant / Analyst | 92500.0 | NaN |
| 5 | Data Analyst | 110155.0 | NaN |
| 6 | Data Analyst | 108668.5 | NaN |
| 7 | Data Analyst | 108668.5 | NaN |
| 8 | General ERP Analyst / Consultant | 108668.5 | 7.0 |
| 9 | Data Analyst | 92962.0 | 2.0 |

pdf3["MAX\_YEARS\_EXPERIENCE"] = pdf3["MAX\_YEARS\_EXPERIENCE"].fillna(0)  
pdf3.head(10)

|  | LOT\_V6\_SPECIALIZED\_OCCUPATION\_NAME | Average Salary | MAX\_YEARS\_EXPERIENCE |
| --- | --- | --- | --- |
| 0 | General ERP Analyst / Consultant | 108668.5 | 2.0 |
| 1 | Oracle Consultant / Analyst | 108668.5 | 3.0 |
| 2 | Data Analyst | 108668.5 | 0.0 |
| 3 | Data Analyst | 108668.5 | 0.0 |
| 4 | Oracle Consultant / Analyst | 92500.0 | 0.0 |
| 5 | Data Analyst | 110155.0 | 0.0 |
| 6 | Data Analyst | 108668.5 | 0.0 |
| 7 | Data Analyst | 108668.5 | 0.0 |
| 8 | General ERP Analyst / Consultant | 108668.5 | 7.0 |
| 9 | Data Analyst | 92962.0 | 2.0 |

import matplotlib.pyplot as plt

groups = pdf3["LOT\_V6\_SPECIALIZED\_OCCUPATION\_NAME"].unique()  
  
plt.figure(figsize=(10,6))  
  
for g in groups:  
 subset = pdf3[pdf3["LOT\_V6\_SPECIALIZED\_OCCUPATION\_NAME"] == g]  
   
 # Add jitter to avoid overlapping points  
 x\_jitter = subset["MAX\_YEARS\_EXPERIENCE"] + np.random.normal(0, 0.2, size=len(subset))  
 y\_jitter = subset["Average Salary"] + np.random.normal(0, 0.2, size=len(subset))  
   
 plt.scatter(x\_jitter, y\_jitter, alpha=0.6, label=g)  
  
plt.xlabel("X-axis (with jitter)")  
plt.ylabel("Y-axis (with jitter)")  
plt.title("Scatter Plots per Group with Jitter")  
plt.legend()  
plt.show()

