11 Software Testing Objectives

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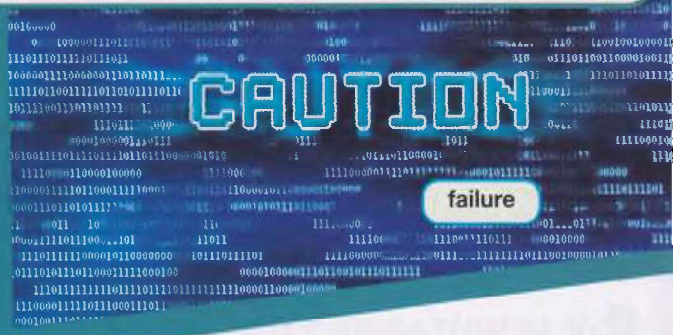
We offer third-party **fault detection** and **fault prevention**. Our services are available for software at all phases of development. We use **oracles** to generate projections of your software. Our team of engineers **compares** those projections to test results. Our testers make sure that your code is free of **errors**. This means that we catch problems before they become **faults** or **failures**.

Our engineers develop specific **test criteria** for each project. We work closely with clients to ensure that we understand the software's requirements. We test carefully to make sure we **satisfy** all **expected** qualities.

Our engineers are experts in all models of fault prevention. We also offer **prevention model** and **evaluation model** testing. We recommend these services for software in earlier stages of development. We offer **demonstration model** and **destruction model** testing. These are recommended for software in later stages of development.



Get ready!

1 Before you read the passage, talk about these questions.

1 What causes software failures to occur?
2 What are some different models of fault detection?

Reading

2 Read the webpage. Then, mark the following statements as true (T) or false (F).

1 ___ Oracles are compared to the test criteria.
2 ___ The company changes test criteria for each project.
3 ___ Evaluation model testing is recommended for software in the later stages of development.

Vocabulary

3 Fill in the blanks with the correct words and phrases from the word bank.

word BANK

error | evaluation model | expected
oracle | prevention model | test criteria

1 Faults that are predicted are _____.
2 If an engineer makes a mistake in a software's code, this is a(n) _____.
3 The _____ attempts to stop faults before they occur.
4 The _____ detects design and implementation faults.
5 Software must meet all _____ before it passes a test.
6 Engineers can use a(n) _____ as a comparison tool.

4 Read the sentence pairs. Choose which word or phrase best fits each blank.

1 **failure / fault**

A A _____ is caused by a human error in coding or input.

B A _____ is an observable occurrence.

2 **fault detection / fault prevention**

A _____ stops problems from occurring.

B _____ identifies problems.

3 **satisfy / compare**

A Engineers use programs to _____ test results with expectations.

B Software must _____ certain requirements set by engineers.

4 **demonstration model / destruction model**

A The _____ ensures that software completes required tasks.

B The _____ detects implementation faults.

5 Listen and read the webpage again. How does the company detect and prevent faults?

Listening

6 Listen to a conversation between a software engineer and a project manager. Choose the correct answers.

1 Which type of test results does the man wants to see?

A prevention model

B demonstration model

C destruction model

D evaluation model

2 What is the woman likely to do next?

A perform the same test again to verify results

B consult another team of engineers

C reevaluate the test criteria

D compare the test results to an oracle

7 Listen again and complete the conversation.

Manager: I need an update **1** _____ for the latest project.

Engineer: I was just **2** _____ the latest test results.

Manager: What do they say?

Engineer: It looks like the software did pretty well. Only **3** _____ were detected.

Manager: What testing model did you use?

Engineer: For this test we used **4** _____.

Manager: Good. **5** _____ to determine where the failures are coming from. Then have an engineer to fix them.

Engineer: Okay. We will probably **6** _____ tests while we do that.

Speaking

8 With a partner, act out the roles below based on Task 7. Then, switch roles.

USE LANGUAGE SUCH AS:

I need an update on ...

It looks like ... / I'd like to see ...

Student A: You are a project manager. Talk to Student B about:

- the test results on a software project
- how faults will be fixed
- what testing models to use

Student B: You are an engineer. Talk to Student A about the test results on a software project.

Writing

9 Use the conversation from Task 8 to complete the testing summary.

Testing Summary Report

Project: TX907

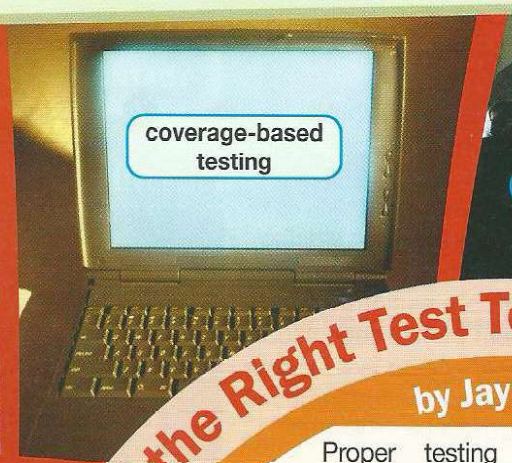
Tests completed: _____.

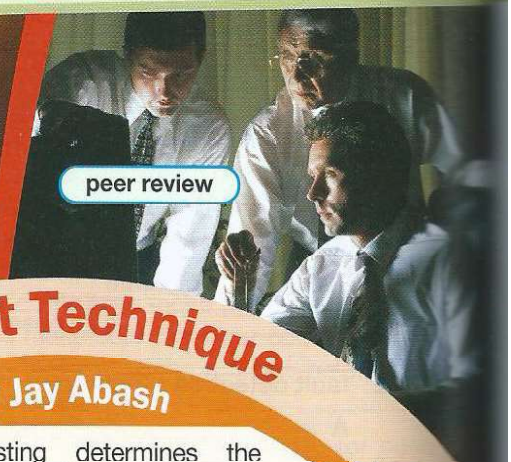
Results: _____.

Recommendation: _____.

Tests to Complete: _____.

12 Software Testing Techniques





Get ready!

1 Before you read the passage, talk about these questions.

1 What are some different types of software testing?

2 How do engineers work together on software testing?

Reading

2 Read the journal article. Then, choose the correct answers.

1 What is the purpose of the article?

A to discuss which testing methods are best for what projects

B to compare the costs of different types of software testing

C to explain how software testing has changed over time

D to encourage engineers to try a particular type of testing

2 Which type of testing is best for software that is interactive?

A white-box testing

B peer review

C error-based testing

D stepwise abstraction

3 According to the article, what kind of testing is inappropriate for large projects?

A stepwise abstraction

B Fagan inspection

C proof of correctness

D fault-based testing

Choosing the Right Test Technique

by Jay Abash

Proper testing determines the strength of a software program. If faults are not detected, they cannot be fixed. Testing techniques can be divided generally into two categories: **static analysis** and **dynamic analysis**. The type of analysis used will depend on what stage of development the software is in.

The function of software often dictates what type of testing is best. **Error-based testing** and **scenario-based evaluation** work well for interactive software. **Black-box testing** is used for software that is more standard. For non-standard types of software, **white-box testing** and **fault-based testing** are appropriate.

The size of the software is also important. Large software projects will do well in **Fagan inspection** but not **stepwise abstraction**. Smaller projects may only require **peer review** from one other engineer.

Software developed by companies will need **proof of correctness**. The standard for personal-use software does not need to be as strict. **Coverage-based testing** should always be a consideration, regardless of software size.

Vocabulary

3 Match the phrases (1-8) with the definitions (A-H).

1 __ black-box testing
2 __ coverage-based testing
3 __ dynamic analysis
4 __ error-based testing
5 __ fault-based testing
6 __ proof of correctness
7 __ scenario-based evaluation
8 __ white-box testing

A testing conducted while a program is running

B a process that formally states a program's specifications

C testing with specifically developed criteria

D testing that focuses primarily on identifying problems

E testing that is measured by the amount of code it tests

F testing done according to pre-set standards

G testing that assesses common situations

H testing that looks specifically for common human mistakes

4 Write a phrase that is similar in meaning to the underlined part.

1 A(n) <u>testing process involving a team of engineers</u> is a good way to test software projects that are very large.
_ _ g _ n _ _ s _ _ c _ _ _ _

2 <u>Testing done on code that is not being executed</u> can be used to test software in the early stages of development.
_ _ a _ _ c a _ _ _ y _ _ _

3 <u>Testing done starting with the most primitive parts of a code</u> is a technique that analyzes all parts of a piece of software.
_ t _ _ _ _ s _ _ b _ _ r _ _ t _ _ _

4 Software engineers should feel comfortable asking each other for <u>manual review of software done by an engineer who did not write the code</u>.
_ _ e _ _ e v _ _ w

5 Listen and read the journal article again. How can engineers decide what type of testing to use?

Listening

6 Listen to a conversation between a company owner and a software engineer. Mark the following statements as true (T) or false (F).

1 __ The woman found faults during white-box testing.
2 __ The man was disappointed with the results of a Fagan inspection.
3 __ The man recommends coverage-based testing to the woman.

7 Listen again and complete the conversation.

Owner: How is the testing going on the accounting software?
Engineer: Actually, I have some bad news about that. **1** _____ _____ - _____ _____ we did found a lot of faults.
Owner: That's not good. What are you going to do?
Engineer: We're going to do some black-box testing before we start **2** _____ _____ _____.
Owner: Good. Are you using both **3** _____ _____ _____ analysis?
Engineer: For now we're just doing static analysis.
Owner: Okay. Try to get this taken care of quickly. I want this software **4** _____ _____ _____ _____ by next month.
Engineer: I understand. I've got the **5** _____ _____ _____ on it.
Owner: Maybe you should get another team leader to **6** _____ _____ _____ _____.

Speaking

8 With a partner, act out the roles below based on Task 7. Then, switch roles.

USE LANGUAGE SUCH AS:

I've got some bad news about ...
We're going to do ...
Maybe you should ...

Student A: You are a company owner. Talk to Student B about:

- the results from recent software tests
- what the engineer is doing to fix problems
- what types of testing you recommend

Student B: You are an engineer. Talk to Student A about the results from recent software tests.

Writing

9 Use the conversation from Task 8 to complete the chart about software testing methods.

Test Method	Advantages	Disadvantages
black-box testing		may not be best for all types of software