Cyber threats are a growing concern for organizations worldwide. These threats take many forms, including malware, phishing, and denial-of-service (DOS) attacks, compromising sensitive information and disrupting operations. The increasing sophistication and frequency of these attacks make it imperative for organizations to adopt advanced security measures. Traditional threat detection methods often fall short due to their inability to adapt to new and evolving threats. This is where deep learning models come into play.

Deep learning models can analyze vast amounts of data and identify patterns that may not be immediately obvious to human analysts. By leveraging these models, organizations can proactively detect and mitigate cyber threats, safeguarding their sensitive information and ensuring operational continuity.

As a cybersecurity analyst, you identify and mitigate these threats. In this project, you will design and implement a deep learning model to detect cyber threats. The BETH dataset simulates real-world logs, providing a rich source of information for training and testing your model. The data has already undergone preprocessing, and we have a target label, `sus_label`, indicating whether an event is malicious (1) or benign (0).

By successfully developing this model, you will contribute to enhancing cybersecurity measures and protecting organizations from potentially devastating cyber attacks.

The Data

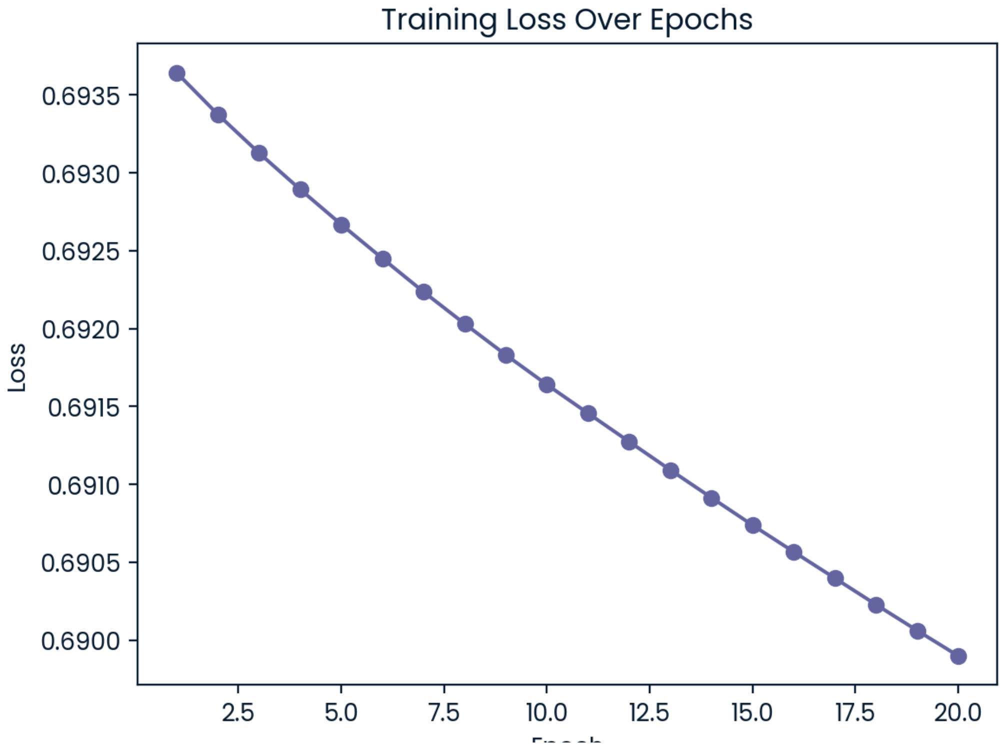
Column	Description
`processId`	The unique identifier for the process that generated the event - int64
`threadId`	ID for the thread spawning the log - int64
`parentProcessId`	Label for the process spawning this log - int64
`userId`	ID of user spawning the log
`mountNamespace`	Mounting restrictions the process log works within - int64
`argsNum`	Number of arguments passed to the event - int64
`returnValue`	Value returned from the event log (usually 0) - int64
`sus_label`	Binary label as suspicous event (1 is suspicious, 0 is not) - int64

More information on the dataset: BETH dataset (Invalid URL)

	p		parentPro…		mountN…		ret…	s.
0	381	7337	1	100	4026532231	5	0	
1	381	7337	1	100	4026532231	1	0	
2	381	7337	1	100	4026532231	0	0	
3	7347	7347	7341	0	4026531840	2	-2	
4	7347	7347	7341	0	4026531840	4	0	

Rows: 5

```
Epoch [5/20], Loss: 0.6927
Epoch [10/20], Loss: 0.6916
Epoch [15/20], Loss: 0.6907
Epoch [20/20], Loss: 0.6899
Validation Accuracy: 54%
Model did not achieve the target accuracy.
```


Training Loss Over Epochs
Loss
0.6935
0.6930
0.6925
0.6920
0.6915
0.6910
0.6905
0.6900
2.5
5.0
7.5
10.0
12.5
15.0
17.5
20.0
Epoch