



Computer Programming Occupation Group

Riverside-San Bernardino-Ontario MSA (Riverside and San Bernardino County combined)

Occupation Definitions and Reported Job Titles

Computer Programmers (15-1131)

Create, modify, and test the code, forms, and script that allow computer applications to run. Work from specifications drawn up by software developers or other individuals. May assist software developers by analyzing user needs and designing software solutions. May develop and write computer programs to store, locate, and retrieve specific documents, data, and information.

Sample job titles: Analyst Programmer, Applications Developer, Computer Programmer, Computer Programmer Analyst, Internet Programmer, Java Developer, Programmer, Programmer Analyst, Software Developer, Web Programmer

Software Developers, Applications (15-1132)

Develop, create, and modify general computer applications software or specialized utility programs. Analyze user needs and develop software solutions. Design software or customize software for client use with the aim of optimizing operational efficiency. May analyze and design databases within an application area, working individually or coordinating database development as part of a team. May supervise computer programmers.

Sample job titles: Application Developer, Application Integration Engineer, Applications Developer, Computer Consultant, Information Technology Analyst (IT Analyst), Software Architect, Software Developer, Software Development Engineer, Software Engineer, Technical Consultant

Software Developers, Systems software (15-1133)

Research, design, develop, and test operating systems-level software, compilers, and network distribution software for medical, industrial, military, communications, aerospace, business, scientific, and general computing applications. Set operational specifications and formulate and analyze software requirements. May design embedded systems software. Apply principles and techniques of computer science, engineering, and mathematical analysis.



Sample job titles: Developer, Infrastructure Engineer, Network Engineer, Publishing Systems Analyst, Senior Software Engineer, Software Architect, Software Developer, Software Engineer, Systems Coordinator, Systems Engineer

Web Developers (15-1134)

Design, create, and modify Web sites. Analyze user needs to implement Web site content, graphics, performance, and capacity. May integrate Web sites with other computer applications. May convert written, graphic, audio, and video components to compatible Web formats by using software designed to facilitate the creation of Web and multimedia content.

Sample job titles: Web Designer, Web Developer, Webmaster

Job Opportunities

In the Riverside-San Bernardino-Ontario MSA, the computer programming occupation group is expected to increase employment 10% between 2015 and 2020. Nearly 1,100 computer programming job opportunities will be available over the five-year projection period due to new job growth and replacement need (e.g. retirements); more than 210 computer programming jobs openings each year during the five-year time frame. As shown in the table below, software developers, applications is the occupation with the most annual job openings. Web developers will be the fastest growing occupation, increasing employment by 15%

Exhibit 1: 5-year projections for the computer programming occupation group in the Riverside-San Bernardino-Ontario MSA

Occupations	2015 Jobs	2020 Jobs	5-Yr Change	5-Yr % Change	5-Yr Openings (New + Replacemet Jobs)	Annual Openings
Software Developers, Applications (15-1132)	2,874	3,147	273	9%	492	98
Web Developers (15-1134)	1,046	1,198	152	15%	226	45
Computer Programmers (15-1131)	951	972	21	2%	146	29
Software Developers, Systems Software (15-1133)	890	1,011	121	14%	190	38
Total	5,760	6,327	567	10%	1,054	211

Source: EMSI Class of Worker 2017.1

Earnings

In the Riverside-San Bernardino-Ontario MSA, the entry wage for the computer programming occupation group is \$26.73 per hour, above the MIT Living Wage estimate of \$11.75 per hour for a single adult living in the Riverside-San Bernardino-Ontario MSA. The combined average annual earnings for these occupations are \$85,779 per year, assuming full-time employment.

Exhibit 2: Earnings for the computer programming occupation group in the Riverside-San Bernardino-Ontario MSA

Occupations (SOC)	Entry Hourly Earnings	Median Hourly Earnings	Experienced Hourly Earnings	Avg. Annual Earnings
Software Developers, Applications (15-1132)	\$31.37	\$45.41	\$64.93	\$97,011
Software Developers, Systems Software (15-1133)	\$31.18	\$48.18	\$67.25	\$99,632
Computer Programmers (15-1131)	\$22.04	\$33.37	\$49.10	\$72,301
Web Developers (15-1134)	\$14.43	\$24.66	\$43.41	\$55,370
Average Wages	\$26.73	\$40.08	\$58.77	\$85,779

Source: EMSI Class of Worker 2017.1 Entry Hourly is 10th percentile wage, median is 50th percentile wage, experienced is 90th percentile wage.

Job Advertisements, Top Employers, Skills, and Education

Across the full-year 2016, there were a total of 2,071 job advertisements (ads) for the computer programming occupation group in the Riverside-San Bernardino-Ontario MSA. Nearly 60% of these listings in the region were for software developers, applications (1,226 postings).

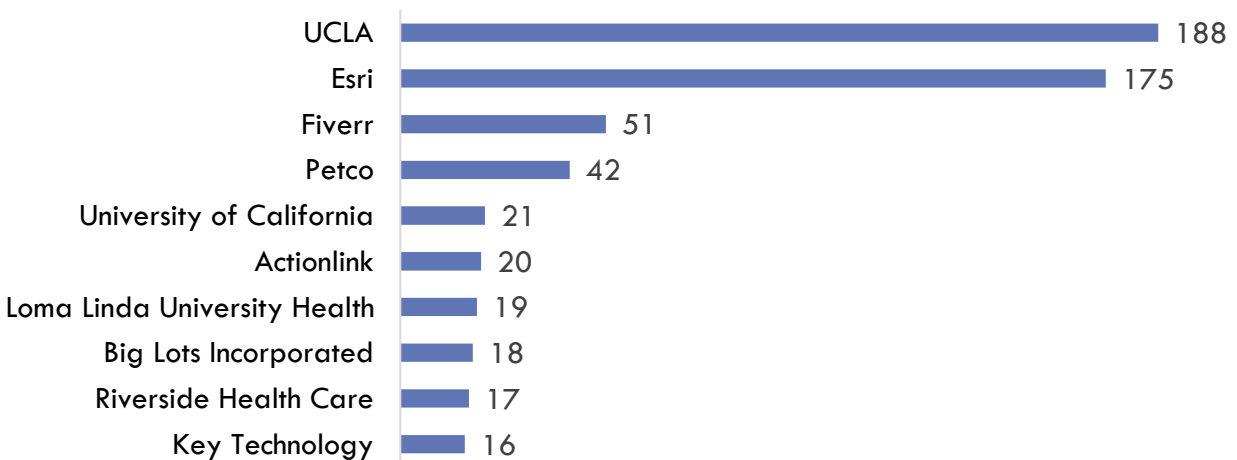
Exhibit 3: Job ads for the computer programmer occupation group (n=2,071)

Occupations	Job Ads, Full-Year 2016
Software Developers, Applications (15-1132)	1,226
Web Developers (15-1134)	523
Computer Programmers (15-1131)	306
Software Developers, Systems Software (15-1133)	16

Source: Burning Glass

Exhibit 4 lists the top employers hiring employees for the computer programming occupations. Top employers included: UCLA, Esri, Fiverr, Petco, and University of California. Only 58% of job postings included the name of the employer. The top ten worksite cities in the two-county region for the computer programming occupation group were Ontario, Redlands, Riverside, Temecula, and San Bernardino.

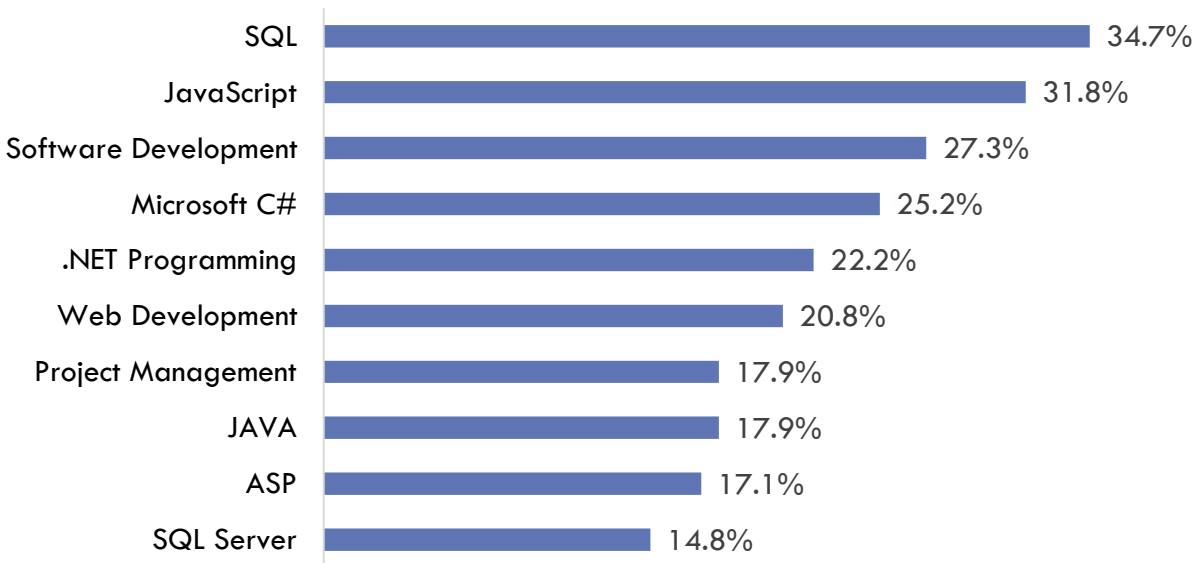
Exhibit 4: 2016 top employers for the computer programming occupation group in the Riverside-San Bernardino-Ontario MSA (n=1,203)



Source: Burning Glass

Exhibit 5 lists the top 10 skills mentioned in job ads for computer programming. Top skills included: SQL, JavaScript, and Software Development.

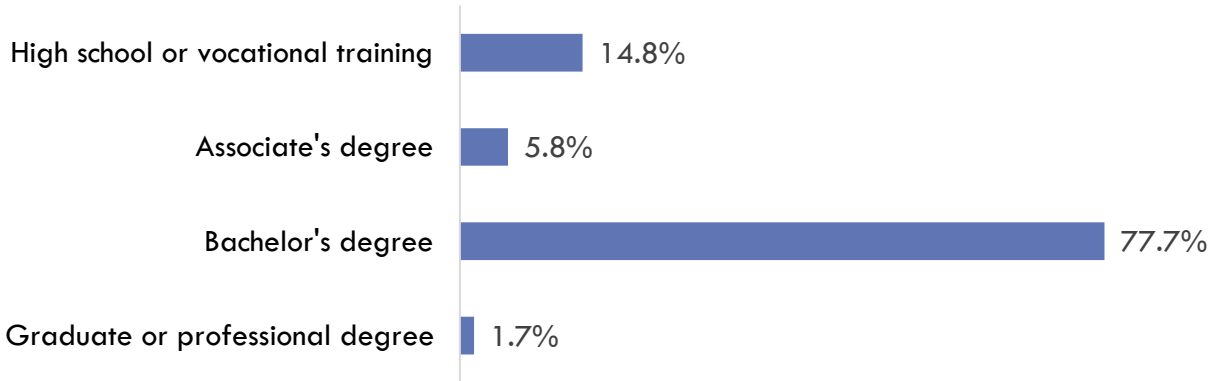
Exhibit 5: 2016 top skills for the computer programming occupation group in the Riverside-San Bernardino-Ontario MSA (n=1,835)



Source: Burning Glass

Exhibit 6 displays the education requirement to employers requested in online job ads for the computer programming occupation group. The majority of employers were looking for a candidate with a bachelor's degree in 2016. According to the Bureau of Labor Statistics, nearly all the occupations listed typically require the combination of a bachelor's degree and no on-the-job training. Only web developers require an Associate's degree.

Exhibit 6: 2016 online job ads minimum advertised education requirements for the computer programming occupation group in the Riverside-San Bernardino-Ontario MSA (n=1,112)



Source: Burning Glass

Student Completions

Exhibit 7 shows the projected 2015 to 2020 annual job openings for the occupations in Exhibit 1 with the associated TOP6 program. Exhibit 7 also shows the annual average regional community college awards (Associate's degree, certificates, or other awards) and the total annual average awards for education institutions outside the California Community Colleges system for the three academic years from 2012 to 2015. Please note, an award is not equivalent to a single person in search of a job opening since students may earn more than one award, such as a degree in addition to a certificate. Exhibit 8 displays a training gap of 163 jobs for occupations in cluster in the two-county region.

Exhibit 7: Annual job openings and student completions for the computer programming occupation group program in Riverside-San Bernardino-Ontario MSA

TOP6	TOP6 Title	Annual Job Openings	Annual Avg. Associate Degrees (2012-15)	Annual Avg. Certificates or Other Credit Awards (2012-15)	Total Other Edu. Institutions Annual Avg. Awards (2012-15)
070710	Computer Programming	211	16	32	-
Total			48		

Exhibit 8: Training gap for the computer programming occupation group in the Riverside-San Bernardino-Ontario MSA



Michael Goss, Director

Center of Excellence, Inland Empire/ Desert Region

michael.goss@chaffey.edu

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