

**Q14.** Which characteristics of a developer are associated with his/her likelihood of security defect introduction (e.g., inexperienced in software development, new hire, and prior history of secure coding mistakes)?

Theme	Code	Definition	Number of Response
<b>Limited experience with the project</b>	Inexperienced/ lack of expertise	Lack of coding experience in general/ Inexperienced in software development overall	76
	Newly hired	Newly hired in particular project	21
	Experienced with different programming language/style/ Inexperienced with a particular language	Lack of experience in using the programming language of current project or experienced with different language other than the current one	3
	Inexperienced with the project/ out-house project	Lack of experience with the project: developer is working on or experienced in contributing to projects from outsider company	6
	unfamiliar with project style guide	Developer whose code shows that he is unfamiliar with the project codebase	1

	never participated in code review	No experience/knowledge about code review	1
	New contributor/first time contributor	New contributor or first time contributor for the particular project (may have experience with other projects of same/different company)	3
	Having few contribution	Having limited contribution to the current project	1
	external contributor	Developers who are not a part of the company/project and mainly work at some other company/projects	5
	unfamiliar developer	Developer who is not familiar to the reviewer	6
	Irregular contributor	Developers who do not submit code in the current project in regular manner	3
	New to mailing list	Developer newly added to the project mailing list(can be newly hired)	1

<b>Personal characteristics</b>	rushed developer	Developer who submitted code within limited time or whose code seems hurried up	8
	Overconfidence	Developer who is known as over confident about his code/work	1
	Sloppy developer	Developer who seems casual or callous to work in a systematic way	5
	Lack of attention	Developers who tend to pay less attention to his code/commits	1
	People who do not follow up with feedback	Developer who does not give update after receiving feedback from the reviewer	1
	People who are more focused on completing tasks	Developers whose code seems they want to finish their work and submit it to the reviewer without much critical thinking	1
	lack of intellectual abilities	People who do not think critically of his work and do naive mistakes	3

	not following coding style guide	People not following coding guideline for the particular language they are using for the project	4
	indifferent to security	Developers who don't think about security while implementing any feature	7
<b>Prior coding history</b>	people who test security features inadequately	Developers who don't write enough test cases	5
	people who require frequent feedbacks	People who tend to be overly dependent on the reviewers' feedback	1
	overly focused on performance	Developers who tend to optimize the performance of the software most of the time	1
	history of code quality	Developers' previous history of contribution to the project	11
	ignoring bigger picture	People who do not think how largely his code may affect other parts of the project rather focus on only the module/feature he is working on	3

	bad code quality	Overall bad coding practice/ not following clean code practices	4
	History of mistakes	History of security defects/issues developed by the contributor	12
<b>Lack of security knowledge</b>	No prior contribution to security critical project	Inexperienced in coding in projects which are vulnerable to security threats	1
	Lack of experience in security	Limited/no prior experience of working in security related project/field	7
	too much dependency on security of features of programming language	People who do not put much security checks in code rather depends on security features of the language	1
	Not knowledgeable about computer science & security	Developer who has no/limited knowledge about theoretical computer science/security	1
	unfamiliar with specific security risk	Developer whose code seems he does not know about a particular security hole which may occur in current project	1

<b>Complexity of the task</b>	people who work on complex module	People working on any module having complex architecture or coding path	5
	People who write complex code	People who tend to code in a complicated way instead of writing clean code	5
	people who rewrite existing code	People who code already existing feature for any reason	1