# *Web Development Full Stack 1st edition Coller Solutions Manual*

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# Solution and Answer Guide

COLLER, WEB DEVELOPMENT: FULL STACK 1E ©24, 9780357673850; Chapter 1: How Does the Web Work?

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## REVIEW QUESTIONS

1. What does a DNS server do? (1.1)

    a. Translates IP addresses into URLs
    b. Hosts the database in a full stack web development environment
    c. Translates URLs into IP addresses
    d. Runs the software that serves webpages to browsers requesting them

    **Answer**: c

    **Feedback**:

    a. Incorrect. Translating IP addresses into URLs is the opposite of what a DNS server does.
    b. Incorrect. “Hosts the database in a full stack web development environment” sound like plausible technology words, but this is incorrect.
    c. Correct. A DNS server translates URLs into IP addresses.
    d. Incorrect. A web server runs the software that serves webpages to browsers requesting them.

2. What does HTML DOM stand for? (1.1)
    a. District Object Model
    b. Document Object Model
    c. Distinct Object Model
    d. Domain Object Model

    **Answer**: b

    **Feedback**:

    a. Incorrect. HTML DOM does not stand for District Object Model.
    b. Correct. HTML DOM stands for Document Object Model.
    c. Incorrect. HTML DOM does not stand for Distinct Object Model.
    d. Incorrect. HTML DOM does not stand for Domain Object Model.

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3. Why is it important to understand how a search engine works? (1.2)
    a. To help users find your website when they use a search engine
    b. To guarantee you get to the top of the ranked list of search results
    c. Because Google keeps the details of its search engine technology wrapped in obscurity and nondisclosure agreements
    d. It's the only way to game the system to get ahead of everyone else in the rankings

    **Answer**: a

    **Feedback**:

    a. Correct. Helping users find your content is the primary reason to build a website.
    b. Incorrect. Getting to the top of the ranked list of search results can't be guaranteed.
    c. Incorrect. Google's documentation is clear about how their search engine ranks pages.
    d. Incorrect. Trying to game the system to get ahead will get your site delisted from Google search results.

4. What does SEO stand for? (1.2)
    a. Single enterprise operation
    b. Search engine operation
    c. Search engine optimization
    d. Search engine object

    **Answer**: c

    **Feedback**:

    a. Incorrect. SEO does not stand for single enterprise operation.
    b. Incorrect. SEO does not stand for search engine operation.
    c. Correct. SEO stands for search engine optimization.
    d. Incorrect. SEO does not stand for search engine object.

5. How can you guarantee Google will list your website at the top of its search results? (1.2)
    a. You can't. You can only build a good, standards-compliant website and ask Google to crawl it.
    b. Pay up front to get to the head of list.
    c. Pay a search engine optimization subcontractor to create links to your site.
    d. Use WordPress to ensure your website is standards-compliant.

    **Answer**: a

    **Feedback**:

    a. Correct. You can't guarantee Google will list your website at the top of its search returns. You can only build a good, standards-compliant website and ask Google to crawl it. Google is very clear about this in their documentation.

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b. Incorrect. Paying up front to get to the head of list does not guarantee Google will list your website at the top of its search returns. Google is very clear about this in their documentation.
c. Incorrect. Paying a search engine optimization subcontractor to create links to your site will get your site banned from Google.
d. Incorrect. Using WordPress to ensure your website is standards-compliant actually sounds plausible, but you can't guarantee WordPress will polish any content you provide (or don't) well enough to get to the top of the search results.

6. How does a web server know which page to return to the browser making a GET request? (1.3)
    a. It searches the entire computer it is loaded on for any matching files.
    b. The file name is usually specified in the GET request.
    c. It uses artificial intelligence to find the file or page.
    d. It lets the browser connect with direct access to the default folder containing all of its files so the browser can choose.

    **Answer**: b

    **Feedback**:

    a. Incorrect. Having the web server search the entire computer it is loaded on for any matching files would be a significant security risk.
    b. Correct. If the file name is not specified, the web server will return the index or default page instead.
    c. Incorrect. Using artificial intelligence to find the file or page might be possible in the future but would present another significant security risk.
    d. Incorrect. Having the web server allow the browser to connect with direct access to the default folder containing all of its files so the browser can choose would be a security nightmare.

7. How does a web server return an HTML page to a browser? (1.3)
    a. As a series of single lines of text from the file
    b. In data packets
    c. All at once in a simple text file
    d. Using JSON

    **Answer**: b

    **Feedback**:

    a. Incorrect. Returning an HTML page as a series of single text lines sounds plausible, but is not the correct answer.
    b. Correct. Data packets are used in the network transaction to transfer the HTML page a small chunk at a time.
    c. Incorrect. Simple text files don't travel over a network.
    d. Incorrect. JSON is used to transmit data objects as simple text.

8. What is the basic service a web hosting company offers? (1.3)
    a. Building your full stack webpages using your choice of programming language and database

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b. HTML, CSS and JavaScript file version control
c. Tech support for the full stack developers working on one of their sites
d. Rental of a folder on one of their web servers and contacting Internic to ensure your URL is unique

**Answer**: d

**Feedback**:

a. Incorrect. Building full stack webpages is more than the basic service.
b. Incorrect. Web hosting companies do not typically offer source file version control.
c. Incorrect. Full stack developers are the tech support for their own sites.
d. Correct. Contracting with a web host involves renting space on one of their web servers for your webpages, and web hosts will also perform the service of contacting Internic on your behalf to get your new URL registered.

9. Why does a web server not just return the text of the PHP code in a dynamic webpage file like it does with an HTML page? (1.4)
   a. The PHP code is precompiled into machine language.
   b. The web server is configured by a server administrator to execute the PHP code in the dynamic webpage.
   c. The PHP code is encrypted to look like a set of random characters prior to moving into production.
   d. The web server can only return HTML, CSS, or JavaScript files.

   **Answer**: b

   **Feedback**:

   a. Incorrect. PHP is not compiled, it is interpreted.
   b. Correct. Web servers must be configured to execute the PHP or they actually will just return the text in the code.
   c. Incorrect. PHP is not encrypted; it is a programming language that stays on the web server in its original text form.
   d. Incorrect. The web server can return any file types it is configured to return.

10. How does the PHP engine build a dynamic webpage? (1.4)
    a. From top to bottom of the code on the page
    b. From the precompiled executable file on the server
    c. By assembling the component parts from code libraries stored in the code library database
    d. By traversing the HTML DOM tree from top to bottom and adding the CSS and JavaScript after it is done

    **Answer**: a

    **Feedback**:

    a. Correct. PHP is interpreted by the web server starting at the top of the code on the page.
    b. Incorrect. PHP is not precompiled into executable files.
    c. Incorrect. Code libraries are not necessary for PHP to work properly.

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d. Incorrect. A web browser traverses the HTML DOM tree and adds CSS and JavaScript.

11. How is data from a web form returned to the web server for processing? (1.4)
    a. As key-value pairs in the POST response from the browser
    b. As data packets in an HTML file sent back to the server from the browser
    c. In a UTF-8-encoded response file
    d. In a JavaScript POST response file

    **Answer**: a

    **Feedback**:

    a. Correct. A web form returns key-value pairs in the POST response from the browser.
    b. Incorrect. Browsers don't send HTML files back to the server.
    c. Incorrect. This is close to the correct answer, but files are not used to transmit data back to the web server.
    d. Incorrect. The POST response from a web browser is not in the form of a file, and JavaScript is therefore not used in the transaction.

12. How does a full stack web developer choose the appropriate technology for a web project? (1.5)
    a. By doing research, using experience, and making judgments
    b. Using a project flowchart to determine best fit from ranked choices of available technologies
    c. Using cost-center accounting to determine which solution is least expensive in the near and far term
    d. Tracking the users of the current software using Google Analytics to determine which browser most of them are using, then choosing the best development tools to serve content to that browser

    **Answer**: a

    **Feedback**:

    a. Correct. There is a lot of work before making the decision, but there is also a place for experience and educated judgment.
    b. Incorrect. A project flowchart might be helpful but wouldn't make the background research less critical or reduce the importance of good judgment.
    c. Incorrect. The overall expense of a solution is important to consider, but cost-center accounting wouldn't factor into that calculation.
    d. Incorrect. Building browser-specific software only works for the internal use of small organizations with a standard platform for the users.

13. What does a project manager do? (1.5)
    a. Keeps the concurrent versions of the software being developed by different full stack developers from interfering with each other
    b. Starts a project off on the right foot with an all-staff meeting, then steps aside to observe the progress until the project is done
    c. Keeps a project on track and all key personnel accountable and informed of the project status

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d. Nobody really knows, but they make a lot of money doing it

**Answer**: c

**Feedback**:

a. Incorrect. Keeping concurrent versions of the software is a function of the version control software, not the project manager.
b. Incorrect. A good project manager is actively involved in the project.
c. Correct. Project managers start a project with an all-staff meeting, then step aside to observe the progress until the project is done.
d. Incorrect. Some project managers make a good salary, but their tasks are well known.

14. What is an advantage of using the waterfall approach to project management? (1.5)
    a. All parts of the project are finished at the same time. The customers won't have a chance to change the project requirements mid-project.
    b. The developers will be able to concentrate on development without having to attend unnecessary meetings.
    c. Waterfall is the project management strategy with the longest track record of success.
    d. The customers can change the project requirements mid-project.

**Answer**: a

**Feedback**:

a. Correct. The entire project is completed before being released to production.
b. Incorrect. Changing project requirements is often necessary.
c. Incorrect. There will always be unnecessary meetings regardless of the approach to project management.
d. Incorrect. Customers might be able to change the requirements in the middle of a project that takes a waterfall approach, but this is not an advantage.

15. What are the five software components of full stack web development? (1.6)
    a. Front end, back end, database, version control, project management
    b. Agile, waterfall, scrum, strategic, Kanban
    c. HTML, CSS, JavaScript, PHP, MySQL
    d. Front end, API, back end, data layer, database objects

**Answer**: a

**Feedback**:

a. Correct. The five software components of full stack web development are front end, back end, database, version control, and project management.
b. Incorrect. Agile, waterfall, scrum, strategic, and Kanban are project management terms, not software components.
c. Incorrect. HTML, CSS, JavaScript, PHP, and MySQL are a mix of languages and technologies, but are not software components.
d. Incorrect. Front end, API, back end, data layer, and database objects are technology terms, but are not the five software components of full stack web development.

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16. What is an interpreted programming language? (1.6)
    a. One used in many countries that speak different languages
    b. The programming language written prior to being compiled into machine language
    c. The programming language used in the web browser to create a webpage to display in the user interface
    d. A programming language that is not compiled prior to running.

    **Answer**: d

    **Feedback**:

    a. Incorrect. Interpreted programming languages have almost nothing to do with spoken languages.
    b. Incorrect. Interpreted languages are not compiled into machine language.
    c. Incorrect. Interpreted programming languages run at the server, not in the web browser.
    d. Correct. Interpreted languages are not compiled prior to execution.

17. What does version control software do? (1.6)
    a. Controls the version of the software being released into production
    b. Creates a series of code milestones while allowing multiple programmers to work on the same project in its repository
    c. Restricts the full stack programmers to specific tasks in the requirements documents so they aren't all working on the same part at the same time
    d. The same thing as source control software, but with numbered "versions" for easier organization

    **Answer**: b

    **Feedback**:

    a. Incorrect. This sounds plausible, but developers control the version of release, not the software.
    b. Correct. Two of the important features of version control software are creating code milestones and allowing multiple developers to work on the same project at the same time.
    c. Incorrect. One of the important aspects to version control is the capability of having multiple developers work on the same project at the same time in concurrent versions without restriction.
    d. Incorrect. Version control and source control are the same thing.

## PROGRAMMING EXERCISES

1. Research the top three current technologies or programming languages used for each of the five software components of full stack web development by market share. Add one new technology or programming language that is predicted to be the amazing new thing in the near future. Create a two-page report of your findings and cite your sources. (1.6)

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**Solution**
Answers will vary.

2. For the years 1995, 2005, and 2015, find the top three most-used browsers by market share and research why the market shifted between each of these years. Then, make a prediction—what browser will be the most popular in 2030? Summarize your findings in a two-page report and cite your sources. (1.1)

**Solution**
Answers will vary.

## PROJECTS

1. Assume the role of a business analyst and research the use of Google Analytics (https://analytics.google.com/analytics/web/provision/#/provision) Write a two-page proposal to yourself as the customer arguing for or against using Google Analytics in your own website. (1.5)

**Solution**
Answers will vary.

2. Google is the undisputed leader of search engines, and yet many others are available. Using a search engine other than Google, investigate six alternative search engines. Will any of these overtake Google? Summarize your findings in a two-page report and cite your sources. (1.2)

**Solution**
Answers will vary.

3. Research when the use of “full stack web development” began as a concept. How has it evolved since the initial idea? What programming languages or technologies have been used most often during this time? Make a prediction about the future direction of full stack web development. Summarize your research in a two-page report and cite your sources. (1.6)

**Solution**
Answers will vary.

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