1. After the protocol and version the headers are the first part of a response and can’t be amended. Most likely output was already sent and headers along with it, then header() was called afterwards so this throws an error. Avoid this by not writing html or php output before sending headers.

2. Dosomething takes an argument which is a reference and not passed by value so, incrementing $arg will change the variable outside the function scope. $return which is the variable returned is assigned by value and not by reference to $arg before it is incremented so it remains 3 whereas $arg is 4 after the function runs

3. These are access specifiers. A public class member can be accessed from anywhere outside the class or inside. A protected class member can only be accessed inside the class or by its children. A private member is available only inside the class.

4. static methods can only access static member variables and $\_someMember is not static. $this can also not be accessed because a static method doesn’t have access to any instances of the class.

5. Rate limiting may help, enabling ssl and http2 to reduce the number of requests made for resources would be another improvement in performance. If responses are compressed reducing the compression level could reduce server load or increasing it to speed up response times could help too. Caching responses when possible would also help

6. You could add a file to .gitignore that isn’t synced to the git repo and store the password there or have file outside the project store the password. Then include a reference to the file instead of the password itself in a file that is in the git repo

7. I assume that there'd be a ssh server or something where we have preshared keys to validate our identities and restrict access that sensitive information could be securely shared using

8. <h2>9thCO</h2> would be a backpack with only a book inside of it, whereas <span class="h2"role="heading">9thCO</span> would be a magic box that morphs to the size of its contents, shapes itself to a convenient carrying form and has a genie inside to tell you what it does. This box has morphed into a smaller backpack with the book inside

9. If you a user is unable to view the image the alt is meant to summarize what the image conveys. However, if the image doesn’t add any new information leaving the alt empty is the correct choice. Screen readers will also rely on an empty alt tag to avoid reading off the image when it is not intended

10. You'd need to consider how the variable is scoped whether its local or global, you'd also need to consider whether you want to modify the original or create a modified copy. Easiest way to accomplish this is to mutate the array passed as an argument with forEach() or create a copy with map() or use a related method

11. A more specific match may be taking precedence or an inline style is overriding the definition.

12. the script mime type isn’t declared with type="text/javascript" so that may not work. Script tags also shouldn’t be in <head> unless they contain code that only runs on when an event triggers or wont delay/stop the page from loading. it is also a CORS request because gstatic definitely isn’t the host domain so depending on the webserver headers and browser settings/extensions it may not load

13. The user input from the page in the post request isn’t being sanitized. In theory they could enter something like "1; TRUNCATE table; DELETE FROM othertable". You can’t rely on client-side input validation it needs to be done server side. Also writing the sql query in the application logic is bad. Create a stored procedure in the database and CALL that

14. DELETE will delete any number of rows from a table whereas DROP will delete the entire table

15. A one to many relationships is one where a single entity in a database for example, references multiple related entities by having foreign keys linking to them. A relationship like could be used to model something like a teacher and all the classes they teach since one teacher usually teaches many classes and then one class to many students since many students are usually in one class

17. Entities:

A table named Visits with the columns date\_visited (datetime), ip\_address (varchar(50)), page\_uri (varchar(512)), user\_agent (varchar(255)), geolocation (varchar(255)), response\_code (char(3)), request\_type (enum or varchar(7)), user\_id (int(11))

A table named Users with the columns user\_email (varchar(255)), user\_password (varchar(255)), user\_id (int(11)), first\_name (varchar(255)), last\_name (varchar(255)), country\_code (char(2)), phone\_number (varchar(50)), last\_login\_time (datetime)

A table named Companies with the columns company\_id (int(11)), company\_name(varchar(255)) login\_name (varchar(255)), login\_password (varchar(255)), last\_payment\_date (datetime), member\_access(boolean)

18.a) Angular, it is good for dashboards since they work well as single page applications and I've been learning it recently.

B) Since the platform is basic, I'd use PHP because I find it relatively quick to write and I've been using it recently. Technically I have more experience with j2ee but it's been a while since I've worked with it and I’m rusty. Also, it's more work to write.

C) Constraints:

company\_id is the primary key for Companies

user\_id is the primary key for Users

In the Visits table user\_id is a foreign key to Users

Visits table user\_id is nullable

Visits geolocation is nullable

request type could be POST as an example

response code would be 404 for example

d) I’m not sure since I don’t have experience with tag manager. From what I understand it provides in depth tracking of user interaction with a site like what links they clicked and how long they viewed a page. Analytics would be the dashboard to view the traffic breakdown of your site and tags you set. This would require you to embed tag manager code and set your own tags on the site

e) pages visited, request type and the response code cover most interaction. However, you could create a lookup table of user actions to make it easier to parse what actions a user is taking on the site

f) Probably tying the application logic and database structure together. Formulating queries or using PDO's can be challenging. UI design is generally not too difficult for me