

RESEARCH BRIEF
**Employment Outcomes of NOVA Graduates:
 Computer Science, A.S. Program**
Introduction

This Research Brief presents the employment outcomes of 340 NOVA graduates of the Computer Science, A.S. program from 2007 through 2017 (Section I) and provides employment data for Computer Science (A.S. and B.S.) graduates (Section II).¹ The employment data includes target occupations, job postings, companies hiring, and highly desired job skills and qualifications for Computer Science (A.S. and B.S.) graduates in the NOVA region during the specified period.²

Data were extracted utilizing the Economic Modeling Specialists International (EMSI) product, which provides employment data derived from government sources, online job posting activity, and professional networking profiles (e.g., LinkedIn) and résumés. EMSI employment data were also used to determine the employment outcomes and workforce credentials of NOVA graduates.³

Key Findings

- Seventy-seven percent of NOVA's Computer Science, A.S. program graduates are employed in their field.
- The employment opportunities for Computer Science (A.S. and B.S.) graduates in the NOVA region are favorable for target occupations including Software Developers of Applications, Software Developers of Systems Software, Computer User Support Specialists, and Computer and Information Systems Managers.
 - Regionally, these target occupations have expected job growth, and median hourly earnings higher than national median hourly earnings for these occupations.
- Booz Allen Hamilton Holding, Leidos Holdings, General Dynamics, Oracle, and Science Applications International are the top five companies hiring Computer Science (A.S. and B.S.) graduates in the NOVA region.

¹ Graduates may have earned additional degrees beyond the Computer Science (A.S.).

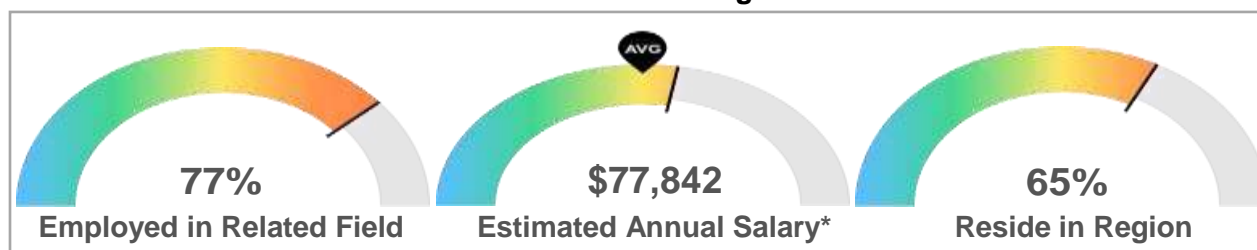
² Job postings comprise both full-time and part-time positions.

³ EMSI: <https://www.economicmodeling.com/>

Section I. Employment Outcomes of NOVA Graduates

This section provides recent (2019) employment outcomes information for 340 NOVA graduates of the Computer Science, A.S. program who graduated from 2007 through 2017.⁴ Of these graduates, the majority (77 percent) were employed in a computer science-related occupation and 65 percent resided within the NOVA region.⁵ The average estimated annual salary among these graduates was \$77,842—17 percent higher than the average estimated annual salary among *all* NOVA graduates from 2007 through 2017 (Figure 1).

**Figure 1. Employment Outcomes of NOVA Computer Science (A.S.)
Graduates: 2007 through 2017**



* The average estimated annual salary among all NOVA 2007 through 2017 graduates was \$66,652.

Alumni Occupations

The top occupations of NOVA's Computer Science, A.S. program graduates were Software Developers of Applications (12 percent), Web Developers (8 percent), and Computer User Support Specialists (7 percent) (Table 1).

**Table 1. Occupations among NOVA Computer Science (A.S.)
Graduates: 2007 through 2017**

Occupations	SOC Code**	Graduates	
		#	%
Software Developers of Applications	15-1132	41	12.1
Web Developers	15-1134	27	7.9
Computer User Support Specialists	15-1151	22	6.5
Computer Occupations (non-specific)	15-1199	15	4.4
Network and Computer Systems Administrators	15-1142	15	4.4
Retail Salespersons*	41-2031	14	4.1
Cashiers*	41-2011	8	2.4
Customer Service Representatives	43-4051	8	2.4
Software Developers of Systems Software	15-1133	8	2.4
Computer Programmers	15-1131	7	2.1
Postsecondary Teachers	25-1099	6	1.8
Secretaries and Administrative Assistants (excluding Legal, Medical, and Exec.)	43-6014	6	1.8
Teachers and Instructors (non-specific)	25-3099	6	1.8
<i>Unclassified Occupation*</i>	99-9999	17	5.0

*Occupations classified as out-of-field and not related to the program of study.

**Standard Occupational Classification (SOC) is a U.S. Bureau of Labor Statistics occupational coding standard (<https://www.bls.gov/soc/>)

Note: Occupations with percentages less than 1.5% are not included in the table.

⁴ Graduates may have earned additional degrees beyond the Computer Science (A.S.).

⁵ The NOVA region refers to Arlington County, Fairfax County, Loudoun County, Prince William County, Alexandria City, Fairfax City, Falls Church City, Manassas City, Manassas Park City, and Washington, D.C.

Employers and Job Titles of Alumni

The top employers of NOVA's Computer Science, A.S. program graduates included Best Buy Co. (2 percent), Accenture (2 percent), George Mason University (2 percent), Northern Virginia Community College (1 percent), and Amazon.com (1 percent) (Table 2).

**Table 2. Top 20 Employers of NOVA Computer Science (A.S.)
Graduates: 2007 through 2017**

Employers	Graduates	
	#	%
Best Buy Co., Inc.	6	1.8
Accenture, Inc.	5	1.5
George Mason University	5	1.5
Amazon.com, Inc.	4	1.2
Northern Virginia Community College	4	1.2
Caci International, Inc.	3	0.9
Fairfax County Public Schools	3	0.9
Micro Electronics, Inc.	3	0.9
Wal-Mart Stores, Inc.	3	0.9
Booz Allen Hamilton Holding Corporation	2	0.6
Capital One Financial Corporation	2	0.6
Graham Holdings Company	2	0.6
Hhgregg, Inc.	2	0.6
Northrop Grumman Corporation	2	0.6
PNC	2	0.6
The Home Depot, Inc.	2	0.6
University of Maryland	2	0.6
Webb Signs Incorporated	2	0.6
Wegmans Food Markets, Inc.	2	0.6
Rice University	1	0.3

The most popular job titles among NOVA's Computer Science, A.S. program graduates were Software Engineer (8 percent), Web Developer (4 percent), Retail Sales Associate (3 percent), and Systems Engineer (2 percent) (Table 3).

**Table 3. Top Job Titles of NOVA Computer Science (A.S.)
Graduates: 2007 through 2017**

Job Titles	Graduates	
	#	%
Software Engineer	27	7.9
Web Developer	14	4.1
Retail Sales Associate	11	3.2
Systems Engineer	8	2.4
Customer Service Representative	6	1.8
Software Developer	6	1.8
Cashier	4	1.2
IT Help Desk Specialist	4	1.2
Java Developer	4	1.2
Mobile Software Engineer	4	1.2
Systems Administrator	4	1.2
Tutor	4	1.2
Undergraduate Assistant	4	1.2

Note: Job titles with percentages less than 1.0% are not included in the table.

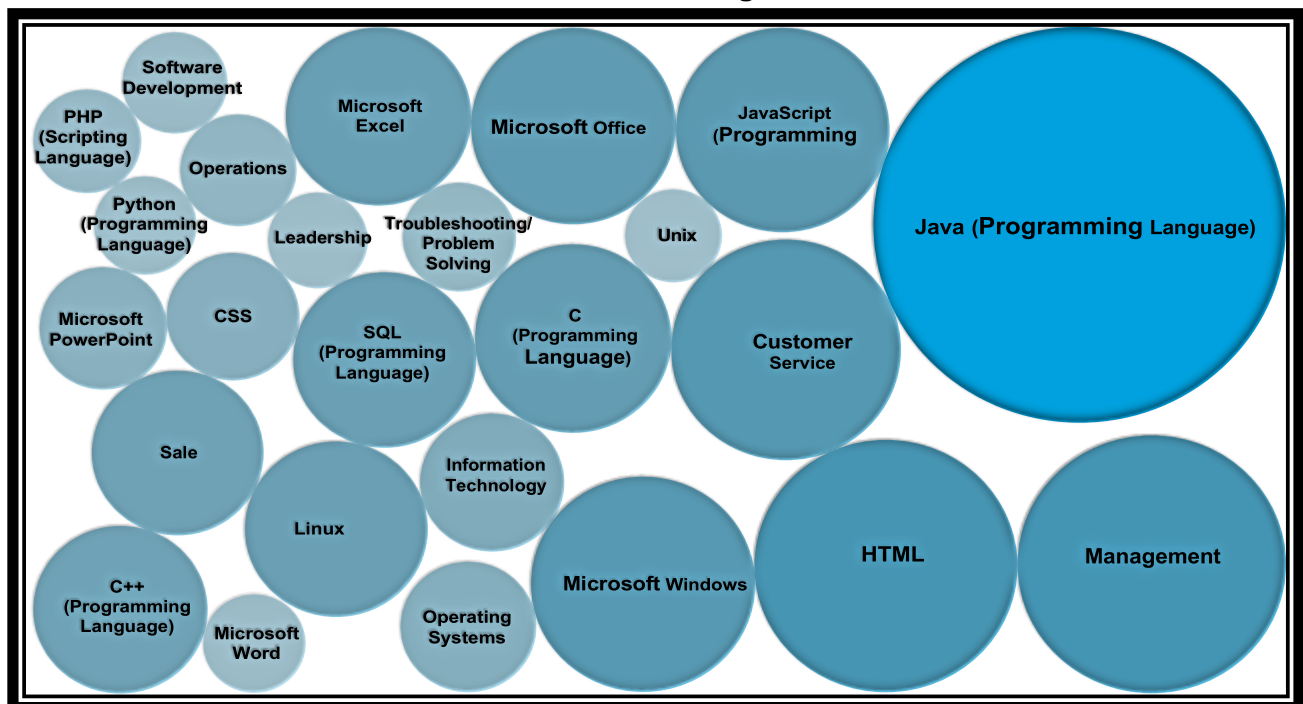
Alumni Skills

The top hard and common skills of NOVA’s Computer Science, A.S. program graduates included Java programming language (44 percent), management (29 percent), HTML (28 percent), customer service (25 percent), and Microsoft Windows (24 percent) (Table 4 and Figure 2, below).⁶

Table 4. Top 10 Hard and Common Skills of NOVA Computer Science (A.S.) Graduates: 2007 through 2017

Hard and Common Skills	Graduates	
	#	%
Java (Programming Language)	150	44.1
Management	98	28.8
HTML	96	28.2
Customer Service	84	24.7
Microsoft Windows	82	24.1
JavaScript (Programming Language)	78	22.9
Microsoft Office	75	22.1
C (Programming Language)	72	21.2
Microsoft Excel	68	20.0
Linux	67	19.7

Figure 2. Hard and Common Skills of NOVA Computer Science (A.S.) Graduates: 2007 through 2017



⁶ Hard skills are defined as technical or specialized skills often acquired through formal education, while common skills refer to soft and transferable skills broadly utilized in various professions.

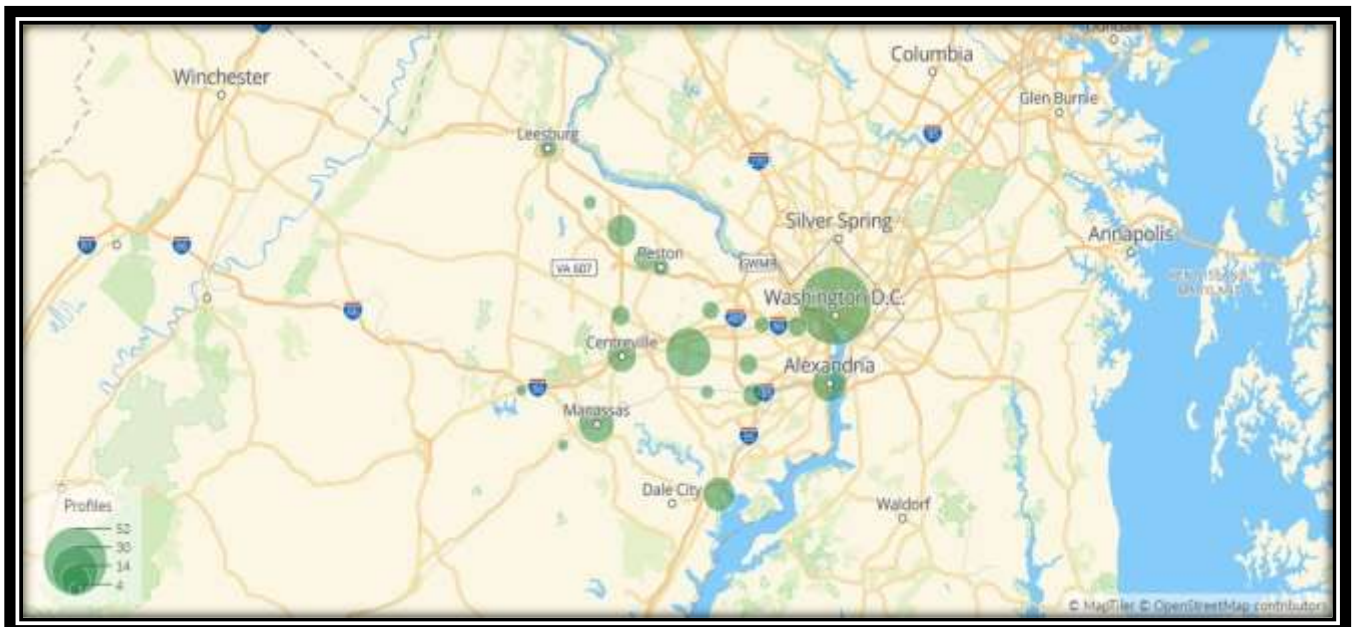
Alumni Locations

The top locations where NOVA’s Computer Science, A.S. program graduates resided included Washington, D.C. (20 percent), Fairfax, VA (9 percent), Manassas, VA (6 percent), Alexandria, VA (6 percent), and Woodbridge, VA (5 percent). Overall, seventy percent resided in the state of Virginia (Table 5 and Figure 3, below).

Table 5. Top 20 Locations of NOVA Computer Science (A.S.) Graduates: 2007 through 2017

Locations	Graduates	
	#	%
Washington, D.C.	67	19.7
Fairfax, VA	30	8.8
Manassas, VA	20	5.9
Alexandria, VA	19	5.6
Woodbridge, VA	17	5.0
Centreville, VA	15	4.4
Sterling, VA	15	4.4
Herndon, VA	10	2.9
Springfield, VA	9	2.7
Annandale, VA	8	2.4
Arlington, VA	8	2.4
Chantilly, VA	8	2.4
Leesburg, VA	8	2.4
Reston, VA	7	2.1
Vienna, VA	7	2.1
Falls Church, VA	6	1.8
Ashburn, VA	5	1.5
Burke, VA	5	1.5
Bristow, VA	4	1.2
Gainesville, VA	4	1.2

Figure 3. Locations of NOVA Computer Science (A.S.) Graduates: 2007 through 2017



Section II. Regional Employment Opportunities for NOVA Graduates

This section presents regional employment opportunities data and provides job postings for target occupations within the NOVA region for Computer Science (A.S. and B.S.) graduates.⁷

Target Occupations

In 2018, regionally, there were about 78,000 jobs and 6,000 job openings in the top 10 target occupations for Computer Science (A.S. and B.S.) graduates.⁸ Among these target occupations, median hourly earnings were \$54.96—28 percent higher than the \$42.98 national median hourly earnings for these target occupations. The projected job growth among these target occupations is 6 percent from 2018 to 2023—4 percentage points fewer than the projected national growth for these target occupations (10 percent). Annual job openings for target occupations for Computer Science (A.S. and B.S.) graduates were greatest for Software Developers of Applications (1,523 openings) and Computer Occupations/non-specific (1,100 openings) (Table 6).

Table 6. NOVA Region Job Openings, Earnings, and Growth of Top 10 Target Occupations: 2018

Target Occupations	# of Jobs	# of Job Openings	Median Hourly Earnings	% Job Growth (2018 – 2023)	Location Quotient*
Software Developers of Applications	15,455	1,523	\$56.09	15.4%	1.9
Computer Occupations (non-specific)	15,731	1,100	\$56.12	1.4%	4.3
Software Developers of Systems Software	12,603	893	\$58.56	2.8%	3.4
Computer User Support Specialists	7,978	708	\$30.63	6.8%	1.3
Computer and Information Systems Managers	7,091	600	\$82.50	5.1%	2.0
Information Security Analysts	6,488	594	\$55.51	11.0%	6.6
Computer Network Architects	3,843	262	\$62.76	0.8%	2.8
Computer Programmers	3,410	226	\$47.21	-1.1%	1.4
Web Developers	2,508	228	\$42.82	9.3%	1.4
Computer Network Support Specialists	2,282	184	\$37.85	3.1%	1.3

*Location Quotient = the ratio of an occupation's share of employment in a given area to that occupation's share of employment in the U.S. as a whole. For example, an occupation that makes up 10 percent of employment in a specific metropolitan area compared with 2 percent of U.S. employment would have a location quotient of 5 for the area (signifying the occupation is roughly 5 times more concentrated regionally than nationally).

From January 2018 through December 2018, on average, there were about 5,100 Computer Science graduates hired monthly for target occupations in the NOVA region.⁹ The top average monthly job hires were for Software Developers of Applications (1,052 hires) and Software Developers of Systems Software (854 hires) (Table 7 and Figure 4, next page).

Table 7. NOVA Region Job Hires in Top 10 Target Occupations: 2018

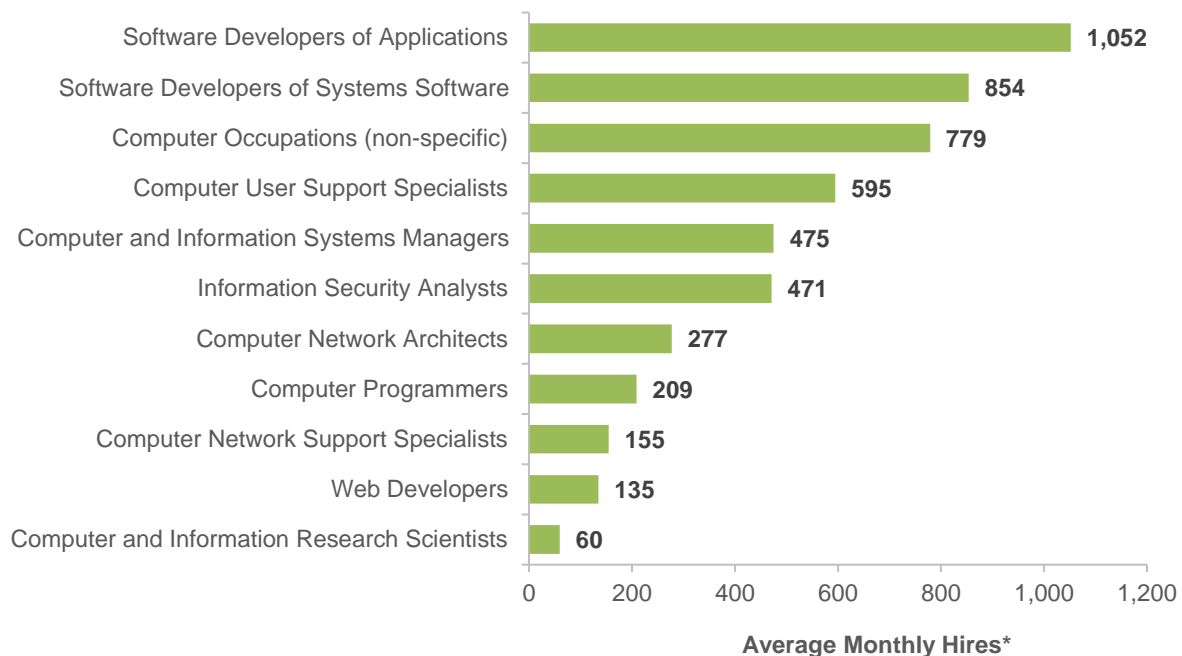
Target Occupations	Avg. Monthly Hires*	Target Occupations	Avg. Monthly Hires*
Software Developers of Applications	1,052	Information Security Analysts	471
Software Developers of Systems Software	854	Computer Network Architects	277
Computer Occupations (non-specific)	779	Computer Programmers	209
Computer User Support Specialists	595	Computer Network Support Specialists	155
Computer and Information Systems Managers	475	Web Developers	135

* Average monthly hires include Computer Science graduates with an A.S., B.S., or post-baccalaureate degree.

⁷ The NOVA region refers to Arlington County, Fairfax County, Loudoun County, Prince William County, Alexandria City, Fairfax City, Falls Church City, Manassas City, Manassas Park City, and Washington, D.C.

⁸ The Computer Science A.S. and B.S. were the minimum degree qualifications in these job postings.

⁹ Includes Computer Science graduates with an A.S., B.S., or post-baccalaureate degree

Figure 4. NOVA Region Top Job Hires in Target Occupations: 2018

* Average monthly hires include Computer Science graduates with an A.S., B.S., or post-baccalaureate degree

From January 2018 through December 2018, the top job postings website sources for target occupations for Computer Science (A.S. and B.S.) graduates in the NOVA region were Nexxt.com (46,292 postings), My.jobs (25,832 postings), and Dice.com (24,602 postings) (Table 8).

Table 8. Top 20 Job Posting Sources for Target Occupations in NOVA Region: 2018

Website	# of Target Job Postings on Website
Nexxt.com	46,292
My.jobs	25,832
Dice.com	24,602
Employmentcrossing.com	22,544
Jobserve.com	22,235
Clearancejobs.com	20,861
Virginiajobnetwork.com	19,573
Geebo.com	17,432
Careerboard.com	16,695
Bluecollarcrossing.com	12,644
Careerbuilder.com	11,676
Jobs.net	10,852
Monster.com	10,695
Beyond.com	10,147
Jobing.com	9,057
Resume-library.com	8,522
Washingtonpost.com	8,135
Recruitenetworks.com	8,121
Americasjobexchange.com	6,664
Glassdoor.com	5,837

Job Postings in NOVA Region

Companies in the NOVA region with the most job postings from January 2018 through December 2018 for Computer Science (A.S. and B.S.) graduates included Booz Allen Hamilton Holding Corporation (8,537 postings), Leidos Holdings (6,300 postings), and General Dynamics Corporation (4,816 postings) (Table 9 and Figure 5, below).

Table 9. Top 20 Companies Posting Jobs in the NOVA Region: 2018

Company Name	# of Unique Job Postings	Median Duration of Job Posting (# of days)
Booz Allen Hamilton Holding Corporation	8,537	46
Leidos Holdings, Inc.	6,300	22
General Dynamics Corporation	4,816	48
Oracle Corporation	3,603	65
Science Applications International Corporation	3,324	41
Mantech International Corporation	3,097	30
Caci International, Inc.	2,674	70
Deloitte LLP	2,277	51
Capital One Financial Corporation	2,118	46
Anthem, Inc.	1,866	23
BAE SYSTEMS PLC	1,552	52
Engility Holdings, Inc.	1,453	51
Perspecta, Inc.	1,308	9
Raytheon Company	1,297	62
Northrop Grumman Corporation	1,293	51
Vencore, Inc.	1,287	59
Amazon.com, Inc.	1,087	69
Unisys Corporation	1,036	45
Accenture, Inc.	1,004	53
Capital Markets Placement, Inc.	897	6

Figure 5. Top 20 Companies Posting Jobs in the NOVA Region: 2018



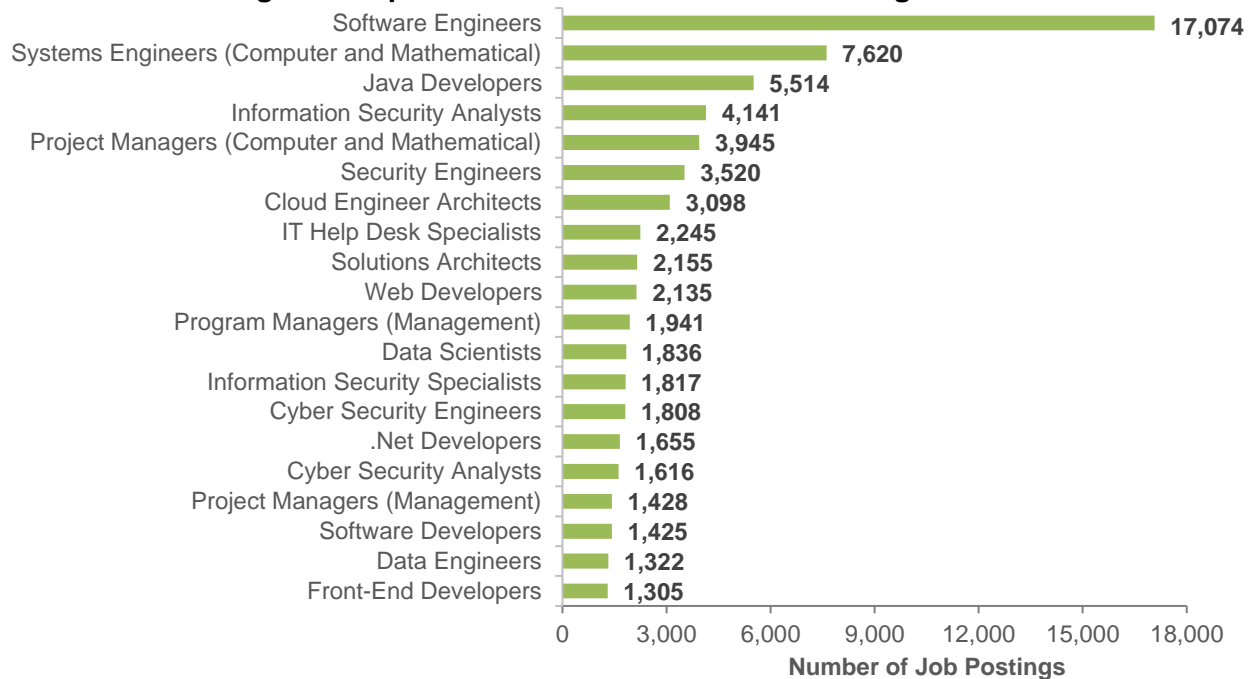
Job Titles in NOVA Region

From January 2018 through December 2018, the most frequently posted job titles for Computer Science (A.S. and B.S.) graduates in the NOVA region were for Software Engineers (17,074 postings), Systems Engineers/Computer and Mathematical (7,620 postings), and Java Developers (5,514 postings) (Table 10 and Figure 6, below).

Table 10. Top 20 Posted Job Titles in the NOVA Region: 2018

Job Title	# of Unique Job Postings	Median Duration of Job Posting (# of days)
Software Engineers	17,074	38
Systems Engineers (Computer and Mathematical)	7,620	43
Java Developers	5,514	36
Information Security Analysts	4,141	45
Project Managers (Computer and Mathematical)	3,945	38
Security Engineers	3,520	41
Cloud Engineer Architects	3,098	42
IT Help Desk Specialists	2,245	36
Solutions Architects	2,155	48
Web Developers	2,135	40
Program Managers (Management)	1,941	44
Data Scientists	1,836	40
Information Security Specialists	1,817	48
Cyber Security Engineers	1,808	42
.Net Developers	1,655	38
Cyber Security Analysts	1,616	46
Project Managers (Management)	1,428	40
Software Developers	1,425	47
Data Engineers	1,322	29
Front-End Developers	1,305	38

Figure 6. Top 20 Posted Job Titles in the NOVA Region: 2018



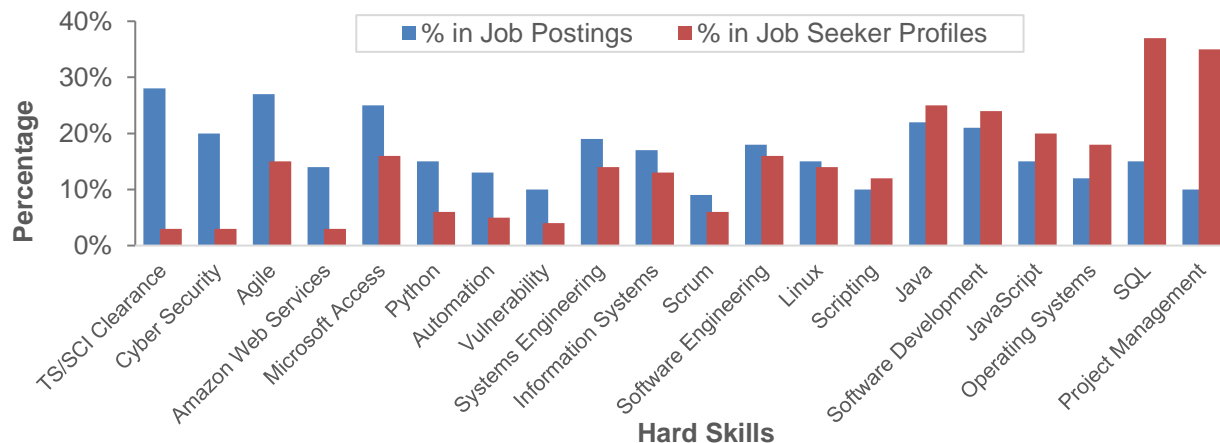
Desired Hard Skills

Table 11 and Figure 7 (below) show disproportions between the top *hard* skills that NOVA region employers sought among their job applicants and the hard skills that Computer Science (A.S. and B.S.) graduates mentioned in their job-seeker profiles from January 2018 through December 2018.¹⁰ Cyber Security, Agile Software Development, and Amazon Web Services were among the most desired hard skills in job postings that were disproportionately mentioned in job-seeker profiles. These differences represent potential areas in which job applicants could align their hard skills more closely with their prospective employers' desired skills.

Table 11. Top 20 Desired Hard Skills for Computer Science Graduates: 2018

Hard Skills	% of Job Postings Mentioning Skill	% of Job Seeker Profiles Mentioning Skill	Difference in Percentage
Top Secret-Sensitive Compartmented Info. (TS/SCI Clearance)	28	3	-25
Cyber Security	20	3	-17
Agile Software Development	27	15	-12
Amazon Web Services	14	3	-11
Microsoft Access	25	16	-9
Python (Programming Language)	15	6	-9
Automation	13	5	-8
Vulnerability	10	4	-6
Systems Engineering	19	14	-5
Information Systems	17	13	-4
Scrum (Software Development)	9	6	-3
Software Engineering	18	16	-2
Linux	15	14	-1
Scripting	10	12	2
Java (Programming Language)	22	25	3
Software Development	21	24	3
JavaScript (Programming Language)	15	20	5
Operating Systems	12	18	6
SQL (Programming Language)	15	37	22
Project Management	10	35	25

Figure 7. Top 20 Desired Hard Skills for Computer Science Graduates: Percentage Mentioned in Job Postings and Job Seeker Profiles in 2018



¹⁰ Hard skills are defined as technical or specialized skills often acquired through formal education.

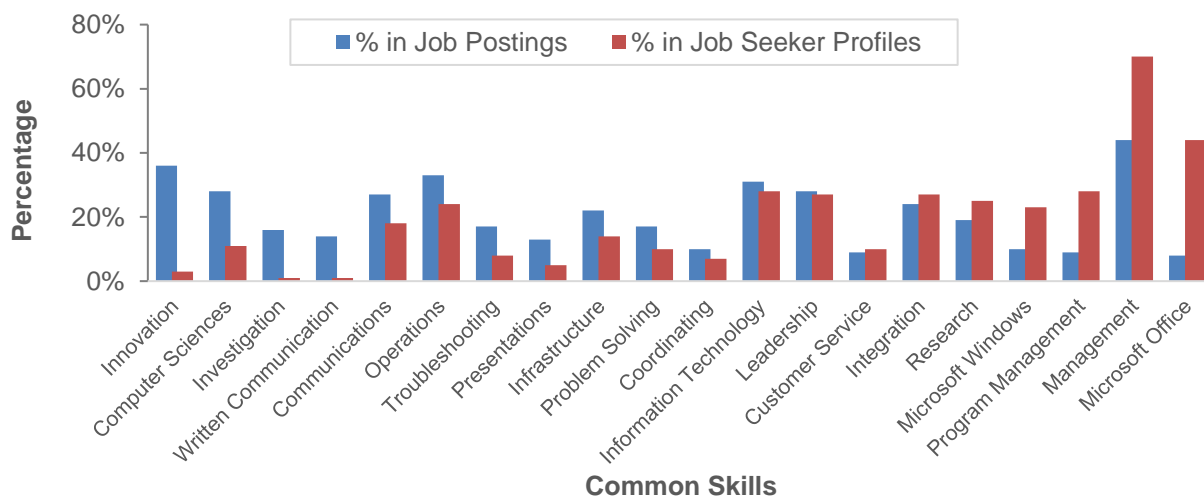
Desired Common Skills

Table 12 and Figure 8 (below) show disproportions between the top *common* skills that NOVA region employers sought among their job applicants and the common skills that Computer Science (A.S. and B.S.) graduates mentioned in their job-seeker profiles from January 2018 through December 2018.¹¹ Innovation, computer sciences, and investigation were among the most desired common skills in job postings that were disproportionately mentioned in job-seeker profiles. These differences represent potential areas in which job applicants could align their common skills more closely with their prospective employers' desired skills.

Table 12. Top 20 Desired Common Skills for Computer Science Graduates: 2018

Common Skills	% of Job Postings Mentioning Skill	% of Job Seeker Profiles Mentioning Skill	Difference in Percentage
Innovation	36	3	-33
Computer Sciences	28	11	-17
Investigation	16	1	-15
Written Communication	14	1	-13
Communications	27	18	-9
Operations	33	24	-9
Troubleshooting (Problem Solving)	17	8	-9
Presentations	13	5	-8
Infrastructure	22	14	-8
Problem Solving	17	10	-7
Coordinating	10	7	-3
Information Technology	31	28	-3
Leadership	28	27	-1
Customer Service	9	10	1
Integration	24	27	3
Research	19	25	6
Microsoft Windows	10	23	13
Program Management	9	28	19
Management	44	70	26
Microsoft Office	8	44	36

Figure 8. Top 20 Desired Common Skills for Computer Science Graduates: Percentage Mentioned in Job Postings and Job Seeker Profiles in 2018



¹¹ Common skills refer to soft and transferable skills broadly utilized in various professions.

Desired Qualifications

The top desired qualifications for Computer Science (A.S. and B.S.) graduates in NOVA region job postings from January 2018 through December 2018 included Certified Information Systems Security Professional (14,324 postings), CompTIA Security+ (8,362 postings), and Project Management Professional Certification (7,018 postings) (Table 13 and Figure 9, below).

Table 13. Top 20 Desired Qualifications Posted for Computer Science Graduates: 2018

Job Qualifications	# of Job Postings
Certified Information Systems Security Professional	14,324
CompTIA Security+	8,362
Project Management Professional Certification	7,018
GIAC Certifications	6,501
IAT Level II Certification	3,930
Certified Ethical Hacker	3,907
Certified Information Security Manager	3,882
ITIL Certifications	3,498
Certified Information System Auditor (CISA)	3,074
Microsoft Certified Systems Engineer	2,548
Cisco Certified Network Associate	2,369
DoD Information Assurance (IA) Certification	2,136
GIAC Certified Incident Handler	2,125
ITIL Foundation Certification	2,014
GIAC Security Essentials Certification	2,005
Systems Security Certified Practitioner	1,890
Master Of Business Administration (MBA)	1,838
Cisco Certified Network Professional	1,599
Microsoft Certified Professional	1,579
Certified Scrum Master	1,572

Figure 9. Top 20 Desired Qualifications Posted for Social Sciences Graduates: 2018

