

Q1 a) Tracing in NodeJS allows us to monitor and track the execution of our Javascript code. For e.g It can be used to record time for each function passed. Tracing helps us understand how our code is executed and also find out any bottlenecks.

We can use Logging to generate logs of our application.

trace_events module can be used to generate trace files.

We can also use third party tools like New Relic to monitor, trace features like database transactions and queries etc.

Q1b) The testing pyramid is a testing strategy that can help us test our applications and quickly identify where the code changes have caused issues. The test pyramid has 3 levels. Unit testing is at the bottom of the pyramid followed by Integration testing and End to End testing on top of the pyramid. Unit tests are used to test a single component or function in isolation. Integration testing tests different components together to verify their interaction with other components without any unexpected changes in results. End to end testing simulate real user scenarios and test the entire application. A balanced approach to testing is required to develop more reliable and maintainable application. It helps in early bug detection. Unit tests can help find bugs early saving time and money while end to end testing is expensive and harder to maintain. A balanced approach in testing ensures that all parts of the application are tested.