WHAT ARE THE MAJOR TOPICS BEING DISCUSSED IN POPULER SOFTWARE TESTING BOOKS?
Mining Software Testing Knowledge

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Motivation and Background

What technical knowledge software engineers need to have about software testing and which information they actually acquire are critical concepts to study.

Test automation, test design and planning, performance testing, acceptance testing, execution monitoring are areas that are demanded by the software testing industry [2] [3] [4].

Rising trends include intelligence testing, web and mobile application testing, automated test generation [5] [6].

Research Questions

1- What are some software testing topics that are commonly discussed in the popular software testing books? Are there any patterns in terms of coverage of topics?

2- How do the topics covered in popular software testing books compare to the topics that are most relevant to the industry needs and rising software testing trends

3- Are there any major areas of software testing that are underrepresented in popular software books?

4- What are the most common testing tools and frameworks discussed in popular software testing books?

Methodology

Data Collection
Popular software testing book heuristics:
1- Amazon Best Sellers
2- University Curricula
3- ISTQB Syllabi

Topic Analysis
LDA Topic Modelling
- Chapter selection, Corpus pre-processing

Manual Inspection
- Chapter Labelling

Book Name	Author(s)	Edition	Publication Date	Selected Chapters
Foundations of Software Testing [9]	Graham et al.	4th	2019	All except 7
Lessons Learned in Software Testing [10]	Kaner et al.	1st	2001	All except 9, 10
The Art of Software Testing [11]	Mayers et al.	3rd	2011	All except 1
Agile Testing [12]	Crispin & Gregory.	1st	2008	All except 3, 4
Introduction to Software Testing [13]	Ammann & Offutt	2nd	2016	All
Software Testing: A Craftsman's Approach [14]	Jorgensen	4th	2013	All except 2
Systematic Software Testing [15]	Craig & Jaskiel	1st	2002	Except 8, 9, 10, 11, 12
The Pragmatic Programmer [16]	Thomas & Hunt	2nd	2020	13, 41, 42, 43
Clean Code [17]	Martin	1st	2008	9, 13, 15
Site Reliability Engineering [18]	Petoff et al.	1st	2016	see dataset
A Practitioner's Guide to Software Testing [19]	Copeland	1st	2004	All except 2
Software Testing and Analysis [20]	Pezze & Young	1st	2007	All
Software Testing [21]	Patton	2nd	2005	All except 22
Software Test Automation [22]	Graham	1st	1999	All

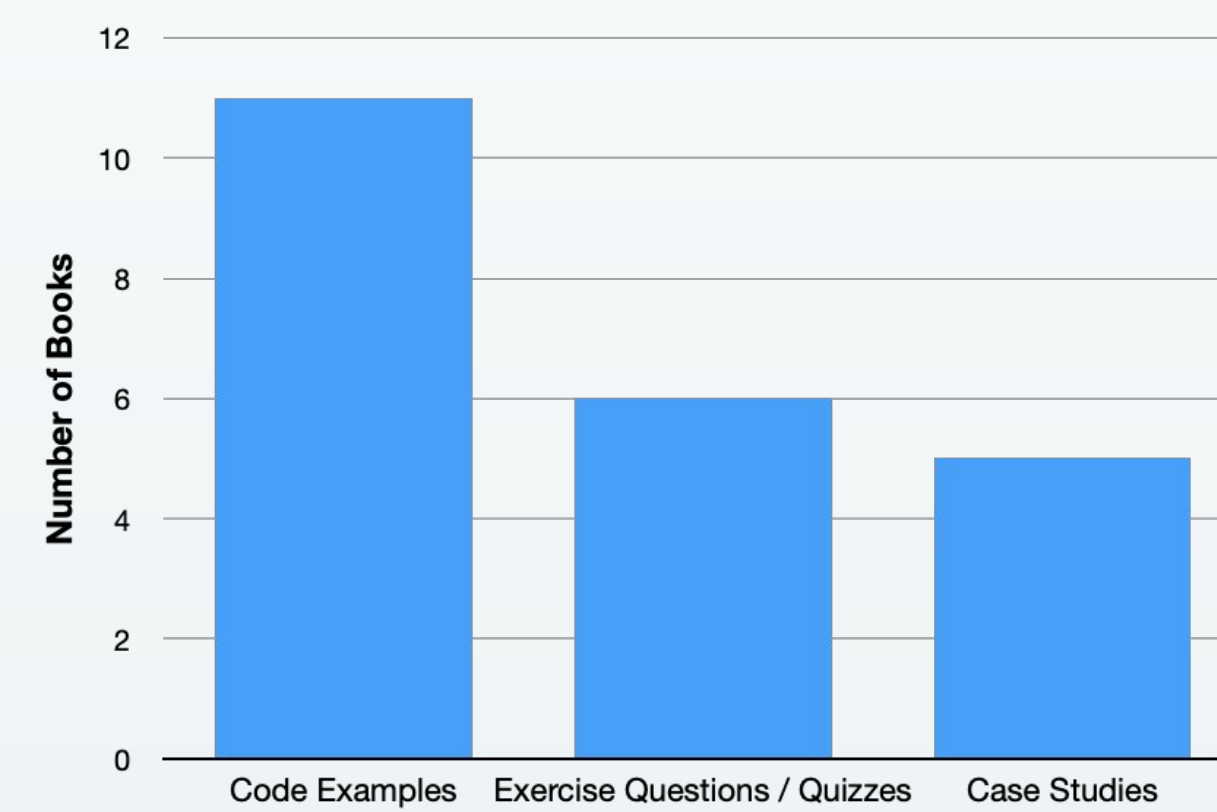Table 1: Collected Books

Results
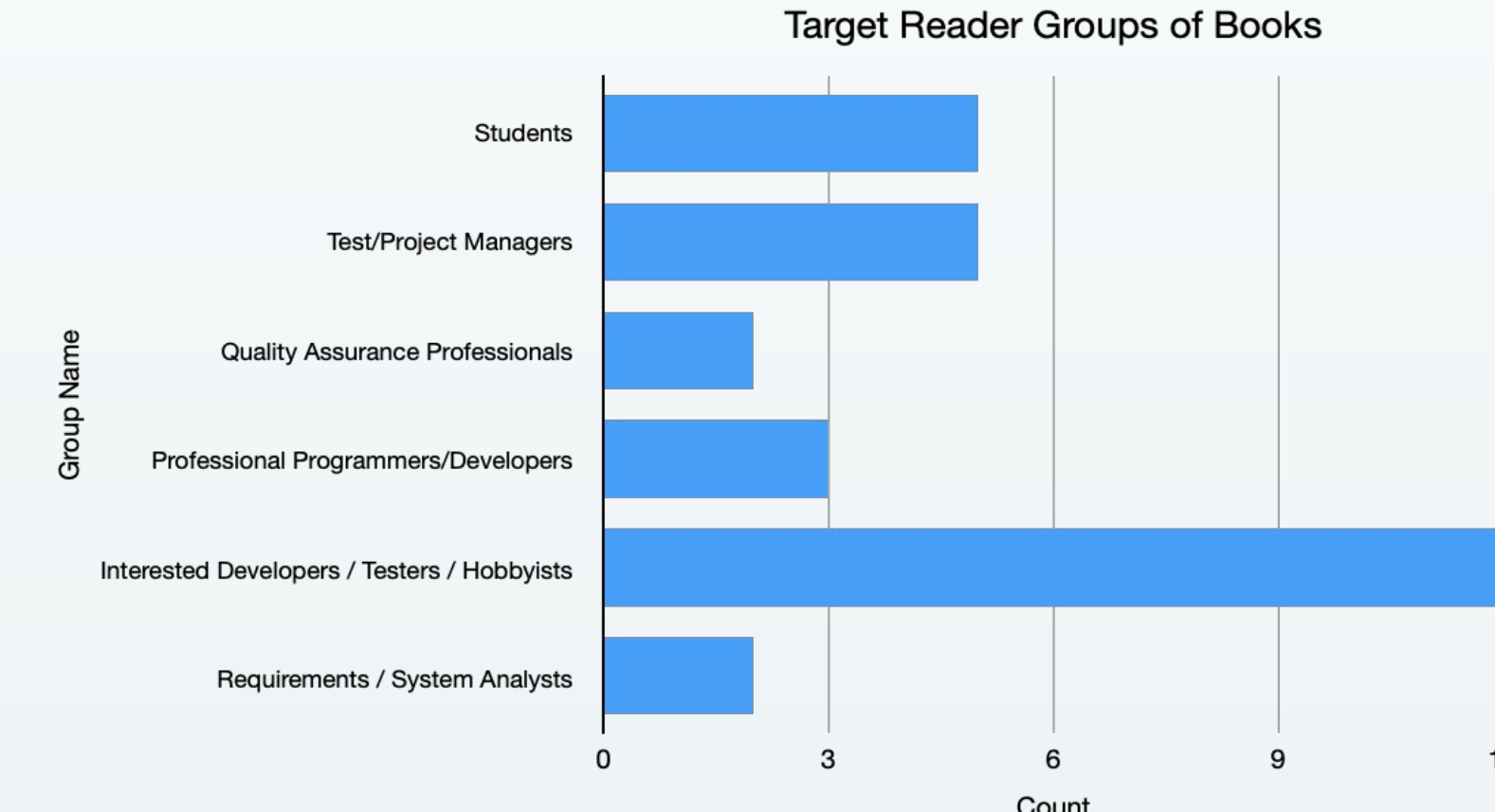

Figure 1: Content Delivery Types

Figure 2: Target Audience Groups

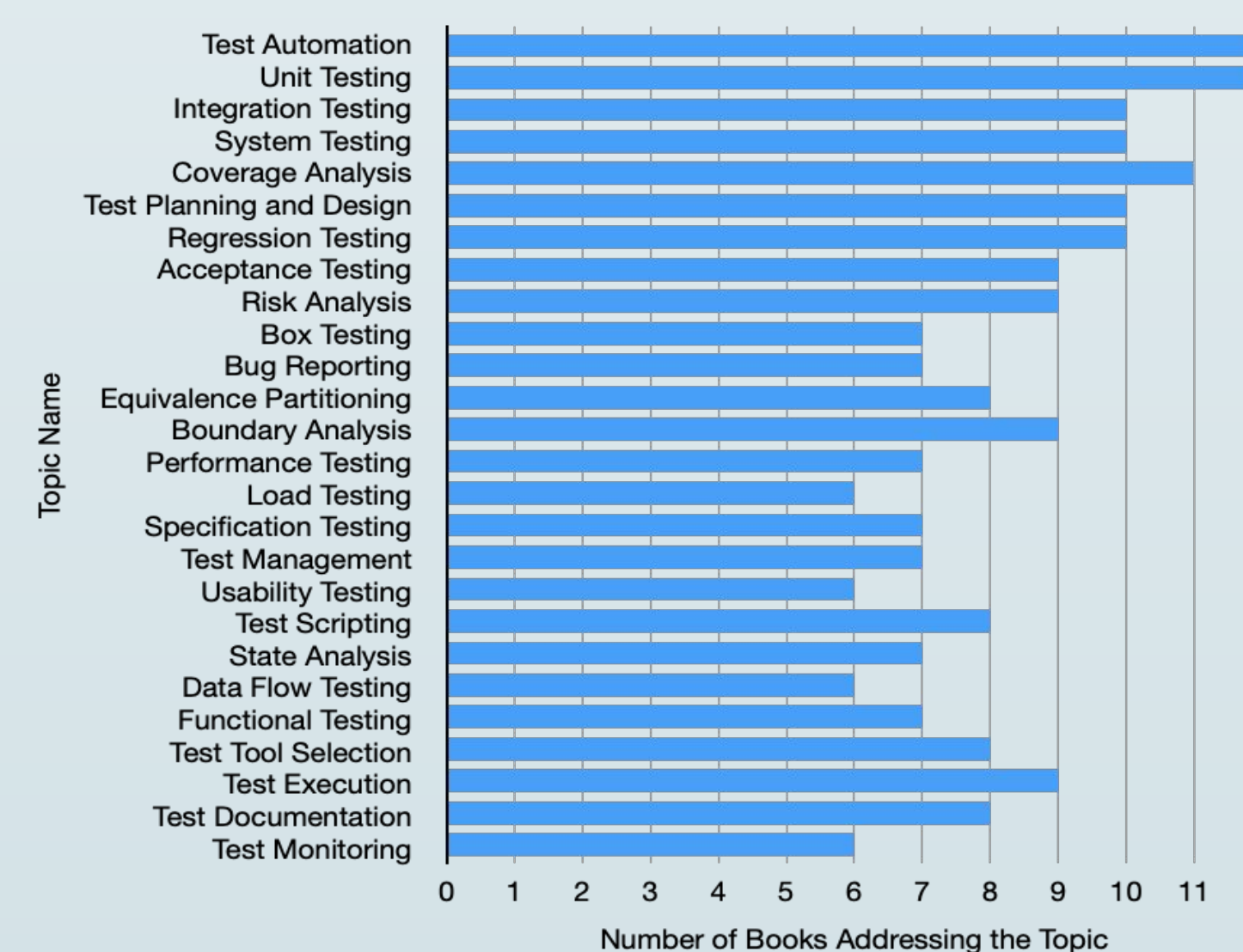| Topic Name	Keywords
1 - Test Automation and Tools	0.019*"tool" + 0.010*"automation" + 0.009*"data" + 0.007*"problem" + 0.007*"system" + 0.006*"automated" + 0.006*"bug" + 0.006*"application"
2 - Agile Testing	0.012*"story" + 0.009*"product" + 0.009*"development" + 0.008*"agile" + 0.006*"system" + 0.006*"business" + 0.006*"release" + 0.006*"project"
3 - Coverage Analysis	0.019*"path" + 0.014*"coverage" + 0.013*"node" + 0.013*"graph" + 0.012*"set" + 0.012*"variable" + 0.010*"input" + 0.009*"criterion"
4 - Service Load Testing	0.016*"system" + 0.014*"service" + 0.014*"request" + 0.008*"task" + 0.007*"load" + 0.007*"client" + 0.007*"user" + 0.006*"server"
5 - Test Planning and Design	0.016*"plan" + 0.015*"design" + 0.011*"system" + 0.011*"project" + 0.010*"level" + 0.010*"process" + 0.009*"risk" + 0.009*"quality"
6 - Model Based Testing	0.023*"system" + 0.010*"event" + 0.008*"state" + 0.008*"error" + 0.007*"input" + 0.007*"level" + 0.007*"output" + 0.006*"model"
7 - Boundary and Equivalence Analysis	0.026*"class" + 0.010*"equivalence" + 0.008*"boundary" + 0.008*"object" + 0.006*"input" + 0.006*"net" + 0.006*"oriented" + 0.005*"system"
8 - Test Scripting	0.052*"script" + 0.023*"file" + 0.022*"comparison" + 0.016*"outcome" + 0.016*"data" + 0.014*"set" + 0.011*"testware" + 0.010*"execution"
9 - Testing Levels	0.022*"system" + 0.012*"integration" + 0.011*"unit" + 0.007*"call" + 0.007*"incident" + 0.006*"configuration" + 0.005*"device" + 0.004*"constituent"
10 - Bug Reporting	0.048*"bug" + 0.015*"report" + 0.010*"project" + 0.009*"programmer" + 0.007*"error" + 0.005*"fixed" + 0.005*"fix" + 0.004*"information"
11 - Specification Based Testing	0.007*"specification" + 0.007*"set" + 0.007*"boundary" + 0.006*"model" + 0.005*"element" + 0.004*"combination" + 0.004*"state" + 0.004*"function"
12 - State Analysis	0.014*"state" + 0.011*"model" + 0.005*"property" + 0.005*"execution" + 0.004*"lookup" + 0.004*"proc" + 0.004*"line" + 0.004*"finite"
13 - Box Testing	0.045*"module" + 0.013*"box" + 0.009*"white" + 0.006*"dynamic" + 0.005*"driver" + 0.004*"bottom" + 0.004*"black" + 0.004*"stub"

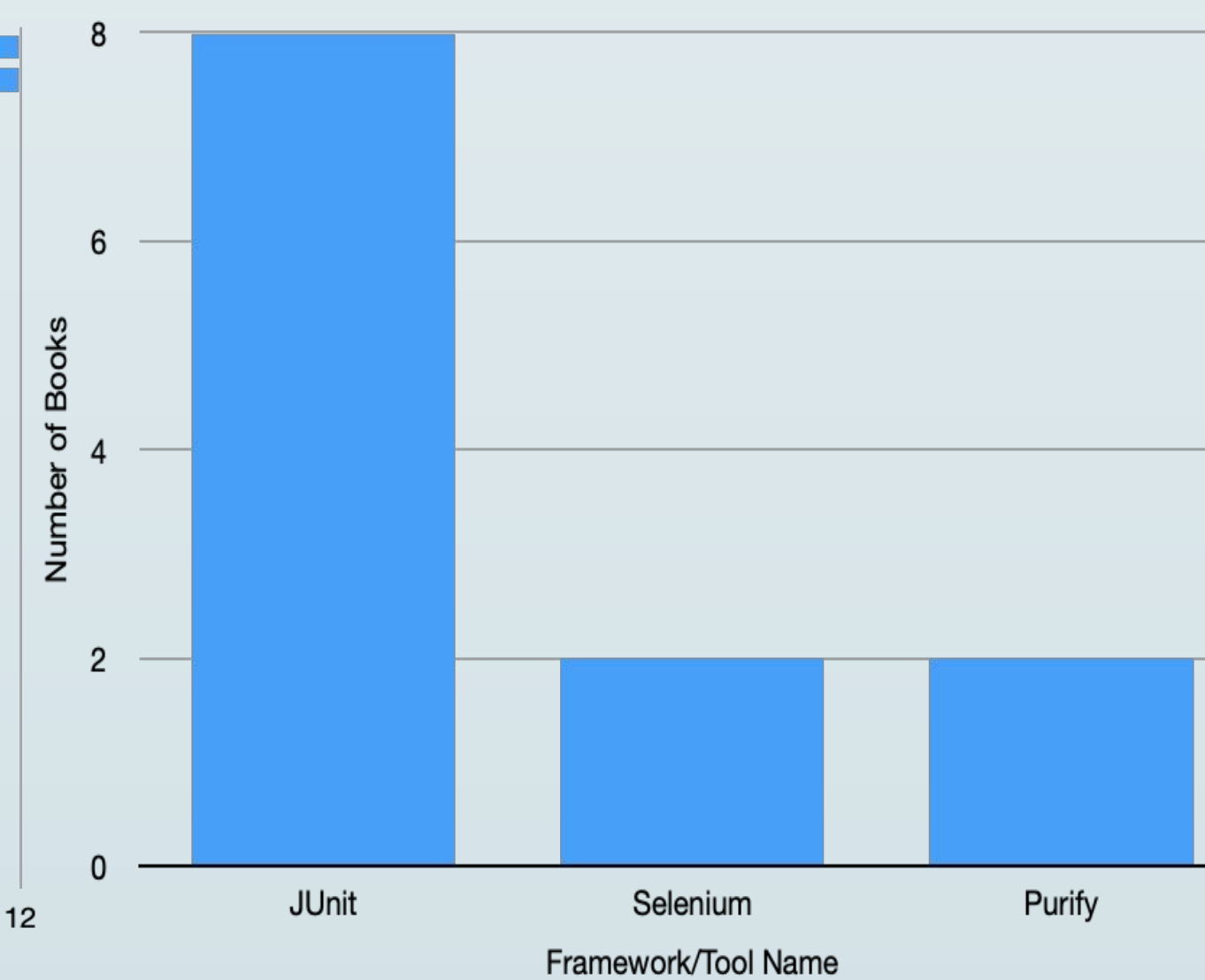Table 2: LDA Results

Figure 3: Topic Coverage Matrix Results

Figure 4: Top Frameworks and Tools

Conclusion

Test automation, test design and planning, coverage analysis, testing levels topics are the most extensively and frequently discussed topics. **Regression testing, acceptance testing, test execution, risk analysis** are also commonly discussed topics.

Books satisfy the industry needs in **test automation, test design and planning** areas**. Acceptance testing, test execution,** are also some of the frequent topics, which were not captured by LDA. The popular books cover rising trends (Intelligence testing, web and mobile application testing) very rarely.

Agile, performance, load and security testing are more specialised topics. **Test management and usability testing** topics were expected to be addressed more extensively and frequently.

JUnit was the most addressed framework. Overall popular software testing books do not focus on practical use of testing tools,, but rather the **tool selection** process.

References

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