Computer Information Systems: Data Science

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

Summary

- Employment for the data science occupational group is expected to **increase by 7% between 2018 and 2023** in the Inland Empire/Desert region (IEDR). A total of **4,943 job openings or 989 annual job openings** will be available over the five-year timeframe.
- The **entry-level wages** (25th percentile) for the data science occupational group are **above the MIT Living Wage estimate of $12.39 per hour** for a single adult living in the IEDR.
- **There appears to be an opportunity for program growth** because there are more annual job openings for the data science occupational group **(989 average annual openings)** than annual credentials issued for the selected community college programs in the region **(152 annual average community college credentials, 82 other educational institution credentials, 234 total).**

Introduction

This report provides information on the occupations related to the California Community College computer information systems (TOP 0702.00), database design and administration (TOP 0707.20), and computer systems analysis (TOP 0707.30) programs. Descriptions and student completion information for these programs being on page 7. While there are entry-level positions within data science, the majority of occupations in this field require a bachelor's degree to enter employment. The data science occupational group has been split into **middle-skill occupations**, and **above middle-skill occupations** illuminate the opportunities available to students with various levels of educational attainment.

The **middle-skill** data science occupational group consists of two entry-level data analyst occupations that typically require workers to obtain some postsecondary education. The occupations included in the middle-skill data science occupational group are:

- Computer Network Support Specialists
- Computer User Support Specialists

The **above middle-skill** data science occupational group consists of six occupations that typically require workers to obtain a bachelor's degree. The occupations included in the above middle-skill data science occupational group are:

- Computer Network Architects
- Computer Occupations, All Other
- Computer Systems Analysts
- Database Administrators
- Information Security Analysts
- Network and Computer Systems Administrators

Job Opportunities

In 2018, there were 11,884 jobs in the data science occupational group in the Inland Empire/Desert region (IEDR). Jobs in this occupational group are projected to increase by 7% by 2023. Regional employers will have 4,943 job openings over the next five years; this figure includes new jobs and jobs that need to be replaced due to workers permanently leaving their jobs (includes occupational transfers and retirements). Exhibit 1 displays five-year projections for the data science occupational group in the IEDR.

Exhibit 1: Five-year projections for the data science occupational group

Occupational Group	2018 Jobs	5-Yr % Change (New Jobs)	5-Yr Openings (New + Replacement Jobs)	Annual Openings (New + Replacement Jobs)	% of workers age 55+
Above Middle-skill	6,917	6%	2,713	543	17%
Middle-skill	4,966	8%	2,230	446	16%
Total	**11,884**	**7%**	**4,943**	**989**	**16%**

Source: EMSI 2019.2

Earnings

The entry-level wages for the data science occupational group are above the MIT Living Wage estimate of $12.39 per hour for a single adult living in the IEDR (Glasmeier, 2019). These wages are also sufficient for two working adults and one child ($14.75 per hour, per adult, or $30,680 annually for each adult). Exhibit 2 displays wage information for the data science occupational group in the IEDR.

Exhibit 2: Earnings for the data science occupational group

Occupational Group	Occupation	Entry to Experienced Hourly Wage Range (25th to 75th percentile)	Median Wage (50th percentile)	Average Annual Earnings
Above Middle-skill	Information Security Analysts	$29.72 to $59.66	$47.35	$96,400
	Computer Network Architects	$34.69 to $60.28	$44.32	$99,200
	Database Administrators	$30.24 to $51.18	$41.31	$85,200
	Computer Systems Analysts	$30.15 to $45.50	$36.91	$78,900
	Computer Occupations, All Other	$27.18 to $48.53	$36.90	$79,400

Occupational Group	Occupation	Entry to Experienced Hourly Wage Range (25th to 75th percentile)	Median Wage (50th percentile)	Average Annual Earnings
	Network and Computer Systems Administrators	$28.88 to $45.80	$36.20	$77,900
Middle-skill	Computer Network Support Specialists	$24.77 to $40.00	$29.74	$68,300
	Computer User Support Specialists	$20.34 to $30.60	$25.87	$54,400

Source: EMSI 2019.2

Job Postings, Employers, Skills, and Education

Exhibit 3 displays the number of job ads posted during the last 12 months along with the regional and statewide average time to fill for the data science occupational group in the IEDR. On average, local employers fill online job postings for the data science occupational group within 45 days. This regional average is three days longer than the statewide average, indicating that it is only slightly more difficult for local employers to find qualified candidates.

Exhibit 3: Job ads and time to fill, Apr 2018 – Mar 2019

Occupational Group	Occupation	Job Ads	Regional Average Time to Fill (Days)	California Average Time to Fill (Days)
Above Middle-Skill	Computer Occupations, All Other	2,780	48	44
	Computer Systems Analysts	761	45	42
	Network and Computer Systems Administrators	497	41	39
	Database Administrators	382	45	41
	Computer Network Architects	374	49	45
	Information Security Analysts	328	48	44
Middle-skill	Computer User Support Specialists	1,498	39	35
	Computer Network Support Specialists	91	39	35
	Total	**6,711**	**45**	**42**

Source: Burning Glass – Labor Insights

Exhibit 4 displays the employers posting the most job ads for the data science occupational group during the last 12 months in the IEDR.

Exhibit 4: Employers posting the most job ads, Apr 2018 – Mar 2019

Occupational Group	Occupation	Employers
Above Middle-Skill	Computer Occupations, All Other *(n=1,898)*	• Anthem Blue Cross • Esri
	Computer Systems Analysts *(n=571)*	• Esri • San Bernardino County
	Network and Computer Systems Administrators *(n=328)*	• Booz Allen Hamilton, Inc. • Esri
	Database Administrators *(n=222)*	• Esri • Niagara Bottling, LLC
	Computer Network Architects *(n=183)*	• San Bernardino Community College • Niagara Bottling, LLC
	Information Security Analysts *(n=214)*	• Esri • Anthem Blue Cross
Middle-Skill	Computer User Support Specialists *(n=1,037)*	• Best Buy • Niagara Bottling, LLC
	Computer Network Support Specialists *(n=72)*	• Anthem Blue Cross • San Bernardino County

Source: Burning Glass – Labor Insights

Exhibit 5 displays a sample of specialized, employability, and software and programming skills that employers are seeking when looking for workers to fill positions in the data science occupational group. Specialized skills are occupation-specific skills that employers are requesting for industry or job competency. Employability skills are foundational skills that transcend industries and occupations; this category is commonly referred to as "soft skills." The skills requested in job postings may be utilized as a helpful guide for curriculum development.

Exhibit 5: Sample of in-demand skills from employer job ads for the data science occupational group, Apr 2018 – Mar 2019

Occupational Group	Occupation	Specialized Skills	Employability Skills	Software and Programming Skills
Above Middle-Skill	Computer Occupations, All Other *(n=2,530)*	• Project Management • Quality Assurance and Control • Data Analysis	• Communication Skills • Problem Solving • Teamwork/ Collaboration	• SQL • Microsoft Office • Python
	Computer Systems Analysts *(n=713)*	• Project Management • Business Process • Information Systems	• Communication Skills • Problem Solving • Planning	• SQL • Microsoft Office • SAP
	Network and Computer Systems Administrators *(n=467)*	• Technical Support • Wide Area Network (WAN) • Scheduling	• Troubleshooting • Planning • Communication Skills	• VMware • Linux • Windows Server
	Database Administrators *(n=362)*	• Data Warehousing • Extraction Transformation and Loading (ETL) • Performance Tuning	• Troubleshooting • Communication Skills • Problem Solving	• SQL • Teradata • SQL Server
	Computer Network Architects *(n=339)*	• Telecommunications • Project Management • Technical Support	• Communication Skills • Troubleshooting • Teamwork/ Collaboration	• Voice over IP (VoIP) • Cisco Switching • Virtual Private Networking (VPN)
	Information Security Analysts *(n=293)*	• Information Systems • Intrusion Detection & Authentication • Disaster Recovering Planning	• Communication Skills • Planning • Teamwork/ Collaboration	• Linux • Python • Microsoft Office
Middle-Skill	Computer User Support Specialists *(n=1,386)*	• Repair • Customer Service • Hardware and Software Installation	• Troubleshooting • Communication Skills • Problem Solving	• Microsoft Office • SQL
	Computer Network Support Specialists *(n=85)*	• Network Administration • Customer Service • Information Systems	• Troubleshooting • Problem Solving • Communication Skills	• Microsoft Office • UNIX • Virtual Private Networking (VPN)

Source: Burning Glass – Labor Insights

Exhibit 6 displays the work experience and entry-level education typically required to enter each occupation according to the Bureau of Labor Statistics (BLS), educational attainment for incumbent workers with "some college, no degree" and an "associate degree" according to the U.S. Census (2016-17), and the minimum advertised education requirement from employer job ads. The education and work experience typically required for above middle-skill occupations is above the line. The last two occupations below the line are middle-skill jobs.

Exhibit 6: Work experience, typical entry-level education, educational attainment, and minimum advertised education requirements for the data science occupational group, Apr 2018 – Mar 2019

Occupation	Work Experience Required	Typical Entry-Level Education Requirement	Educational Attainment*	Minimum Advertised Education Requirement from Job Ads			
				Number of Job Ads (n=)	High school diploma or vocational training	Associate degree	Bachelor's degree or higher
Computer Occupations, All Other	None	Bachelor's degree	35%	*1,796*	19%	6%	75%
Computer Systems Analysts	None	Bachelor's degree	21%	*518*	14%	6%	80%
Network and Computer Systems Administrators	None	Bachelor's degree	38%	*297*	20%	6%	74%
Database Administrators	None	Bachelor's degree	22%	*233*	14%	7%	79%
Computer Network Architects	*5* years or more	Bachelor's degree	35%	*196*	12%	7%	81%
Information Security Analysts	Less than *5* years	Bachelor's degree	28%	*242*	22%	9%	69%
Computer User Support Specialists	None	Some college, no degree	41%	*720*	46%	17%	37%
Computer Network Support Specialists	None	Associate degree	41%	*61*	29%	12%	59%

Source: EMSI 2019.2, Burning Glass – Labor Insights

*Percentage of incumbent workers with a Community College Credential or Some Postsecondary Coursework

Student Completions and Program Outcomes

This section contains completion and outcome data for the California Community College computer information systems (TOP 0702.00), database design and administration (TOP 0707.20), and computer systems analysis (TOP 0707.30) programs. Exhibits 7, 9, and 11 display the average annual regional California Community College (CCC) credentials conferred during the three academic years between 2014 and 2017, from the California Community Colleges Chancellor's Office Management Information Systems (MIS) Data Mart, along with enrollments from the most recent year available on LaunchBoard. Credentials are the combined total of associate degrees and certificates issued during the timeframe, divided by three in this case in order to calculate an annual average. This is done to minimize the effect of atypical variation that might be present in a single year. Enrollments are the count of enrollments in courses assigned to the TOP code in the selected year. The relevant TOP code is from the Taxonomy of Programs manual, and the corresponding program titles used at each college (in *italics*) is sourced from the Chancellor's Office Curriculum Inventory (COCI). Please note, a credential is not always equal to a single person in search of a job opening since a student may earn more than one credential, such as an associate degree in addition to a certificate.

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 comes from self-reported student information from CCC Apply and the National Student Clearinghouse. Employment and earnings metrics are sourced from records provided by California's Employment Development Department's Unemployment Insurance database. When available, outcomes for completers are reported in order 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, 2019a). 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, 2017). Data from the latest academic year for each metric is provided in Exhibits 8, 10, and 12.

Program descriptions are sourced from the California Community Colleges Taxonomy of Programs. Descriptions for the programs included in this report are the following:

Computer Information Systems (TOP 0702.00): General programs in data and information storage and processing, including hardware, software, basic design principles, and user requirements.

Exhibit 7: Annual average community college credentials and enrollments for the computer information systems program in the Inland Empire/Desert Region

0702.00 – Computer Information Systems	CCC Enrollments, Academic Year 2016-17	CCC Annual Average Credentials, Academic Years 2014-17
Barstow – *Computer Information Systems/Computer Science/Information Systems Management*	351	
Associate Degree		1
Chaffey – *Computer Information Systems*	1,841	
Associate Degree		21
Certificate 30 to < 60 semester units		6
Copper Mountain – *Computer Information Systems*		
Associate Degree		4
Crafton Hills – *Computer Information Systems*		
Associate Degree		8
Certificate 18 to < 30 semester units		1
Certificate 6 to < 18 semester units		3
Desert – *Computer Information Systems*	1,658	
Associate Degree		3
Certificate 30 to < 60 semester units		2
Moreno Valley	587	
Mt. San Jacinto – *Computer Information Systems*	606	
Associate Degree		21
Certificate 30 to < 60 semester units		2
Norco	665	
Palo Verde – *Computer Information Systems*		
Associate Degree		1
Certificate 6 to < 18 semester units		58
Riverside	1,506	
San Bernardino – *Computer Science*	140	
Associate Degree		7
Certificate 18 to < 30 semester units		1
Victor Valley – *Computer Information Systems*	35	
Associate Degree		14
Total CCC Enrollments, Academic Year 2016-17	**7,389**	
Total Annual Average CCC Credentials, Academic Years 2014-17		**152**

Source: LaunchBoard, MIS Data Mart, COCI

Exhibit 8: Computer information systems strong workforce program outcomes

Strong Workforce Program Metrics: 0702.00 – Computer Information Systems Academic Year 2015-16, unless noted otherwise	Inland Empire/Desert Region	California Median
Course enrollments (2016-17)	7,389	293
Completed 12+ units in one year (2016-17)	897	43
Economically disadvantaged students* (2016-17)	73%	75%
Transferred to a four-year institution (transfers)	547	48
Employed in the fourth fiscal quarter after exit (completers)	53%	68%
Median annual earnings* (completers)	$27,906	$29,465
Job closely related to the field of study (2014-15)	72%	73%
Median change in earnings (completers)	65%	111%
Attained a living wage (completers and skills-builders)	48%	57%

Source: LaunchBoard
*Data for these metrics is available in Community College Pipeline. All others are available in Strong Program Workforce Metrics.

Database Design and Administration (TOP 0707.20): Development of database applications in a business or organizational environment, including database architecture, programming languages, proprietary database software, and related skills and techniques.

Exhibit 9: Annual average community college credentials and enrollments for the database design and administration program in the Inland Empire/Desert Region

0707.20 – Database Design and Administration	CCC Enrollments, Academic Year 2016-17	CCC Annual Average Credentials, Academic Years 2014-17
Chaffey	21	
Mt. San Jacinto	19	
Riverside	72	
Certificate 6 to < 18 semester units		1*
Victor Valley – *MySQL Database Developer*	67	
Total CCC Enrollments, Academic Year 2016-17	**179**	
Total Annual Average CCC Credentials, Academic Years 2014-17		**1**

Source: LaunchBoard, MIS Data Mart, COCI
*Riverside issued one 6 to <18 semester unit certificate in 2015-16.

Exhibit 10: Database design and administration strong workforce program outcomes

Strong Workforce Program Metrics: 0707.20 – Database Design and Administration Academic Year 2015-16, unless noted otherwise	Inland Empire/Desert Region	California Median
Course enrollments (2016-17)	179	31
Completed 12+ units in one year (2016-17)	49	18
Economically disadvantaged students* (2016-17)	84%	65%
Transferred to a four-year institution (transfers)	14	11
Employed in the fourth fiscal quarter after exit (all exiters)	61%	78%
Median annual earnings* (all exiters)	$25,898	$52,733
Job closely related to the field of study (2014-15)	100%	100%
Median change in earnings (all exiters)	45%	39%
Attained a living wage (completers and skills-builders)	N/A	78%

Source: LaunchBoard
*Data for these metrics is available in Community College Pipeline. All others are available in Strong Program Workforce Metrics.

Computer Systems Analysis (TOP 0707.30): Systems analysis and design, including the recognition, definition, and improvement of processes through the use of computer technology and methodologies.

The IEDR does not have any reported completions in TOP 0707.30 Computer Systems Analysis. Exhibit 16 displays the enrollments from the most recent year available on LaunchBoard for computer systems analysis in the IEDR.

Exhibit 11: Enrollments for the computer systems analysis program in the Inland Empire/Desert Region

0707.30 – Computer Systems Analysis	CCC Enrollments, Academic Year 2016-17
Moreno Valley – *Information Assurance Auditing*	45
Mt. San Jacinto	33
Norco	28
Palo Verde	126
Riverside	36
Total CCC Enrollments, Academic Year 2016-17	**268**

Source: LaunchBoard, COCI

Exhibit 12: Computer systems analysis strong workforce program outcomes

Strong Workforce Program Metrics: 0707.30 – Computer Systems Analysis Academic Year 2015-16, unless noted otherwise	Inland Empire/Desert Region	California Median
Course enrollments (2016-17)	268	38
Completed 12+ units in one year (2016-17)	66	18
Economically disadvantaged students* (2016-17)	86%	78%
Transferred to a four-year institution (transfers)	20	0
Employed in the fourth fiscal quarter after exit (all exiters)	35%	75%
Median annual earnings* (all exiters)	$16,910	$22,070
Job closely related to the field of study (2014-15)	N/A	80%
Median change in earnings (all exiters)	N/A	38%
Attained a living wage (all exiters)	N/A	62%

Source: LaunchBoard
*Data for these metrics is available in Community College Pipeline. All others are available in Strong Program Workforce Metrics.

Credentials granted from other educational providers outside of the California Community College system are displayed in Exhibit 13, along with the relevant CIP code. This is the final release data compiled from the Integrated Postsecondary Education Data System (IPEDS) for the most recent three years available.

Exhibit 13: Annual average other educational providers credentials awarded for computer systems analysis/analyst programs

11.0501 – Computer Systems Analysis/Analyst	Other Educational Providers Annual Average Credentials, Academic Years 2013-16
Computer Training Academy	
Award <1 academic yr	82
Total Annual Average Other Credentials, Academic Years 2013-16	**82**

Source: IPEDS

Job Postings, Employers, Skills, Education, and Advertised Salary for Data Science Occupations with Data Analysis Skills

A real-time search of job advertisements for the data analysis occupational group, which is composed of the data science occupational group with data analysis skills, was conducted in order to determine the demand for "data analysis skills" in the IEDR. Exhibit 14 displays the number of job ads posted during the last 12 months along with the regional and statewide average time to fill for the data analysis occupational group in the IEDR. On average, local employers fill online job postings for the data analysis occupational group within 46 days. This regional average is four days longer than the statewide average, indicating that it is only slightly more difficult for local employers to find qualified candidates. The skills used to focus the job ad search are the following:

- Data Analysis
- LAN/WAN Problem Analysis
- Object-Oriented Analysis and Design (OOAD)
- Performance Analysis
- Systems Analysis
- Vulnerability Analysis

Exhibit 14: Job ads and time to fill, Apr 2018 – Mar 2019

Occupational Group	Occupation	Job Ads	Regional Average Time to Fill (Days)	California Average Time to Fill (Days)
Above Middle-Skill	Computer Occupations, All Other	456	48	44
	Computer Systems Analysts	228	45	42
	Database Administrators	42	45	41
	Network and Computer Systems Administrators	34	41	39
	Information Security Analysts	27	48	44
	Computer Network Architects	15	49	45
Middle-skill	Computer User Support Specialists	66	39	35
	Computer Network Support Specialists	11	39	35
	Total	**879**	**46**	**42**

Source: Burning Glass – Labor Insights

Exhibit 15 displays the employers posting the most job ads for the data analysis occupational group during the last 12 months in the IEDR. N/A indicates that there were too few job postings to display employer information.

Exhibit 15: Employers posting the most job ads, Apr 2018 – Mar 2019

Occupational Group	Occupation	Employers
Above Middle-Skill	Computer Occupations, All Other *(n=311)*	• Anthem Blue Cross • Revature
	Computer Systems Analysts *(n=177)*	• Anthem Blue Cross • San Bernardino County
	Database Administrators *(n=29)*	• Niagara Bottling, LLC. • Atrilogy Solutions Group
	Network and Computer Systems Administrators *(n=27)*	• San Manuel Band of Mission Indians • City of Rialto
	Information Security Analysts *(n=21)*	• California State University, San Bernardino • Riverside County
	Computer Network Architects *(n=10)*	• N/A
Middle-Skill	Computer User Support Specialists *(n=48)*	• Riverside County • VSolvit
	Computer Network Support Specialists *(n=11)*	• United States Air Force • UnitedHealth Group

Source: Burning Glass – Labor Insights

Exhibit 16 displays a sample of specialized, employability, and software and programming skills that employers are seeking when looking for workers to fill positions in the data analysis occupational group. Specialized skills are occupation-specific skills that employers are requesting for industry or job competency. Employability skills are foundational skills that transcend industries and occupations; this category is commonly referred to as "soft skills." The skills requested in job postings may be utilized as a helpful guide for curriculum development.

Exhibit 16: Sample of in-demand skills from employer job ads for the data analysis occupational group, Apr 2018 – Mar 2019

Occupational Group	Occupation	Specialized Skills	Employability Skills	Software and Programming Skills
Above Middle-Skill	Computer Occupations, All Other *(n=456)*	• Data Analysis • Project Management • Relational Databases	• Problem Solving • Communication Skills • Teamwork/ Collaboration	• SQL • Microsoft Office • SAS
	Computer Systems Analysts *(n=223)*	• Information Systems • Project Management • Business Process	• Problem Solving • Communication Skills • Research	• SQL • Microsoft Office • Oracle
	Database Administrators *(n=42)*	• Data Analysis • Data Warehousing • Business Intelligence	• Communication Skills • Problem Solving • Detail-Oriented	• SQL • Oracle • Microsoft Office
	Network and Computer Systems Administrators *(n=34)*	• Information Systems • Performance Analysis • Systems Analysis	• Troubleshooting • Writing • Planning	• SQL • Microsoft SharePoint • Microsoft PowerShell
	Information Security Analysts *(n=27)*	• Disaster Recovery Planning • Systems Analysis • Authentication	• Communication Skills • Planning • Problem Solving	• Linux • Java • Microsoft PowerShell
	Computer Network Architects *(n=15)*	• Systems Analysis • Telecommunications • Scheduling	• Communication Skills • Troubleshooting • Problem Solving	• Java • Object-Oriented Analysis and Design (OOAD) • Software Development
Middle-Skill	Computer User Support Specialists *(n=66)*	• Data Analysis • Customer Service • Systems Analysis	• Problem Solving • Troubleshooting • Communication Skills	• SQL • C++ • Java
	Computer Network Support Specialists *(n=11)*	• Information Systems • Performance Analysis • Configuration Management	• Planning • Detail-Oriented • Oral Communication	• NetApp • Microsoft Project • Windows Server

Source: Burning Glass – Labor Insights

Exhibit 17 displays the work experience and entry-level education typically required to enter each occupation according to the Bureau of Labor Statistics (BLS), educational attainment for incumbent workers with "some college, no degree" and an "associate degree" according to the U.S. Census (2016-17), and the minimum advertised education requirement from employer job ads. The education and work experience typically required for above middle-skill occupations is above the line. The last two occupations below the line are middle-skill jobs.

Exhibit 17: Work experience, typical entry-level education, educational attainment, and minimum advertised education requirements for the data analysis occupational group, Apr 2018 – Mar 2019

Occupations	Work Experience Required	Typical Entry-Level Education Requirement	Educational Attainment*	Minimum Advertised Education Requirement from Job Ads			
				Number of Job Ads (n=)	High school diploma or vocational training	Associate degree	Bachelor's degree or higher
Computer Occupations, All Other	None	Bachelor's degree	35%	*389*	12%	2%	86%
Computer Systems Analysts	None	Bachelor's degree	21%	*176*	9%	8%	83%
Database Administrators	None	Bachelor's degree	22%	*31*	6%	7%	87%
Network and Computer Systems Administrators	None	Bachelor's degree	38%	*22*	14%	-	86%
Information Security Analysts	Less than 5 years	Bachelor's degree	28%	*23*	4%	9%	87%
Computer Network Architects	5 years or more	Bachelor's degree	35%	*7*	57%	-	43%
Computer User Support Specialists	None	Some college, no degree	41%	*52*	37%	4%	59%
Computer Network Support Specialists	None	Associate degree	41%	*10*	10%	10%	80%

Source: EMSI 2019.2, Burning Glass – Labor Insights

*Percentage of incumbent workers with a Community College Credential or Some Postsecondary Coursework

Exhibit 18 displays advertised salary data from real-time job postings over the last 12 months. The mean real-time salary for the data analysis occupational group is $77,000 in the IEDR. Please note that salary figures are prorated to reflect full-time, annual wage status. For reference, the MIT Living Wage estimate for a single adult living in the IEDR is $12.39 per hour, or $25,775 annually (Glasmeier, 2019). N/A indicates that there were too few job postings to obtain median wage data.

Exhibit 18: Advertised salary information for data analysis occupations, Apr 2018 – Mar 2019

Occupations	Real-Time Salary Information					
	Number of job postings	Median Wage	Less than $35,000	$35,000 to $49,999	$50,000 to $74,999	More than $75,000
Computer Occupations, All Other	*87*	$73,000	7%	22%	23%	48%
Computer Systems Analysts	*97*	$79,000	3%	1%	29%	67%
Database Administrators	*5*	N/A	-	-	-	-
Network and Computer Systems Administrators	*10*	N/A	-	10%	40%	50%
Information Security Analysts	*23*	$89,000	-	-	31%	69%
Computer Network Architects	*4*	N/A	-	-	-	-
Computer User Support Specialists	*23*	$66,00	4%	22%	30%	44%
Computer Network Support Specialists	*11*	N/A	-	-	44%	56%

Source: Burning Glass – Labor Insights

References

Burning Glass Technologies. (2019). *Labor Insights/Jobs*. Retrieved from https://www.burning-glass.com/

California Community Colleges Chancellor's Office. LaunchBoard. (2019). *California Community Colleges LaunchBoard*. Retrieved from https://www.calpassplus.org/Launchboard/Home.aspx

California Community Colleges Chancellor's Office. LaunchBoard. (2019a). *Strong Workforce Program Metrics Data Element Dictionary*. Pg. 3. Retrieved from https://www.calpassplus.org/MediaLibrary/calpassplus/launchboard/Documents/SWP-DED.PDF

California Community Colleges Chancellor's Office Management Information Systems (MIS) Data Mart. (2019). *Data Mart*. Retrieved from https://datamart.cccco.edu/datamart.aspx

California Community Colleges Chancellor's Office, Curriculum and Instructional Unit, Academic Affairs Division. (2012). *Taxonomy of Programs, 6th Edition, Corrected Version*. Retrieved from http://extranet.cccco.edu/Portals/1/AA/Credit/2013Files/TOPmanual6_2009_09corrected_12.5.13.pdf

Economic Modeling Specialists International (EMSI) (2019). *Datarun 2019.2*. Retrieved from https://www.economicmodeling.com/

Glasmeier, A. Massachusetts Institute of Technology (MIT). (2019). Retrieved from http://livingwage.mit.edu/

National Center for O*NET Development. (2019). *O*NET OnLine*. Retrieved from https://www.onetonline.org/

Contact

Michael Goss, Director
Center of Excellence, Inland Empire/Desert Region
michael.goss@chaffey.edu
May 2019

Appendix: Occupation definitions, sample job titles, five-year projections for data science occupations

Occupation Definitions (SOC) code), Education and Training Requirement, Community College Educational Attainment

Above Middle-Skill Occupations

Computer Systems Analysts (15-1121)

Analyze science, engineering, business, and other data processing problems to implement and improve computer systems. Analyze user requirements, procedures, and problems to automate or improve existing systems and review computer system capabilities, workflow, and scheduling limitations. May analyze or recommend commercially available software.

Sample job titles: Applications Analyst, Business 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
Training Requirement: None
Incumbent workers with a Community College Award or Some Postsecondary Coursework: 21%

Information Security Analysts (15-1122)

Plan, implement, upgrade, or monitor security measures for the protection of computer networks and information. May ensure appropriate security controls are in place that will safeguard digital files and vital electronic infrastructure. May respond to computer security breaches and viruses.

Sample job titles: Data Security Administrator, Information Security Officer, Information Security Specialist, Information Systems Security Analyst, Information Systems Security Officer, Information Technology Security Analyst (IT Security Analyst), Information Technology Specialist, Network Security Analyst, Security Analyst, Systems Analyst

Entry-Level Educational Requirement: Bachelor's degree
Training Requirement: None
Incumbent workers with a Community College Award or Some Postsecondary Coursework: 28%

Database Administrators (15-1141)

Administer, test, and implement computer databases, applying knowledge of database management systems. Coordinate changes to computer databases. May plan, coordinate, and implement security measures to safeguard computer databases.

Sample job titles: Data Architect, Database Administration Manager, Database Administrator (DBA), Database Analyst, Database Coordinator, Database Developer, Database Programmer, Information Systems Manager, Management Information Systems Director (MIS Director), System Administrator

Entry-Level Educational Requirement: Bachelor's degree
Training Requirement: None
Incumbent workers with a Community College Award or Some Postsecondary Coursework: 22%

Network and Computer Systems Administrators (15-1142)

Install, configure, and support an organization's local area network (LAN), wide area network (WAN), and Internet systems or a segment of a network system. Monitor network to ensure network availability to all system users and may perform necessary maintenance to support network availability. May monitor and test Web site performance to ensure Web sites operate correctly and without interruption. May assist in network modeling, analysis, planning, and coordination between network and data communications hardware and software. May supervise computer user support specialists and computer network support specialists. May administer network security measures.

Sample job titles: Information Analyst, Information Systems Manager (IS Manager), Information Technology Specialist (IT Specialist), LAN Specialist (Local Area Network Specialist), Local Area Network Administrator (LAN Administrator), Network Administrator, Network Coordinator, Network Manager, Network Specialist, Systems Administrator

Entry-Level Educational Requirement: Bachelor's degree
Training Requirement: None
Incumbent workers with a Community College Award or Some Postsecondary Coursework: 38%

Computer Network Architects (15-1143)

Design and implement computer and information networks, such as local area networks (LAN), wide area networks (WAN), intranets, extranets, and other data communications networks. Perform network modeling, analysis, and planning. May also design network and computer security measures. May research and recommend network and data communications hardware and software.

Sample job titles: Design Engineer, Network Analyst, Network and Security Engineer, Network Consultant, Network Systems Consultant, Networking Systems and Distributed Systems Engineer, Solutions Architect, Telecommunications Analyst

Entry-Level Educational Requirement: Bachelor's degree
Training Requirement: None
Incumbent workers with a Community College Award or Some Postsecondary Coursework: 35%

Computer Occupations, All Other (15-1199)

All computer occupations not listed separately.

Sample job titles: Business Intelligence Analyst; Business Intelligence Manager; Commercial Intelligence Manager; Competitive Intelligence Analyst; Consultant, Strategic Business and Technology Intelligence; Director of Enterprise Strategy; Director of Market Intelligence; Director, Global Intelligence; Intelligence Analyst; Manager, Market Intelligence, Data Administrator, Data Architect, Data Officer, Database Architect, Database Consultant, Information Architect, Information Modeling Engineer Specialist, Information Technology Architect (IT Architect), System Engineer, Technical Operations Vice President

Entry-Level Educational Requirement: Bachelor's degree
Training Requirement: None
Incumbent workers with a Community College Award or Some Postsecondary Coursework: 35%

Middle-Skill Occupations

Computer User Support Specialists (15-1151)

Provide technical assistance to computer users. Answer questions or resolve computer problems for clients in person, or via telephone or electronically. May provide assistance concerning the use of computer hardware and software, including printing, installation, word processing, electronic mail, and operating systems.

Sample job titles: Computer Specialist, Computer Support Specialist, Computer Technician, Desktop Support Technician, Help Desk Analyst, Help Desk Technician, Information Technology Specialist (IT Specialist), Network Technician, Support Specialist, Technical Support Specialist

Entry-Level Educational Requirement: Some college, no degree
Training Requirement: None
Incumbent workers with a Community College Award or Some Postsecondary Coursework: 41%

Computer Network Support Specialists (15-1152)

Analyze, test, troubleshoot, and evaluate existing network systems, such as local area network (LAN), wide area network (WAN), and Internet systems or a segment of a network system. Perform network maintenance to ensure networks operate correctly with minimal interruption.

Sample job titles: Computer Network Specialist, IT Consultant (Information Technology Consultant), Network Engineer, Network Specialist, Network Support Specialist, Network Technical Analyst, Network Technician, Personal Computer Network Analyst, Senior IT Assistant (Senior Information Technology Assistant), Systems Specialist

Entry-Level Educational Requirement: Associate degree
Training Requirement: None
Incumbent workers with a Community College Award or Some Postsecondary Coursework: 41%

Table 1: 2018 to 2023 job growth, wages, education, training, and work experience required for the data science occupational group, Inland Empire/Desert region (middle-skill occupations appear below the line)

Occupation (SOC)	2018 Jobs	5-Yr Change	5-Yr % Change	Annual Openings (New + Replacement Jobs)	Entry to Experienced Hourly Wage Range (25th to 75th percentile)	Median Wage (50th percentile)	Average Annual Earnings	Typical Entry-Level Education & On-The-Job Training Required	Work Experience Required
Computer Systems Analysts (15-1121)	2,140	117	5%	163	$30.15 to $45.50	$36.91	$78,900	Bachelor's degree & none	None
Computer Occupations, All Other (15-1199)	1,942	111	6%	154	$27.18 to $48.53	$36.90	$79,400	Bachelor's degree & none	None
Network and Computer Systems Administrators (15-1142)	1,838	116	6%	139	$28.88 to $45.80	$36.20	$77,900	Bachelor's degree & none	None
Database Administrators (15-1141)	480	39	8%	39	$30.24 to $51.18	$41.31	$85,200	Bachelor's degree & none	None
Computer Network Architects (15-1143)	330	28	8%	28	$34.69 to $60.28	$44.32	$99,200	Bachelor's degree & none	5 years or more
Information Security Analysts (15-1122)	188	30	16%	19	$29.72 to $59.66	$47.35	$96,400	Bachelor's degree & none	Less than 5 years
Computer User Support Specialists (15-1151)	3,832	298	8%	346	$20.34 to $30.60	$25.87	$54,400	Some college, no degree & none	None
Computer Network Support Specialists (15-1152)	1,134	79	7%	100	$24.77 to $40.00	$29.74	$68,300	Associate degree & none	None
Total	**11,884**	**818**	**7%**	**989**	-	-	-	-	-

Source: EMSI 2019.2