Data Analytics

Inland Empire/Desert Region (Riverside and San Bernardino counties)

Summary

The Community College
Computer Systems Analysis
Program
(TOP 0707.30)

Provides training for
Computer Systems Analysts (SOC 15-1211)
Data Scientists (15-2051)
Occupation

Over the next five years (2021-2026), data analytics employment is projected to

Increase Employment by
7%

252
Annual Job Openings

Median Hourly Earnings
$45.68 - $46.74
Above the $21.82 Hourly Living Wage Standard

1 Total Annual Award
in programs related to Data Analysis

1
Program Award from Community College Programs

0
Program Awards from Other Postsecondary Education Providers

The Inland Empire/Desert Centers of Excellence
Recommends
data analytics program development to meet the need for more workers in the region

Introduction

This report provides labor market occupational demand, wage research, and postsecondary program outcomes related to data analytics. The California Community College program most likely to prepare students for data analytics employment is the computer systems analysis (TOP 0707.30) program. California Community College computer systems analysis programs prepare students for employment through instruction related to systems analysis and design, including the recognition, definition, and improvement of processes through the use of computer technology and methodologies (Taxonomy of Programs, 2012). The knowledge, skills, and abilities trained by computer systems analysis programs lead to two bachelor's degree-level occupations referred to as the data analytics occupational group:

- Computer Systems Analysts (SOC 15-1211)
- Data Scientists (15-2051)

Aside from the bachelor's degree-level occupations listed above, two data analyst occupations, typically requiring a master's degree to enter employment were omitted from this report, computer and information research scientists and statisticians. A community college data analytics program would not directly prepare students for jobs in these occupations, and they have been omitted from this report to prevent an overstatement of demand related to community college training and four-year university transfer opportunities.

Job Counts and Projections

In 2021, an estimated 2,947 data analytics jobs were employed in the region. By 2026, employment for the data analytics occupational group is expected to increase by 7% to 3,151 total jobs. This occupational group is projected to have 252 annual job openings due to new job growth and replacement needs, e.g., retirements, workers moving outside of the region, and promotions. Exhibit 1 displays the job counts, projected job growth, job openings, and the share of incumbent workers aged 55 years and older in the region.

Exhibit 1: Five-year projections, Inland Empire/Desert Region, 2021-2026

Occupation	2021 Jobs	2026 Jobs	5-Yr % Change	5-Yr Openings (New + Replacement Jobs)	Annual Openings (New + Replacement Jobs)	% of workers age 55+
Computer Systems Analysts	2,585	2,728	6%	1,060	212	21%
Data Scientists	361	424	17%	198	40	17%
Total	**2,947**	**3,151**	**7%**	**1,258**	**252**	**20%**

Source: Lightcast 2022.3

An online job advertisement (ad) search for the data analytics occupational group was conducted to reveal the employers seeking these workers, including the time it takes to fill positions, earnings information, and in-demand skills. The skills filters "data analysis" and "data analytics" were applied to this job ad search to ensure that the job ad information displayed in this report is specific to data analytics positions. Approximately 32% of the total job ads (371 out of 1,150 ads) for the data analytics occupational group were specific to data analytics positions. Over the previous 12 months, there were 371 data analytics job ads posted for the data analytics occupational group in the region.

Exhibit 2 shows the number of job ads posted in the region during the last 12 months and the regional and statewide average time to fill this job. On average, regional employers fill online job advertisements for the data analytics occupational group in 36 days, two days shorter than the statewide average time to fill. Time to fill information indicates that regional employers face similar challenges as statewide employers when filling open data analytics positions.

Exhibit 2: Job ads and time to fill, Inland Empire/Desert Region, November 2021 – October 2022

Occupation	Job Ads	Regional Average Time to Fill (Days	Statewide Average Time to Fill (Days)
Data Scientists	257	33	37
Computer Systems Analysts	114	40	40
Total	**371**	**36**	**38**

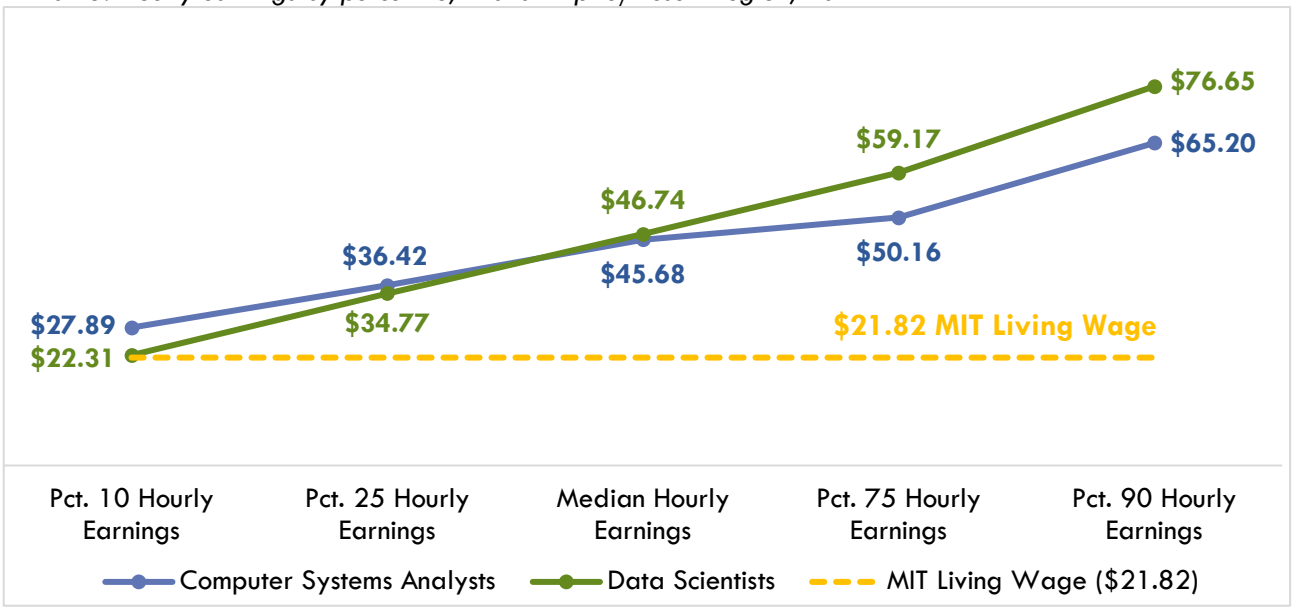
Source: Burning Glass – Labor Insights

Earnings

Community colleges should ensure their training programs lead to employment opportunities that provide a living wage. The MIT living wage calculator estimates that an individual must earn $21.82 per hour or $45,386 annually in California to be self-sufficient (Glasmeier, 2022).

Exhibit 3 displays the hourly earnings for the data analytics occupational group. The 10th percentile hourly earnings for the data analytics occupational group are higher than the living wage standard, indicating that at least 90% of these workers earn a living wage.

Exhibit 3: Hourly earnings by percentile, Inland Empire/Desert Region, 2021



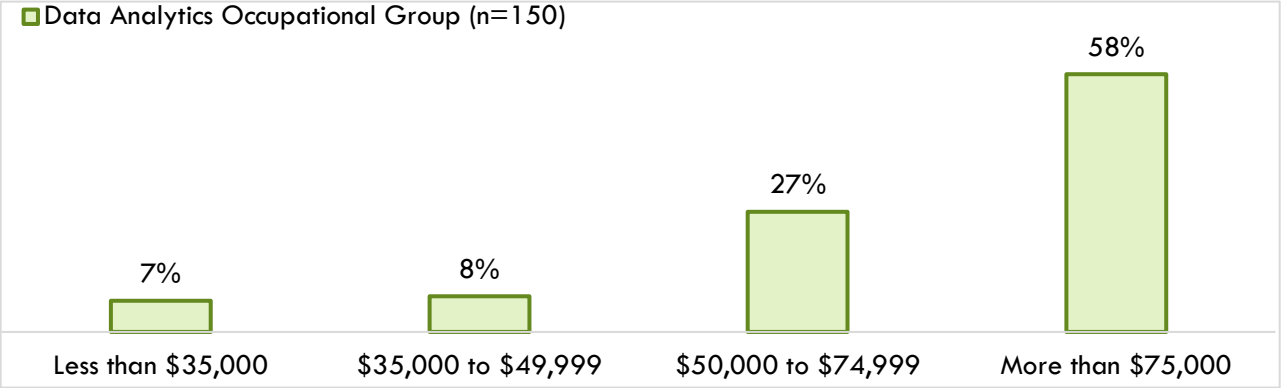
Source: Lightcast 2022.3

Advertised Salary from Online Job Ads

Exhibit 4 displays the advertised salary data from employer job ads posted for the data analytics occupational group over the last 12 months. Online job ad salary information reveals employers willing to pay the data analytics occupational group an average annual salary of $79,000, above the region's

$45,386 annual ($21.82 hourly) MIT living wage standard. Consider the salary information with caution since only 40% (150 out of 371) of online job ads for these occupations provided salary information.

Exhibit 4: Advertised salary information, Inland Empire/Desert Region, November 2021 – October 2022



Source: Burning Glass – Labor Insights

Job Titles, Employers, Skills, Education, and Work Experience

Exhibit 5 displays the job titles most frequently requested by employers seeking data analytics workers in the region over the last 12 months. The most frequently requested job title for the data analytics occupational group over the previous 12 months was data analyst, followed by business systems analyst.

Exhibit 5: Most frequently used job titles in employer job ads, Inland Empire/Desert Region, November 2021 – October 2022

Job Titles	Job Ads
Data Analyst	133
Business Systems Analyst	50
Senior Data Analyst	30
Business Intelligence Analyst	26
Business Information Analyst	24
Quality Systems Analyst	16
Business Data Analyst	11
All other job titles	*81*
Total	**371**

Source: Burning Glass – Labor Insights

Exhibit 6 displays the employers that posted the most job ads for the data analytics occupational group in the region over the last 12 months. Showing employer names provides insight into where students may find employment after completing a program. Anthem Blue Cross posted the most job ads in the region for the data analytics occupational group over the last 12 months, primarily seeking business information analysts.

Exhibit 6: Employers posting the most job ads for the data analytics occupational group over the last 12 months, Inland Empire/Desert Region, November 2021 – October 2022

Top Employers	Job Ads
Anthem Blue Cross	38
Inland Empire Health Plans	24
University of California, Riverside	14
Riverside County	13
Yaamava' Resort and Casino at San Manuel	12
Ryder Systems Incorporated	11
Monster Beverage Corporation	10
Kaiser Permanente	9
ProSites, Inc.	9
Nordstrom, Inc.	8
San Bernardino County	6
City of Riverside	6
Prime Healthcare Services	5
California Baptist University	5
All other employers	*201*
Total	**371**

Source: Burning Glass – Labor Insights

Exhibit 7 lists a sample of specialized, employability, and software and programming skills employers seek when looking for workers to fill data analytics positions. Specialized skills are occupation-specific skills that employers request for industry or job competency. Employability skills are foundational skills that transcend industries and occupations; this category is often referred to as "soft skills." The skills requested in job ads may be utilized to guide curriculum development.

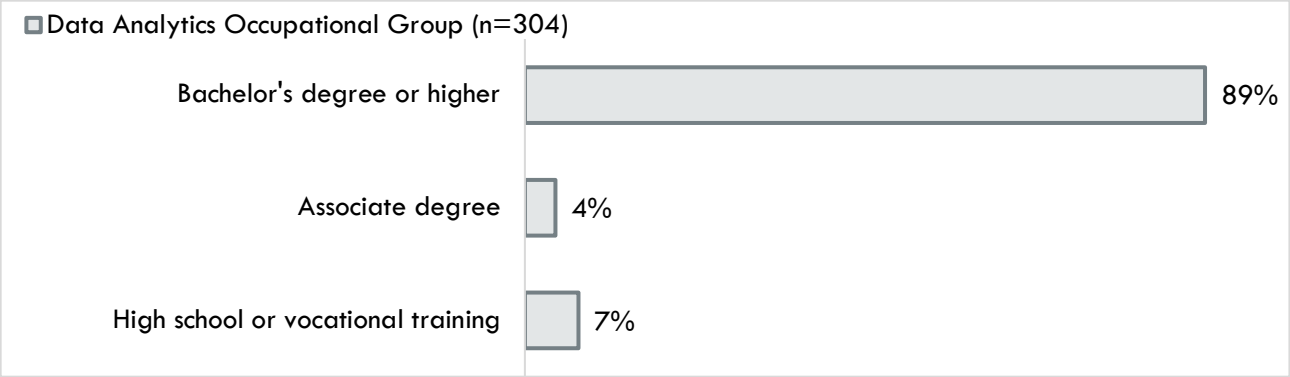
Exhibit 7: Sample of in-demand skills from employer job ads, Inland Empire/Desert Region, November 2021 – October 2022

Specialized skills *(n=371)*	Employability skills	Software and Programming skills
• Business Process • Systems Analysis • Project Management • Business Intelligence • Data Visualization • Information Systems	• Communication Skills • Problem Solving • Teamwork/Collaboration • Research • Detail-Oriented • Planning	• SQL • Microsoft Excel • Tableau • SAS (Statistical Analysis System) • Python

Source: Burning Glass – Labor Insights

Exhibit 8 displays the minimum advertised education requirements for the data analytics occupational group. Approximately 89% of job ads for the data analytics occupational group sought candidates with a bachelor's degree or higher.

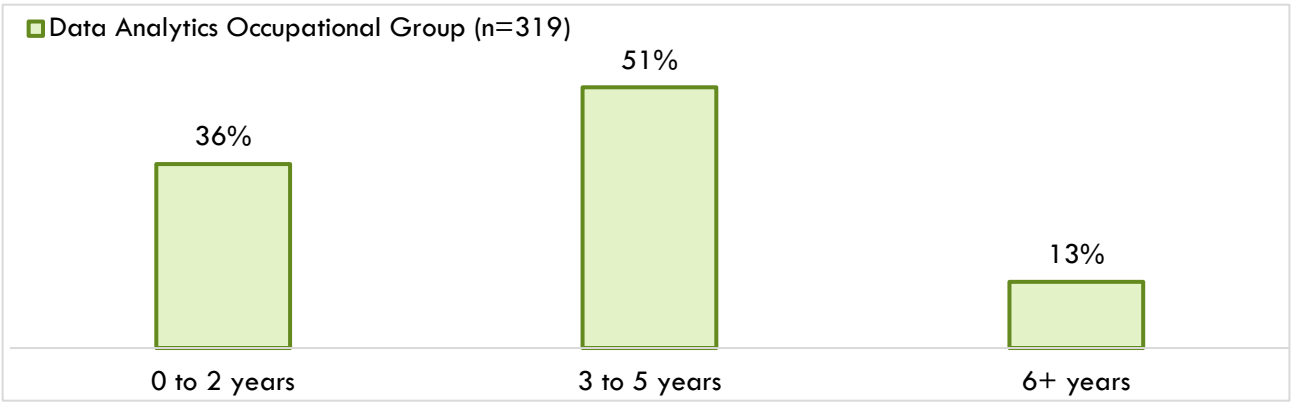
Exhibit 8: Minimum advertised education requirements, Inland Empire/Desert Region, November 2021 – October 2022



Source: Burning Glass – Labor Insights

Exhibit 9 displays the real-time work experience requirements from employer job ads for the data analytics occupational group. Most employers (51%) sought candidates with three to five years of previous work experience, indicating that employers value data analytics workers with previous work experience.

Exhibit 9: Real-time work experience requirements, Inland Empire/Desert Region, November 2021 – October 2022



Source: Burning Glass – Labor Insights

Student Completions and Programs Outcomes

Two community colleges in the region currently offer programs related to data analytics. Regional community colleges use two program codes when coding their data analytics programs. Combined, regional community college data analytics programs have issued one award annually over the last three academic years, 2019-2022. Exhibit 10 displays each regional data analytics program and award types students earn upon program completion.

Exhibit 10: Data analytics-related programs, Inland Empire/Desert Region, 2022-23 academic year

College	TOP Program (TOP Code)	Local Program Title	Award
Moreno Valley	Computer Systems Analysis (0707.30)	Data Science	A.S. Degree
		Data Analytics	Certificate
		Information Assurance Auditing	Certificate
Riverside City	Database Design and Administration (0707.20)	Data Quick Start	Certificate

Source: COCI, 2022-23 Community College Catalogs

Exhibits 11 and 12 display student completions for computer systems analysis (TOP 0707.30) and database design and administration (0707.20) programs related to data analysis over the last three academic years, 2019-2022. Over the last three academic years, 2019-2022, Moreno Valley College has not issued any known awards in computer systems analysis programs. Riverside City College's database design and administration program has issued two awards over the previous three academic years, all in the 2019-2020 academic year. Program completion and student outcome methodologies can be found in the appendix.

Exhibit 11: Annual average community college awards for computer systems analysis programs related to data analysis, Inland Empire/Desert Region, Academic Years 2019-2022

TOP 0707.30 – Computer Systems Analysis (Local Program Title)	**Academic Year 2019-20**	**Academic Year 2020-21**	**Academic Year 2021-22**	**Total CC Annual Average Awards, Academic Years 2019-22**
Moreno Valley (Data Analytics/Data Science/Information Assurance Auditing)				**0**
Associate Degree	0	0	0	0
Certificate 30 < 60 semester units	0	0	0	0
Certificate 16 < 30 semester units	0	0	0	0
Total	**0**	**0**	**0**	**0**

Source: MIS Data Mart, COCI

Exhibit 12: Annual average community college awards for database design and administration programs related to data analysis, Inland Empire/Desert Region, Academic Years 2019-2022

TOP 0707.20 – Database Design and Administration (Local Program Title)	**Academic Year 2019-20**	**Academic Year 2020-21**	**Academic Year 2021-22**	**Total CC Annual Average Awards, Academic Years 2019-22**
Riverside City (Data Quick Start)				**1**
Certificate 6 < 18 semester units	2	0	0	1
Total	**2**	**0**	**0**	**1**

Source: MIS Data Mart, COCI

California program outcome data may provide useful insight into the likelihood of success for the proposed program. Community college student outcome information based on the selected TOP code and region is provided in Exhibits 13 and 14.

Exhibit 13: 0707.30 – Computer systems analyst strong workforce program outcomes, Inland Empire/Desert Region, Academic Year 2019-2020 (Unless Noted)

Strong Workforce Program Metrics: 0707.30 – Computer System Analyst Academic Year 2019-20, unless noted otherwise	Inland Empire/Desert Region	California
Unduplicated count of enrolled students (2020-21)	302	2,156
Completed 9+ career education units in one year (2020-21)	49%	39%
Students who completed a noncredit CTE or workforce preparation course (2020-21)	-	96%
Students who earned a degree, certificate, or attained apprenticeship (2020-21)	-	149
Transferred to a four-year institution (transfers)	17	213
Job closely related to the field of study (2018-19)	-	62%
Median annual earnings (all exiters)	$36,016	$37,580
Median change in earnings (all exiters)	-21%	17%
Attained a living wage (completers and skills-builders)	58%	53%

Sources: LaunchBoard Community College Pipeline and Strong Workforce Program Metrics

Exhibit 14: 0707.20 – Database design and administration strong workforce program outcomes, Inland Empire/Desert Region, Academic Year 2019-2020 (Unless Noted)

Strong Workforce Program Metrics: 0707.20 – Database Design and Administration Academic Year 2019-20, unless noted otherwise	Inland Empire/Desert Region	California
Unduplicated count of enrolled students (2020-21)	158	2,473
Completed 9+ career education units in one year (2020-21)	50%	48%
Students who earned a degree, certificate, or attained apprenticeship (2020-21)	-	60
Transferred to a four-year institution (transfers)	19	150
Job closely related to the field of study (2018-19)	30%	70%
Median annual earnings (all exiters)	$46,190	$67,400
Median change in earnings (all exiters)	23%	11%
Attained a living wage (completers and skills-builders)	71%	71%

Sources: LaunchBoard Community College Pipeline and Strong Workforce Program Metrics

Other postsecondary institutions may utilize the data analytics, general CIP code (30.7101) for their data analytics programs. However, over the last three academic years, no other regional postsecondary education

institution issued awards using this program code. The following is the program description for data analytics, general CIP programs.

> *A program that prepares individuals to apply data science to generate insights from data and identify and predict trends. Includes instruction in computer databases, computer programming, inference, machine learning, optimization, probability and stochastic models, statistics, strategy, uncertainty quantification, and visual analytics (IPEDS, 2022).*

Summary of Findings

Employment for the data analytics occupational group is expected to increase by 7% through 2026, with 252 job openings projected annually. The 10th percentile hourly earnings for the data analytics occupational group are higher than the living wage standard, indicating that at least 90% of these workers earn a living wage.

Community colleges use two program codes when coding their data analytics programs, database design and administration (TOP 0707.20) and computer systems analysis (TOP 0707.30). Combined, regional community college programs related to data analytics have issued one award annually over the last three academic years, 2019-2022. Other regional postsecondary education institutions have not issued awards in data analytics, general (CIP 30.7101) programs.

The Centers of Excellence recommends expanding occupational training for the data analytics occupational group due to increasing employer demand and strong wages associated with these occupations. Colleges considering this program should partner with applicable employers to document their demand for the data analytics occupational group exiting a community college data analytics program.

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Appendix: Occupation definitions, sample job titles, five-year projections, and earnings for data analytics occupations

Occupation Definitions* (SOC code), *Education and Training Requirements, Community College Education Attainment

Computer Systems Analysts (SOC 15-1211)

Analyze science, engineering, business, and other data processing problems to develop and implement solutions to complex applications problems, system administration issues, or network concerns. Perform systems management and integration functions, improve existing computer systems, and review computer system capabilities, workflow, and schedule limitations. May analyze or recommend commercially available software.

Sample job titles: Applications Analyst, Business Systems Analyst, Computer Analyst, Computer Systems Analyst, Computer Systems Consultant, Information Systems Analyst (ISA), Information Technology Analyst (IT Analyst), System Analyst, Systems Analyst

Entry-Level Educational Requirement: Bachelor's degree

Work Experience Required: None

Training Requirement: None

Incumbent workers with a Community College Award or Some Postsecondary Coursework: 21%

Data Scientists (15-2051)

Develop and implement a set of techniques or analytics applications to transform raw data into meaningful information using data-oriented programming languages and visualization software. Apply data mining, data modeling, natural language processing, and machine learning to extract and analyze information from large structured and unstructured datasets. Visualize, interpret, and report data findings. May create dynamic data reports.

Sample job titles: Business Intelligence Analyst, Competitive Intelligence Analyst, Data Analyst, Intelligence Analyst, Market Intelligence Analyst, Market Intelligence Consultant, Strategic Business and Technology Intelligence Consultant, Strategist

Entry-Level Educational Requirement: Bachelor's degree

Work Experience Required: None

Training Requirement: None

Incumbent workers with a Community College Award or Some Postsecondary Coursework: 11%

Methodology

Exhibits 11 and 12 display the average annual California Community College (CCC) awards conferred during the three academic years between 2019 and 2022 from the California Community Colleges Chancellor's Office Management Information Systems (MIS) Data Mart. Awards are the combined total of associate degrees and certificates issued during the timeframe, divided by three in this case to calculate an annual average. This is done to minimize the effect of atypical variations that might be present in a single year.

Community college student outcome information is from LaunchBoard and based on the selected TOP code and region. These metrics are based on records submitted to the California Community Colleges Chancellor's Office Management Information Systems (MIS) by community colleges, which come from self-reported student information from CCC Apply and the National Student Clearinghouse. Employment and earnings metrics are sourced from California's Employment Development Department's Unemployment Insurance database records. When available, outcomes for completers are reported to demonstrate the impact that earning a degree or certificate can have on employment and earnings. For more information on the types of students included for each metric, please see the web link for LaunchBoard's Strong Workforce Program Metrics Data Element Dictionary in the References section (LaunchBoard, 2022a). Finally, employment in a job closely related to the field of study comes from self-reported student responses on the CTE Employment Outcomes Survey (CTEOS), administered by Santa Rosa Junior College (LaunchBoard, 2022a).

Job ad data is limited to the information provided by employers and the ability of artificial intelligence search engines to identify this information. Additionally, preliminary calculations by Georgetown Center on Education and the Workforce found that "just 30 to 40 percent of openings for candidates with some college or an associate degree, and only 40 to 60 percent of openings for high school diploma holders appear online" (Carnevale et al., 2014). Online job ads often do not reveal employers' hiring intentions; it is unknown if employers plan to hire one or multiple workers from a single online job ad or collecting resumes for future hiring needs. A closed job ad may not be the result of a hired worker.

Table 1. 2021 to 2026 job growth, wages, entry-level education, training, and work experience required for data analytics occupations in the Inland Empire/Desert Region (Riverside and San Bernardino counties combined)

Occupation (SOC)	2021 Jobs	5-Year Change	5-Year % Change	Annual Openings (New + Replacement Jobs)	Entry-Experienced Hourly Wage (10th to 90th percentile)	Median Hourly Wage (50th percentile)	Average Annual Earnings	Entry-Level Education & On-The-Job-Training	Work Experience Required
Computer Systems Analysts (15-1211)	2,585	142	6%	212	$27.89 to $65.20	$45.68	$96,800	Bachelor's degree & None	None
Data Scientists (15-2051)	361	62	17%	40	$22.31 to $76.65	$46.74	$99,500	Bachelor's degree & None	None
Total	**2,947**	**204**	**7%**	**252**	**-**	**-**	**-**	**-**	**-**

Source: Lightcast 2022.3