

**Professional Readiness for Innovation, Employability  
And Entrepreneurship**

**DATA ANALYTICS ASSIGNMENT – II**

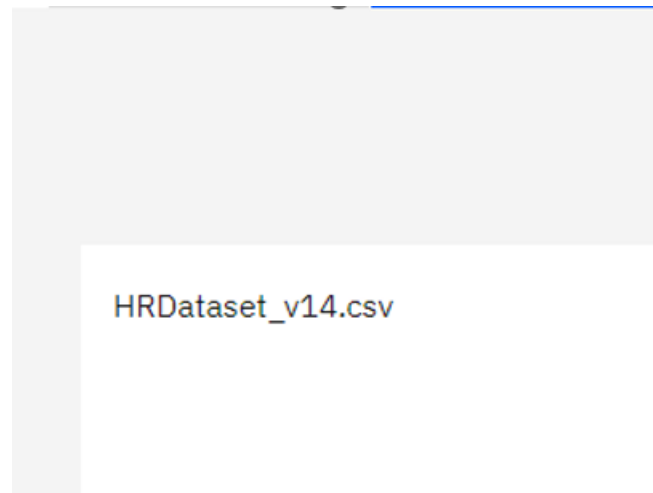
**NAGANATHAN N**

**GROUP - I**

**MADRAS INSTITUTE OF TECHNOLOGY**

## HR data analysis and exploration:

**Upload the Data set:**



# Using the data set:

Select sources

My content

Q Type any text to filter items in this folder

HRDataset\_v14.csv  
06/06/2023, 01:36

supermarket\_sales.csv  
29/04/2023, 01:43

Filter by

Reset filters

Type

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☐ Files

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☐ Today

☐ Yesterday

☐ Past week

☐ Past month

Cancel

OK

IBM Cognos Analytics with Watson

New data module

Search content

Properties

Data module

Search

New data module

Navigation paths

HRDataset\_v14.csv

Row Id

Employee\_Name

EmpID

MarriedID

MaritalStatusID

GenderID

EmpStatusID

DeptID

PerfScoreID

Salary

TermID

PositionID

Position

State

Zip

DOB

Sex

MaritalDesc

CitizenDesc

Row Id	Employee_Name	EmpID	MarriedID	MaritalStatusID	GenderID	EmpStatusID	DeptID	PerfScoreID
1	Adinolfi, Wilson K	10026	0	0	1	1	5	4
2	Alt Sidi, Karthikeyan	10084	1	1	1	5	3	3
3	Akinkuolie, Sarah	10196	1	1	0	5	5	3
4	Alagbe,Trina	10088	1	1	0	1	5	3
5	Anderson, Carol	10069	0	2	0	5	5	3
6	Anderson, Linda	10002	0	0	0	1	5	4
7	Andreola, Colby	10194	0	0	0	1	4	3
8	Athwal, Sam	10062	0	4	1	1	5	3
9	Bachiochi, Linda	10114	0	0	0	3	5	3
10	Bacong, Alejandro	10250	0	2	1	1	3	3
11	Baczinski, Rachael	10252	1	1	0	5	5	3
12	Barbara, Thomas	10242	1	1	1	5	5	3
13	Barbosa, Hector	10012	0	2	1	1	3	4
14	Barone, Francesco A	10265	0	0	1	1	5	3
15	Barton, Nader	10066	0	2	1	5	5	3
16	Bates, Norman	10061	0	0	1	4	5	3
17	Beak, Kimberly	10023	1	1	0	2	5	4
18	Beatrice, Courtney	10055	0	0	0	1	5	3

IBM Cognos Analytics with Watson									
New data module									
Search content									
Properties									
Data module									
Grid Relationships Custom tables									
	FromDiversityJobFairID	Salary	Termd	PositionID	Position	State	Zip	DOB	Sex
0	62506	0	19	Production Technician I	MA	1960	07/10/83	M	
0	104437	1	27	Sr. DBA	MA	2148	05/05/75	M	
0	64955	1	20	Production Technician II	MA	1810	09/19/88	F	
0	64991	0	19	Production Technician I	MA	1886	09/27/88	F	
0	50825	1	19	Production Technician I	MA	2169	09/08/89	F	
0	57568	0	19	Production Technician I	MA	1844	05/22/77	F	
0	95660	0	24	Software Engineer	MA	2110	05/24/79	F	
0	59365	0	19	Production Technician I	MA	2199	02/18/83	M	
1	47837	0	19	Production Technician I	MA	1902	02/11/70	F	
0	50178	0	14	IT Support	MA	1886	01/07/88	M	
1	54670	1	19	Production Technician I	MA	1902	01/12/74	F	
1	47211	1	19	Production Technician I	MA	2062	02/21/74	M	
1	92328	0	9	Data Analyst	TX	78230	07/04/88	M	
0	58709	0	19	Production Technician I	MA	1810	07/20/83	M	
0	52505	1	19	Production Technician I	MA	2747	07/15/77	M	
0	57834	1	19	Production Technician I	MA	2050	10/18/81	M	
0	70131	0	20	Production Technician II	MA	2145	04/17/66	F	
0	59026	0	19	Production Technician I	MA	1915	10/27/70	F	

IBM Cognos Analytics with Watson									
New data module									
Search content									
Properties									
Data module									
Grid Relationships Custom tables									
	MaritalDesc	CitizenDesc	HispanicLatino	RaceDesc	DateofHire	DateofTermination	TermReason	EmploymentStatus	Department
Single	US Citizen	No	White	7/5/2011	Null	N/A-StillEmployed	Active	Production	
Married	US Citizen	No	White	3/30/2015	6/16/2016	career change	Voluntarily Terminated	IT/IS	
Married	US Citizen	No	White	7/5/2011	9/24/2012	hours	Voluntarily Terminated	Production	
Married	US Citizen	No	White	1/7/2008	Null	N/A-StillEmployed	Active	Production	
Divorced	US Citizen	No	White	7/11/2011	9/6/2016	return to school	Voluntarily Terminated	Production	
Single	US Citizen	No	White	1/9/2012	Null	N/A-StillEmployed	Active	Production	
Single	US Citizen	No	White	11/10/2014	Null	N/A-StillEmployed	Active	Software Engineering	
Widowed	US Citizen	No	White	9/30/2013	Null	N/A-StillEmployed	Active	Production	
Single	US Citizen	No	Black or African American	7/6/2009	Null	N/A-StillEmployed	Active	Production	
Divorced	US Citizen	No	White	1/5/2015	Null	N/A-StillEmployed	Active	IT/IS	
Married	US Citizen	Yes	Black or African American	1/10/2011	1/12/2017	Another position	Voluntarily Terminated	Production	
Married	US Citizen	Yes	Black or African American	4/2/2012	9/19/2016	unhappy	Voluntarily Terminated	Production	
Divorced	US Citizen	No	Black or African American	11/10/2014	Null	N/A-StillEmployed	Active	IT/IS	
Single	US Citizen	No	Two or more races	2/20/2012	Null	N/A-StillEmployed	Active	Production	
Divorced	US Citizen	No	White	9/24/2012	4/6/2017	Another position	Voluntarily Terminated	Production	
Single	US Citizen	No	White	2/21/2011	8/4/2017	attendance	Terminated for Cause	Production	
Married	US Citizen	No	White	7/21/2016	Null	N/A-StillEmployed	Active	Production	
Single	Eligible NonCitizen	No	White	4/4/2011	Null	N/A-StillEmployed	Active	Production	

IBM Cognos Analytics with Watson

New data module

Search content

Properties

Search

New data module

Navigation paths

HRDataset\_v14.csv

# Row Id

# Employee\_Name

# EmpID

# MarriedID

# MaritalStatusID

# GenderID

# EmpStatusID

# DeptID

# PerfScoreID

# FromDive\_bFairID

Salary

Termd

# PositionID

Position

State

Zip

DOB

Sex

MaritalDesc

CitizenDesc

Grid

Relationships

Custom tables

ManagerName	ManagerID	RecruitmentSource	PerformanceScore	EngagementSurvey	EmpSatisfaction	SpecialProjectsCount	LastPerfor...review_Date	DaysLateLast30
Michael Albert	22	LinkedIn	Exceeds	4.6	5	0	1/17/2019	0
Simon Roup	4	Indeed	Fully Meets	4.96	3	6	2/24/2016	0
Kissy Sullivan	20	LinkedIn	Fully Meets	3.02	3	0	5/15/2012	0
Elijah Gray	16	Indeed	Fully Meets	4.84	5	0	1/3/2019	0
Webster Butler	39	Google Search	Fully Meets	5	4	0	2/1/2016	0
Amy Dunn	11	LinkedIn	Exceeds	5	5	0	1/7/2019	0
Alex Sweetwater	10	LinkedIn	Fully Meets	3.04	3	4	1/2/2019	0
Ketsia Liebig	19	Employee Referral	Fully Meets	5	4	0	2/25/2019	0
Brannon Miller	12	Diversity Job Fair	Fully Meets	4.46	3	0	1/25/2019	0
Peter Monroe	7	Indeed	Fully Meets	5	5	6	2/18/2019	0
David Stanley	14	Diversity Job Fair	Fully Meets	4.2	4	0	1/30/2016	0
Kissy Sullivan	20	Diversity Job Fair	Fully Meets	4.2	3	0	5/6/2016	0
Simon Roup	4	Diversity Job Fair	Exceeds	4.28	4	5	2/25/2019	0
Kelley Spirea	18	Google Search	Fully Meets	4.6	4	0	2/14/2019	0
Michael Albert	22	On-line Web application	Fully Meets	5	5	0	3/2/2017	0
Kelley Spirea	18	Google Search	Fully Meets	5	4	0	4/5/2017	0
Kelley Spirea	18	Employee Referral	Exceeds	4.4	3	0	1/14/2019	0
Elijah Gray	16	Google Search	Fully Meets	5	5	0	1/14/2019	0

Absences
1
17
3
15
2
15
19
19
4
16
12
15
9
7
1
20
16
12

# Preparing a new data module:

## Data Module

The screenshot shows the IBM Cognos Analytics interface with a data module named 'assignment\_2'. The left sidebar displays a navigation tree with the following structure:

- assignment\_2
  - Navigation paths
  - HRDataset\_v14.csv
    - Salary
      - Salary (Group)
    - Position
    - State
    - Sex
    - GenderID
    - MaritalDesc
    - MaritalStatusID
    - CitizenDesc
    - HispanicLatino
    - RaceDesc
    - Termd
    - TermReason
    - EmploymentStatus
    - EmpStatusID
    - Department
    - DeptID
    - ManagerID
    - RecruitmentSource
    - FromDive\_bFairID

The main grid view displays the following data:

T1	Salary	Salary (Group)	Position	State	Sex	GenderID	MaritalDesc	MaritalStatusID	CitizenDesc
62506	Low		Production Technician I	MA	M	1	Single	0	US Citizen
64955	Low		Production Technician II	MA	F	0	Married	1	US Citizen
50825	Low		Production Technician I	MA	F	0	Divorced	2	US Citizen
47837	Low		Production Technician I	MA	F	0	Single	0	US Citizen
52505	Low		Production Technician I	MA	M	1	Divorced	2	US Citizen
64919	Low		Production Technician I	MA	F	0	Divorced	2	US Citizen
57815	Low		Production Technician II	MA	F	0	Single	0	US Citizen
63763	Low		Production Technician II	MA	F	0	Single	0	US Citizen
60380	Low		Production Technician I	MA	M	1	Single	0	US Citizen
64786	Low		Production Technician I	MA	F	0	Single	0	US Citizen
64816	Low		Production Technician I	MA	F	0	Single	0	Non-Citizen
68678	Low		IT Support	MA	M	1	Single	0	US Citizen
50373	Low		Production Technician I	MA	M	1	Married	1	US Citizen
63108	Low		Production Technician I	MA	M	1	Single	0	US Citizen
57583	Low		Production Technician I	MA	F	0	Married	1	US Citizen
58275	Low		Production Technician II	MA	F	0	Separated	3	US Citizen
51259	Low		Production Technician I	MA	M	1	Single	0	US Citizen
54285	Low		Production Technician I	MA	M	1	Married	1	US Citizen

IBM Cognos Analytics with Watson

assignment\_2

Search content

Properties

Data module

Search

assignment\_2

- Navigation paths
- HRDataset\_v14.csv
  - Salary
  - Salary (Group)
  - Position
  - State
  - Sex
  - GenderID
  - MaritalDesc
  - MaritalStatusID
  - CitizenDesc
  - HispanicLatino
  - RaceDesc
  - Termd
  - TermReason
  - EmploymentStatus
  - EmpStatusID
  - Department
  - DeptID
  - ManagerID
  - RecruitmentSource
  - FromDive\_bFairID

Grid

Relationships

Custom tables

T1	HispanicLatino	RaceDesc	Termd	TermReason	EmploymentStatus	EmpStatusID	Department	DeptID	ManagerID
No	White	0	N/A-StillEmployed	Active	1	Production	5	22	
No	White	1	hours	Voluntarily Terminated	5	Production	5	20	
No	White	1	return to school	Voluntarily Terminated	5	Production	5	39	
No	Black or African American	0	N/A-StillEmployed	Active	3	Production	5	12	
No	White	1	Another position	Voluntarily Terminated	5	Production	5	22	
No	Asian	0	N/A-StillEmployed	Active	1	Production	5	19	
No	White	1	career change	Voluntarily Terminated	5	Production	5	16	
No	Black or African American	0	N/A-StillEmployed	Active	1	Production	5	11	
No	White	0	N/A-StillEmployed	Active	1	Production	5	Null	
No	White	1	relocation out of area	Voluntarily Terminated	5	Production	5	11	
No	Black or African American	0	N/A-StillEmployed	Active	1	Production	5	19	
No	White	0	N/A-StillEmployed	Active	1	IT/IS	3	6	
No	White	0	N/A-StillEmployed	Active	2	Production	5	12	
No	White	0	N/A-StillEmployed	Active	1	Production	5	14	
No	White	0	N/A-StillEmployed	Active	1	Production	5	16	
No	Black or African American	1	more money	Voluntarily Terminated	5	Production	5	18	
No	White	0	N/A-StillEmployed	Active	1	Production	5	19	
No	White	0	N/A-StillEmployed	Active	1	Production	5	18	

IBM Cognos Analytics with Watsonassignment\_2

Search content

Properties

Search

assignment\_2

Navigation paths

HRDataset\_v14.csv

Salary

Salary (Group)

Position

State

Sex

# GenderID

# MaritalDesc

# MaritalStatusID

# CitizenDesc

# HispanicLatino

# RaceDesc

Term

TermReason

EmploymentStatus

# EmpStatusID

Department

# DeptID

# ManagerID

RecruitmentSource

# FromDive\_bFairID

Grid

Relationships

Custom tables

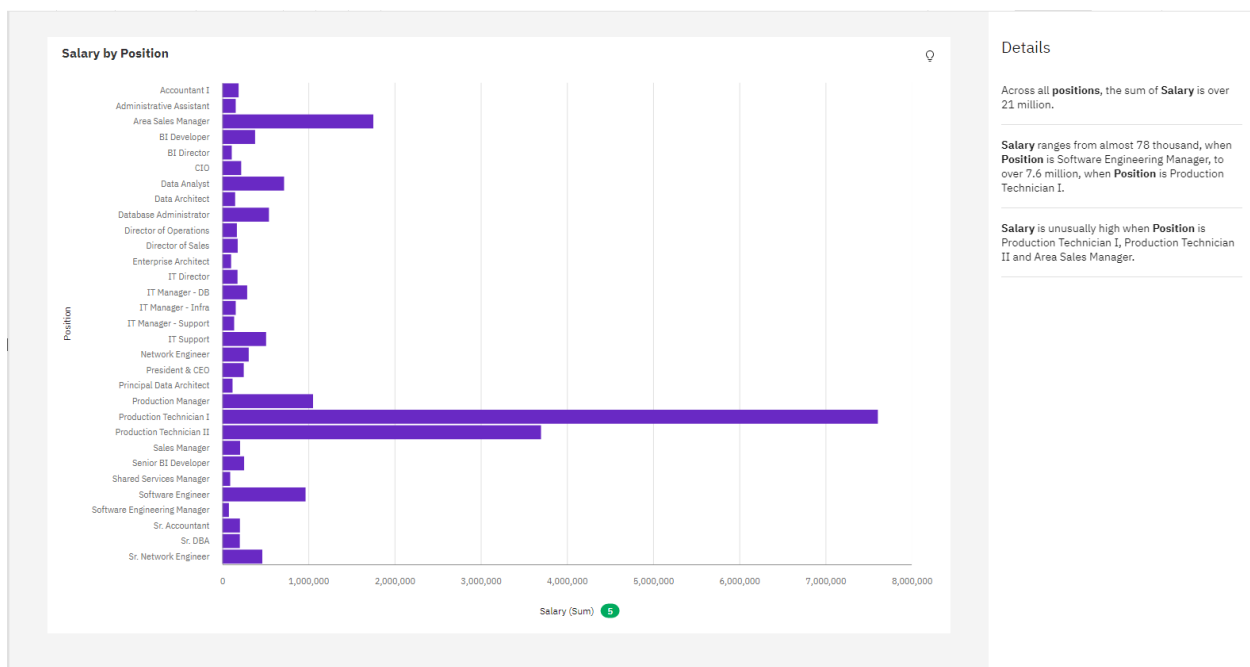
T1	RecruitmentSource	FromDiversityJobFairID	PerfScoreID	PerformanceScore	EngagementSurvey	EmpSatisfaction	SpecialProjectsCount	DaysLateLast30	DaysLateLast30 (Gro
	Diversity Job Fair	1	3	Fully Meets	4.46	3	0	0	less than 2
	On-line Web application	0	3	Fully Meets	5	5	0	0	less than 2
	Indeed	0	3	Fully Meets	4.2	3	0	0	less than 2
	Google Search	0	3	Fully Meets	4.8	5	0	0	less than 2
	Employee Referral	0	3	Fully Meets	4.51	4	0	0	less than 2
	LinkedIn	0	3	Fully Meets	3.8	5	0	0	less than 2
	Indeed	0	3	Fully Meets	4.3	4	0	0	less than 2
	Indeed	0	3	Fully Meets	3.58	5	0	0	less than 2
	Indeed	0	3	Fully Meets	4.7	3	6	0	less than 2
	Employee Referral	0	4	Exceeds	4.1	4	0	0	less than 2
	Employee Referral	0	3	Fully Meets	4.4	5	0	0	less than 2
	Indeed	0	3	Fully Meets	5	3	0	0	less than 2
	Google Search	0	3	Fully Meets	4.62	5	0	0	less than 2
	Indeed	0	3	Fully Meets	4.3	4	0	0	less than 2
	Employee Referral	0	3	Fully Meets	4.2	3	0	0	less than 2
	LinkedIn	0	3	Fully Meets	4.7	4	5	0	less than 2
	Employee Referral	0	3	Fully Meets	4.5	3	0	0	less than 2



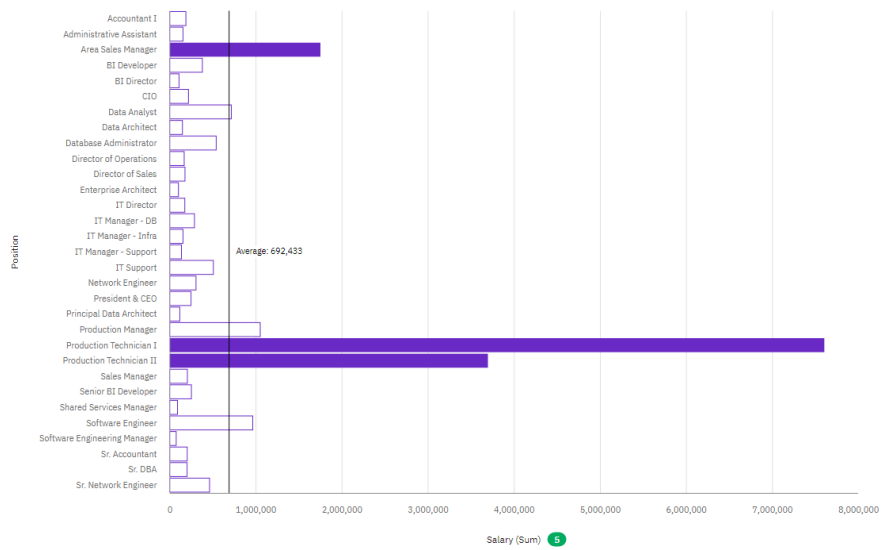
Absences	Absences (Group)
2	less than 6
4	less than 6
1	less than 6
2	less than 6
5	less than 6
3	less than 6
4	less than 6
3	less than 6
3	less than 6
2	less than 6
5	less than 6
3	less than 6
1	less than 6
1	less than 6
1	less than 6
3	less than 6
1	less than 6
5	less than 6
4	less than 6

# Exploring and visualizing the Data:

## Exploration module



Salary by Position



## Analytics

### Insights



#### Show average value



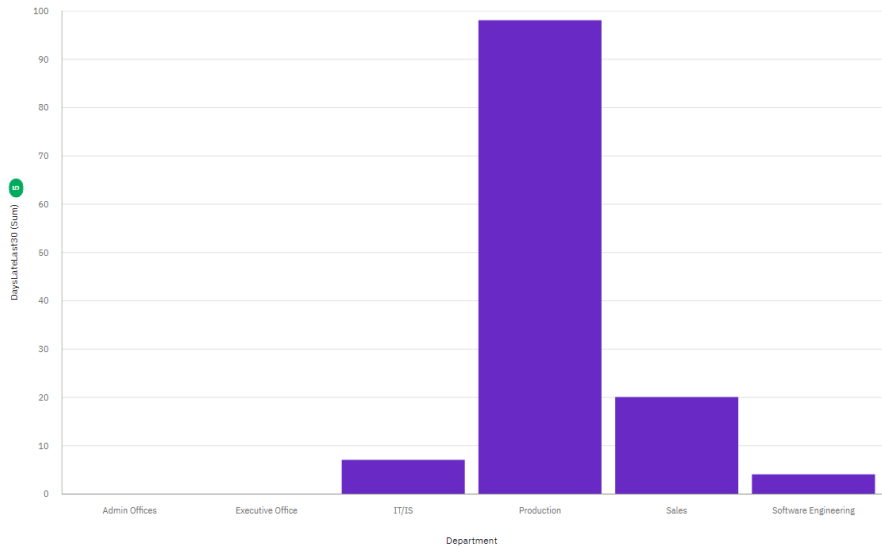
The average value of Salary is 692,433.

#### Show meaningful differences



3 found

DaysLateLast30 by Department



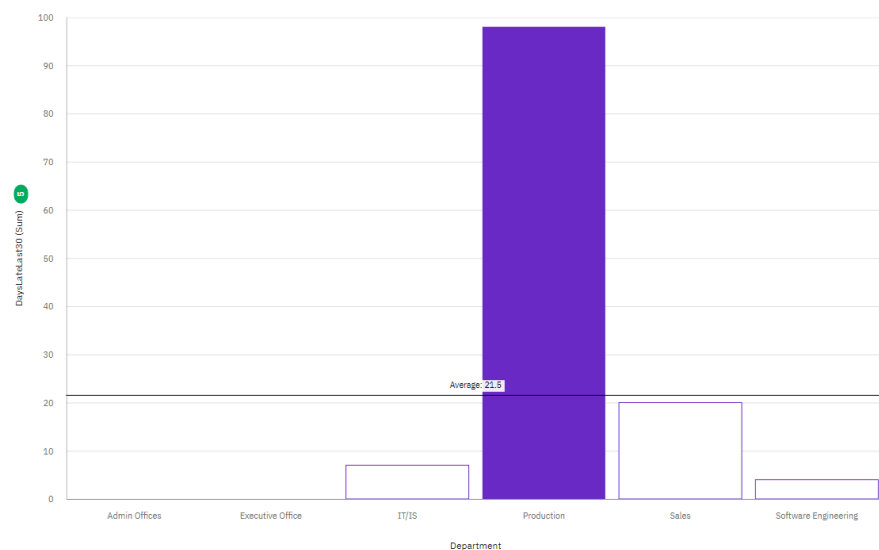
## Details

Over all departments, the sum of DaysLateLast30 is 129.

DaysLateLast30 ranges from 0, when Department is Admin Offices, to 98, when Department is Production.

DaysLateLast30 is unusually high when Department is Production.

DaysLateLast30 by Department



## Analytics

### Insights

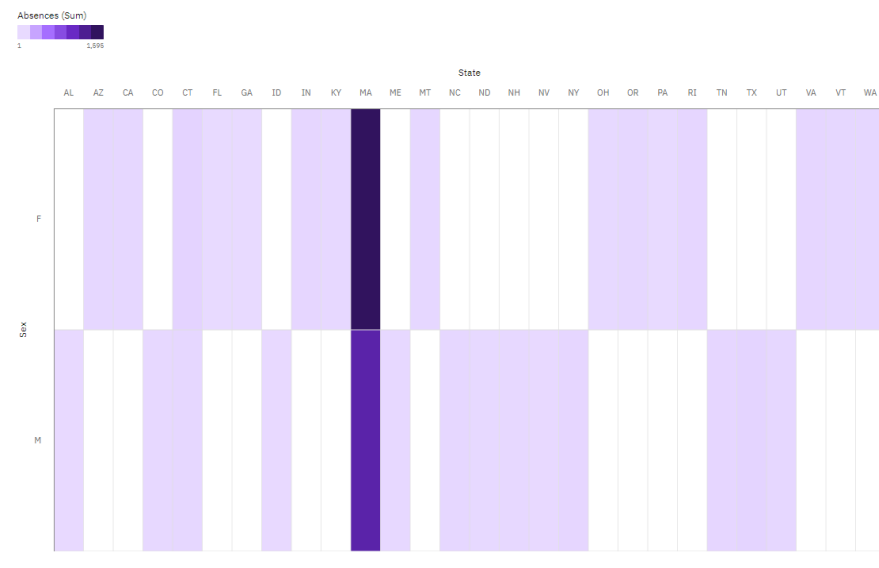
Show average value

The average value of DaysLateLast30 is 21.5.

Show meaningful differences

1 found

Absences by Sex and State



## Details

Absences is unusually high in MA.

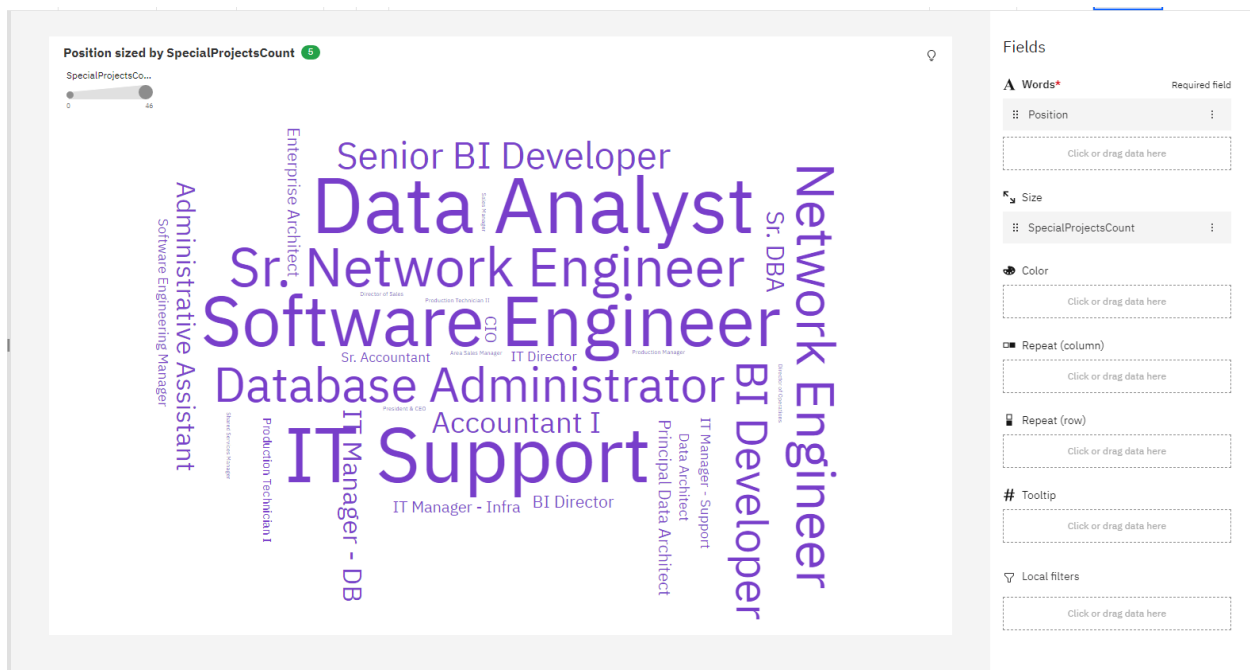
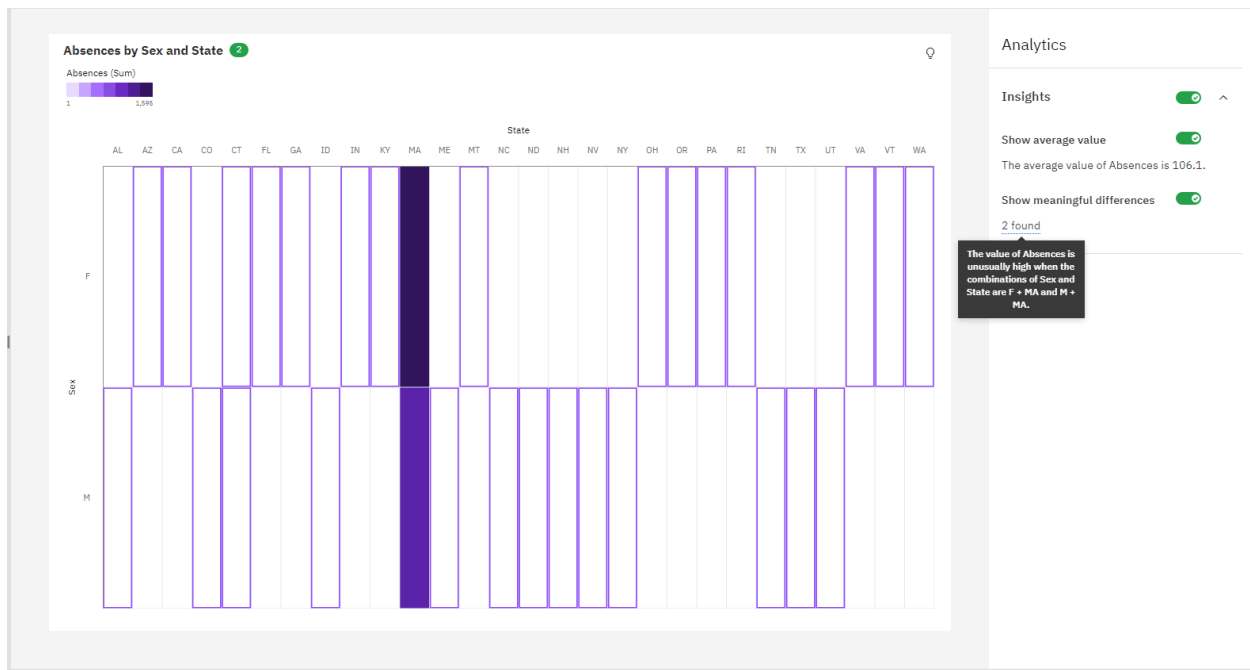
Across all **sexes** and **states**, the sum of **Absences** is over three thousand.

The summed values of **Absences** range from 1 to over 1500.

**Absences** is unusually high when the combinations of **Sex** and **State** are F and MA and M and MA.

For **Absences**, the most significant value of **State** is MA, whose respective **Absences** values add up to nearly three thousand, or 87.9 % of the total.

For **Absences**, the most significant value of **Sex** is F, whose respective **Absences** values add up to nearly two thousand, or 56.7 % of the total.



### Position sized by SpecialProjectsCount



### Analytics

#### Insights

Show average value

The average value of SpecialProjectsCount is 12.23.

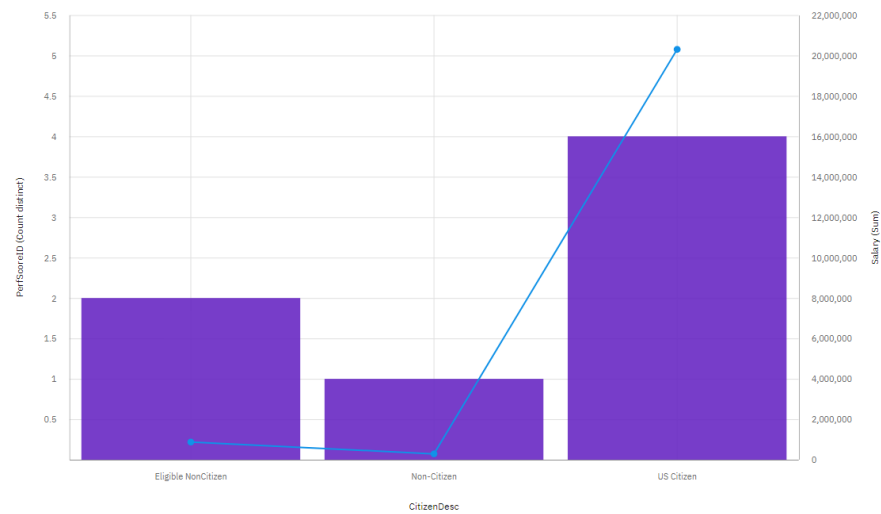
Show meaningful differences

6 found

The value of SpecialProjectsCount is unusually high when the values of Position are Data Analyst, IT Support, Software Engineer, Sr. Network Engineer, Network Engineer and more.

### Salary and PerfScoreID by CitizenDesc

Column: PerfScoreID (Count distinct)  
Line: Salary (Sum)



### Details

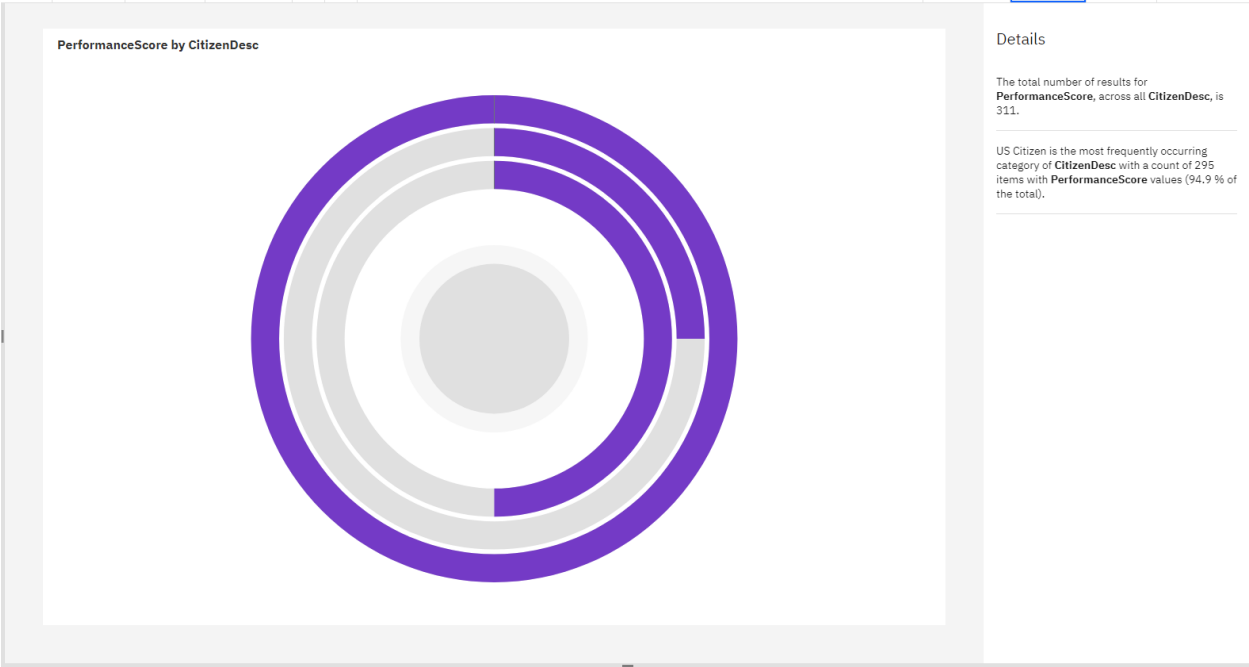
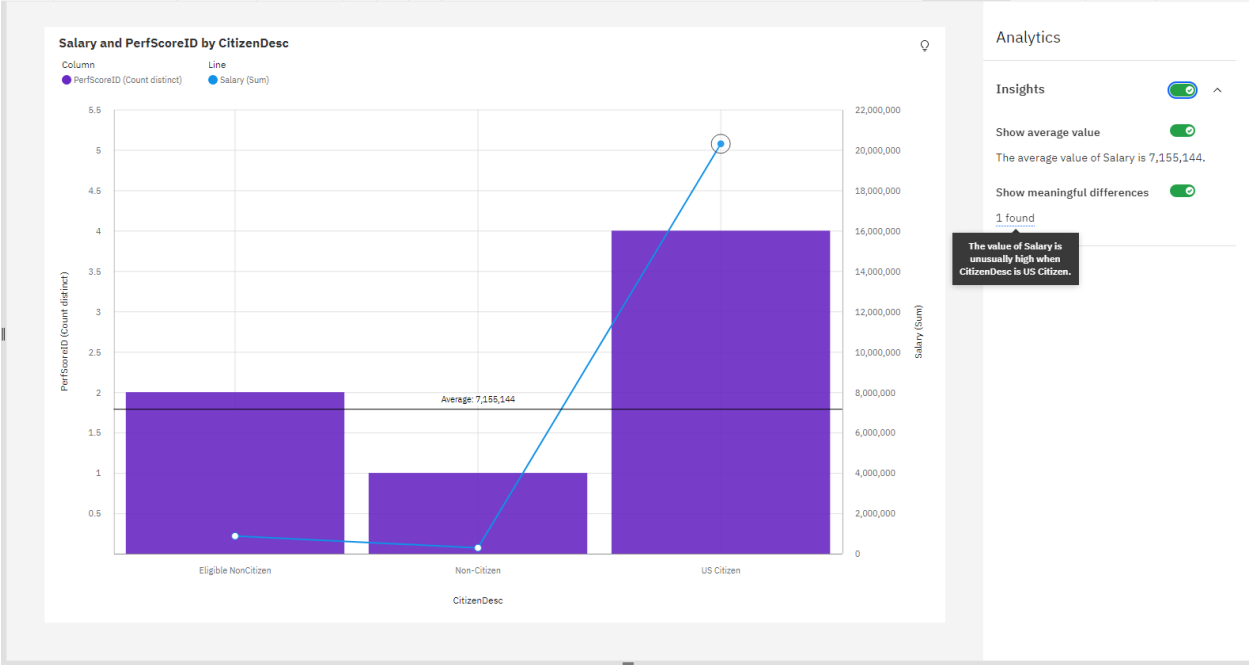
The total number of results for PerfScoreID, across all CitizenDesc, is 311.

US Citizen is the most frequently occurring category of CitizenDesc with a count of 295 items with PerfScoreID values (94.9 % of the total).

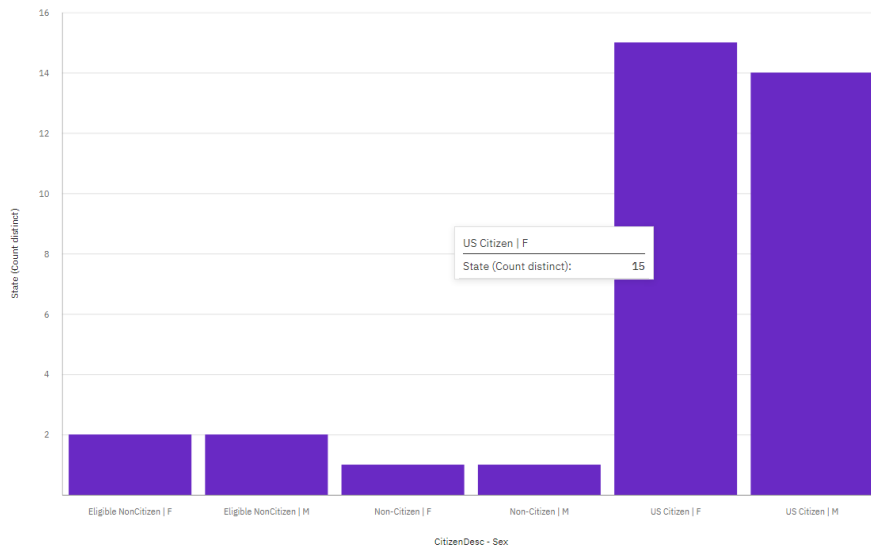
Across all values of CitizenDesc, the sum of Salary is over 21 million.

Salary ranges from over 289 thousand, when CitizenDesc is Non-Citizen, to over 20 million, when CitizenDesc is US Citizen.

Salary is unusually high when CitizenDesc is US Citizen.



State by CitizenDesc and Sex

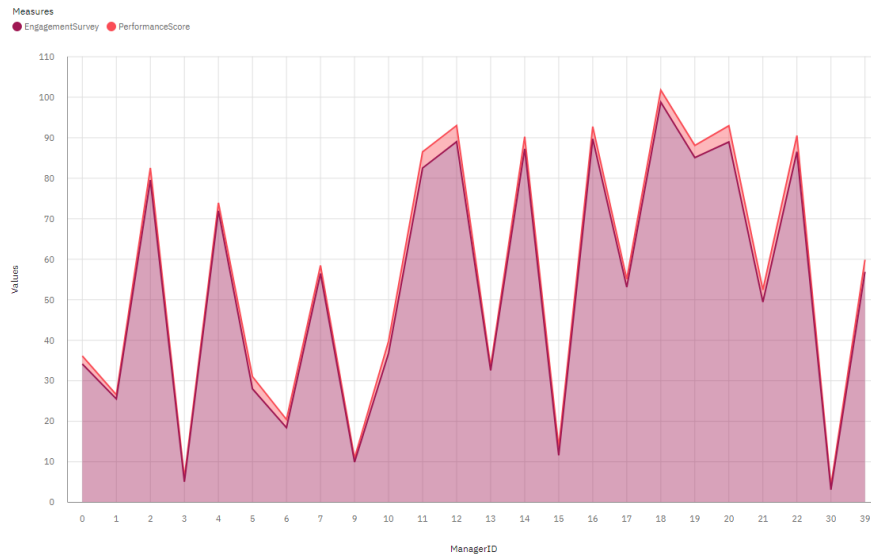


#### Details

The total number of results for **State**, across all **citizendesc - sexes**, is 311.

US Citizen|F (53.7 %) and US Citizen|M (41.2 %) are the most frequently occurring categories of **CitizenDesc - Sex** with a combined count of 295 items with **State** values (94.9 % of the total).

EngagementSurvey and PerformanceScore by ManagerID



#### Details

The total number of results for **EngagementSurvey**, across all **ManagerID**, is 311.

Over all values of **ManagerID**, the average of **EngagementSurvey** is 4.11.

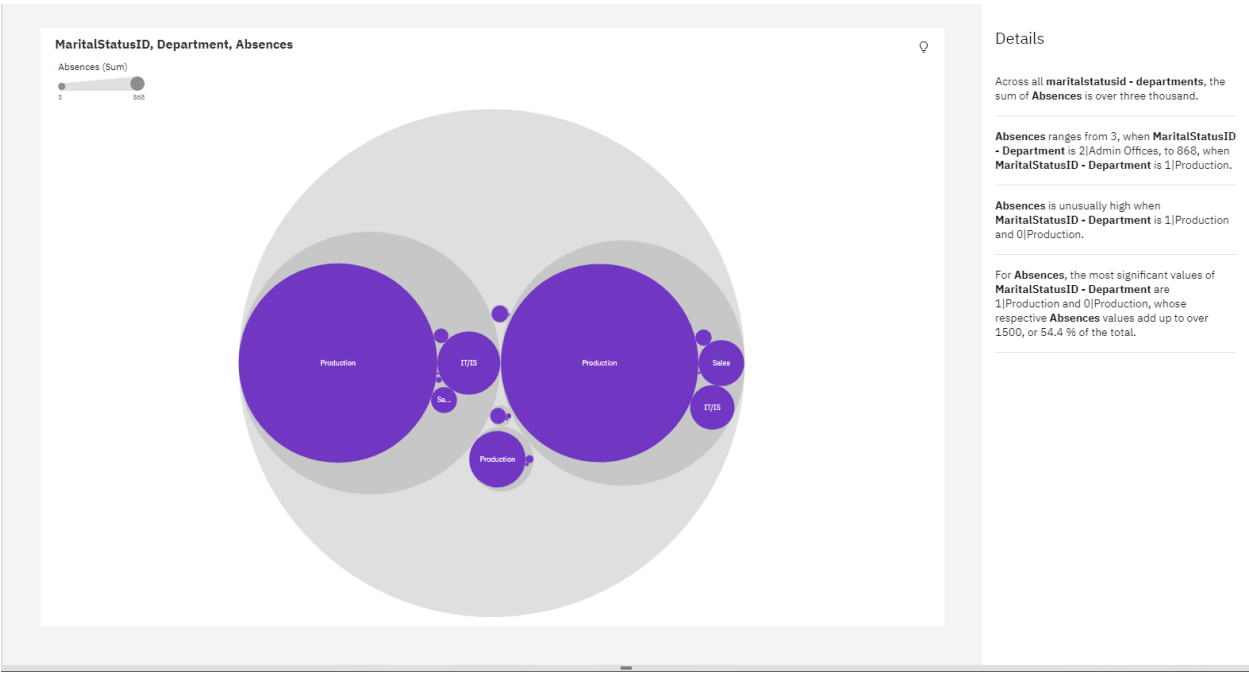
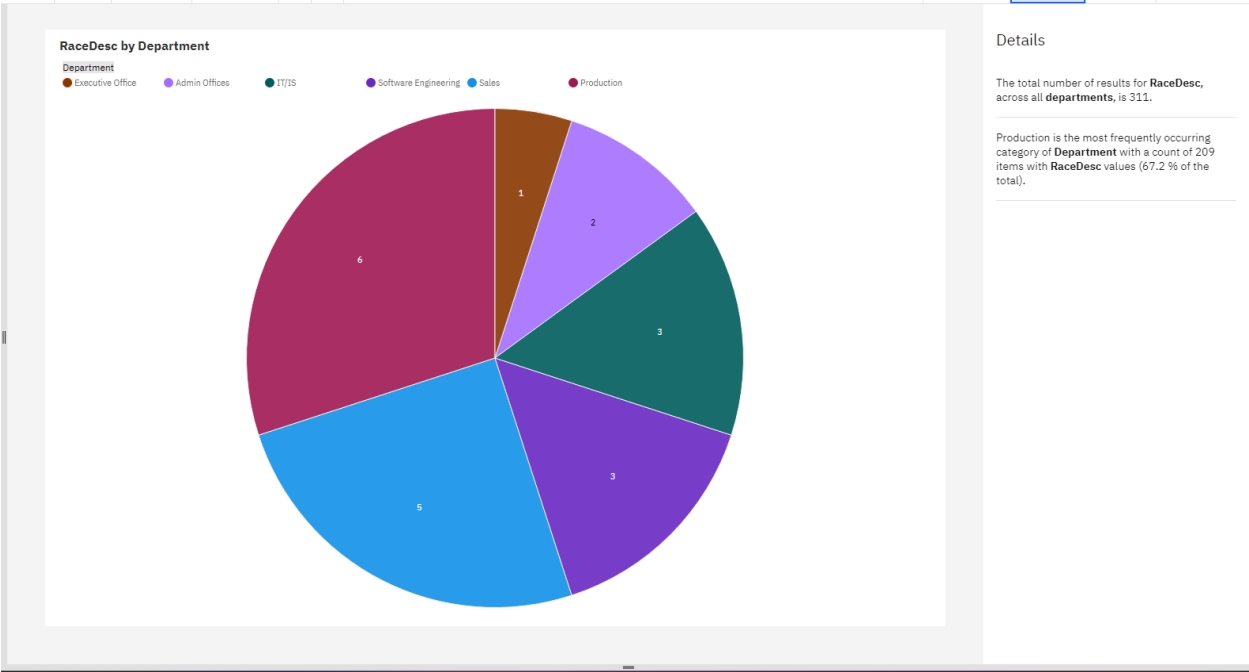
The total number of results for **PerformanceScore**, across all **ManagerID**, is 311.

**EngagementSurvey** ranges from 3.03, when **ManagerID** is 30, to 98.66, when **ManagerID** is 18.

**EngagementSurvey** is most unusual when **ManagerID** is 30, 3 and 18.

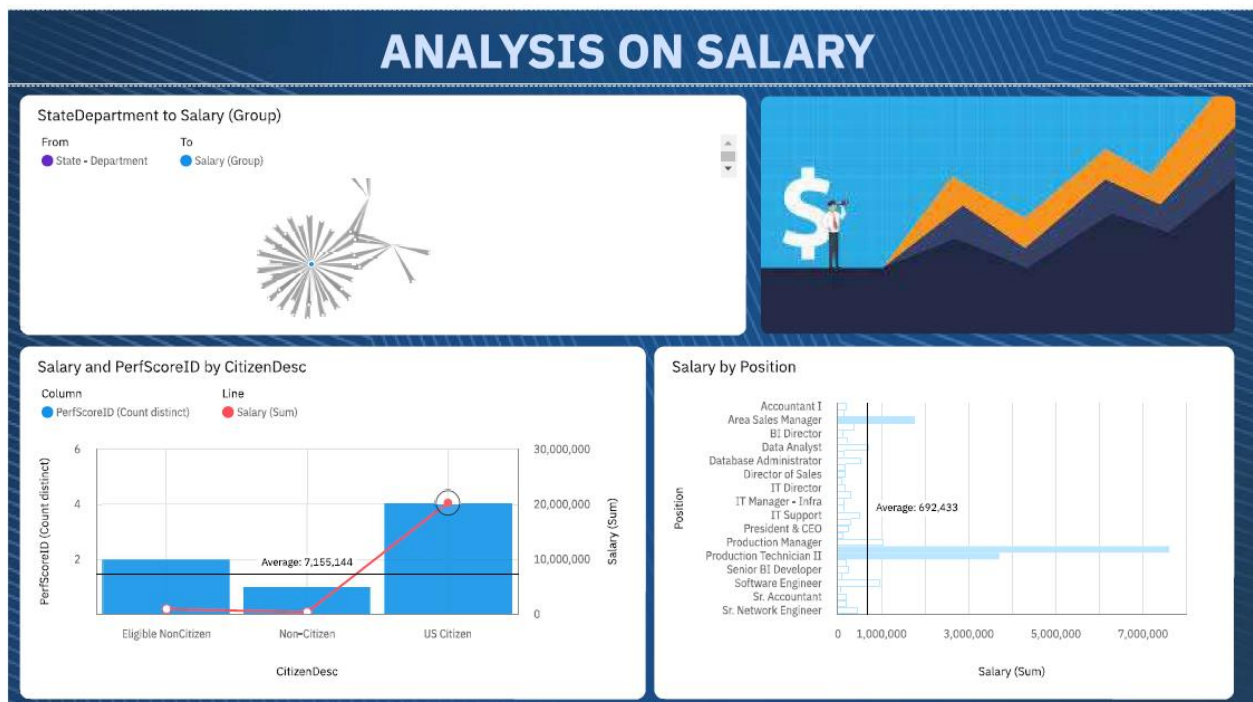
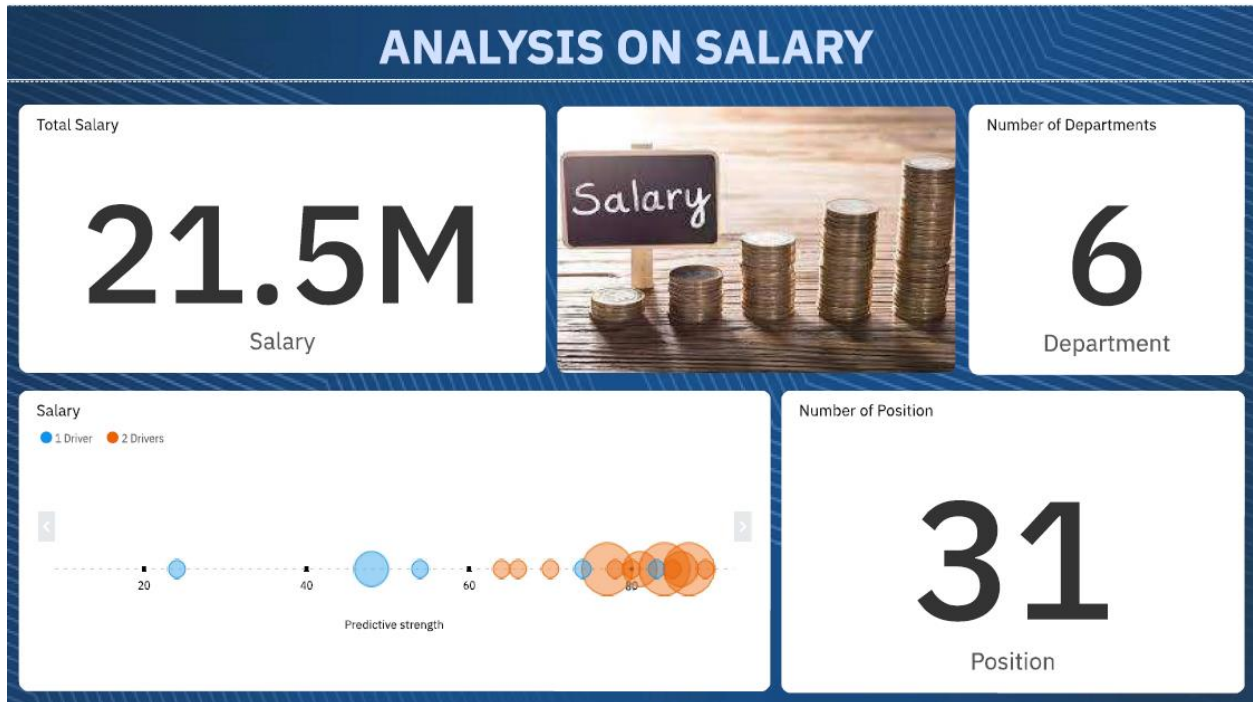
12 (7.1 %), 16 (7.1 %), 18 (7.1 %), 20 (7.1 %), and 11 (6.8 %) are the most frequently occurring categories of **ManagerID** with a combined count of 109 items with **EngagementSurvey** values (35 % of the total).





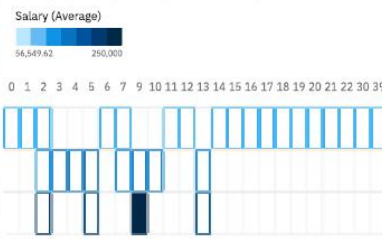


## Dashboard:

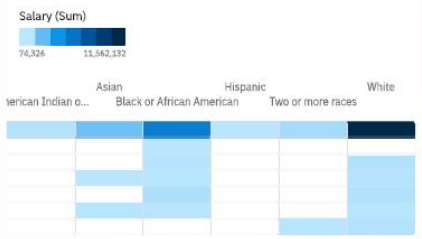


# ANALYSIS ON SALARY

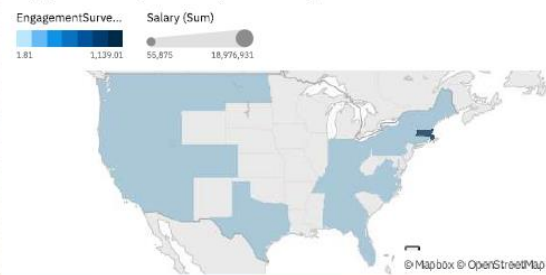
Salary by Salary (Group) and ManagerID



Salary by DaysLateLast30 and RaceDesc



EngagementSurvey and Salary for State regions



Salary by DaysLateLast30 colored by RecruitmentSource

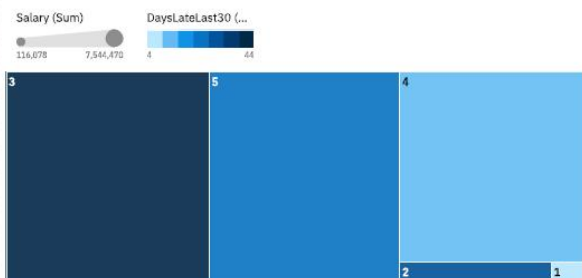


# ANALYSIS ON SALARY

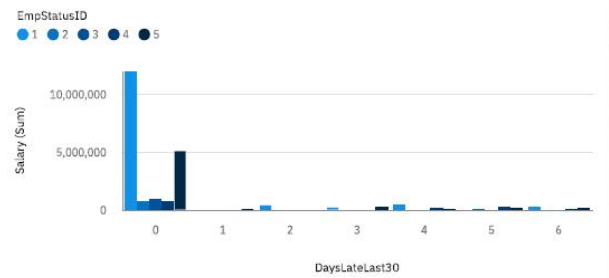
Salary by GenderID colored by DaysLateLast30



EmpSatisfaction colored by DaysLateLast30 sized by Salary



Salary by DaysLateLast30 colored by EmpStatusID



## **Creating dashboard**

[https://ap2.ca.analytics.ibm.com/bi/?perspective=dashboard&pathRef=.public\\_folders%2Fassignments%2Fdash1&action=view&mode=dashboard&subView=model00000187f0b2d2d3\\_00000003](https://ap2.ca.analytics.ibm.com/bi/?perspective=dashboard&pathRef=.public_folders%2Fassignments%2Fdash1&action=view&mode=dashboard&subView=model00000187f0b2d2d3_00000003)

## **Creating a report**

[https://ap2.ca.analytics.ibm.com/bi/?pathRef=.my\\_folders%2FNM\\_Report](https://ap2.ca.analytics.ibm.com/bi/?pathRef=.my_folders%2FNM_Report)

## **Story:**

[https://ap2.ca.analytics.ibm.com/bi/?perspective=story&pathRef=.my\\_folders%2FNM\\_Story&action=view&mode=dashboard](https://ap2.ca.analytics.ibm.com/bi/?perspective=story&pathRef=.my_folders%2FNM_Story&action=view&mode=dashboard)