**Exemplify two data structures that you know and describe some situations where you would use them.**

In the following images I will show the structure that I am using in a personal project.



A computer screen shot of a program

Description automatically generated

The 1st image we can see an array of ‘Cards’ that are going to be used to store the information about a specific ‘Card’.

In the second image we can see an ‘Enemy state machine’ that is storing 3 different types of action for an ‘enemy’ character. We can use each ‘state’ as its own action and code it individually while this code is able to switch between.

**You open a web browser and access**[**http://www.tss-yonder.com**](http://www.tss-yonder.com/)**. What is the IP address behind this website and how does the browser know how to get the correct IP?**

A computer screen with white text

Description automatically generated

By using the command prompt, as an administrator, we can ping any site and we will get back its IP address.

The IP address that the site is returning is the IP address of the machine that the site is running from.

**Exemplify two transport protocols and think of two applications that would use each of them.**

We have 3 types of transport protocols: TCP, UDP, SCTP. They are used in creating a connection between a sender and a receiver. While TCP can be used for email, UDP can be used for online games.

A close up of a chart

Description automatically generated

**You wrote a chat web application in your favorite programming language. You need to host this somewhere and run it so that the entire world can start using it. Describe how you would do that and the tools you would use.**

I would try to purchase a Hosting Service, so it can run the web application for me, and to find a hosting service I would search on YouTube for videos regarding this subject to get a better understanding of how did this hosting companies provide their services.

**Now your application is famous but unfortunately it has a lot of bugs. You want only you and a couple of your friends to be able to access it until you patch it. Describe two ways you can achieve this.**

You can create an alternative site that will be run only when you are running it, so that no one will have access to it 24/7, and it has its name changed a bit or has a different url. Alternatively, if the site already has a login functionality using a different username and a specific password you can redirect a person to the site.

**Your application is ready for the public once again. You realize that you forgot about security and any network administrator can see the messages that a user sends or receives. How would you improve your application to prevent this? Is there any way to do this so that not even the application owner (you) can see the messages between two random users?**

The site can use a secrecy technique, by encoding the message the moment the sender has pressed Enter and decoding it the moment the receiver is getting the message we can be sure that no 3rd party is able to understand the message. I think that using a technique like Playfair uses the usernames as the key to encode and decode the message. To be sure that not even the owner of the site can read the messages the program can use an random number generator to generate a letter once every hour, or something like that, and to add it to the end of the start of each username, again by random choice, so that at no point the owner has access to the key to decode the messages.

**What are cookies and what are they used for? Find a cookie used by**[**http://www.tss-yonder.com**](http://www.tss-yonder.com/)**and copy its name and value. What do you think is its purpose?**

A program that is downloaded on each computer that can gather information about the user.

The cookie is “Cookie Preferences” and its value is “display: none”

**While writing your application you need to create more worker processes for processing some data. How can you create child processes in your favorite language? What are the possible states of a process?**

We can start by creating a “machine” that will be “called” by each code in 3 states: Starting, Running, Ending.

Using the Starting method, we can call on a child to activate its code and verify that is working without any issues.

In the Running method, we can analyze the child after we make sure that the code has no compilation errors.

The Ending method will be called after a certain amount of time, or using a different parameter, so that we can close any data that is not needed to be run.

**Your application is running but it still has a few problems. Occasionally, it returns an error page. How can you find the PID of your application? What would you do to debug it?**

We can find our PID using Task Manager, we will select the Details tab and select the PID column.

We can try to close the application and run it again and look at the logs to verify where is the issue coming from.

**What DBMS would you use to store your application data and why? How would you store the passwords of each user?**

We can use SQL since it has an unique ID system and a table system, that is able to connect different information without overloading each table by using a foreign key to store the necessary data of each user.

We have the table USER that contains name, email address, password and their unique identifier: ID\_User. This identifier can be used as a foreign key for other tables that store different information.