**Artificial Intelligence and Data Science Department.  
Web Computing / Even-Sem 2021-22 / Experiment 5.  
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EXPERIMENT - 5.  
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**Aim:**

A. Node.js

1. Installation and Configuration of Node Js.
2. Learning about Call Backs and Event Loops in Node Js.

B. Creating An Express Application.

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**Theory:**

***Node.js (Node)*** is an open-source development platform for executing JavaScript code server-side. Node is useful for developing applications that require a persistent connection from the browser to the server and is often used for real-time applications such as chat, news feeds, and web push notifications.

Node.js is intended to run on a dedicated HTTP server and to employ a single thread with one process at a time. Node.js applications are event-based and run asynchronously. Code built on the Node platform does not follow the traditional model of receive, process, send, wait, and receive. Instead, Node processes incoming requests in a constant event stack and sends small requests one after the other without waiting for responses.

It interprets JavaScript code via Google’s V8 JavaScript engine.

***Steps To Install Node Js:***

* 1. Download the Node.js ‘.msi’ installer from:

<https://nodejs.org/en/download/>

* 1. Run the Node.js installer. Install it. Verify By typing ‘node -v’ in CM

***Event Loops:***

The event loop is what allows Node.js to perform non-blocking I/O operations (despite the fact that JavaScript is single-threaded) by offloading operations to the system kernel whenever possible.

***Callback:***

A callback is a function that is called when a task is completed, thus helping in preventing any kind of blocking and a callback function allows other code to run in the meantime. The callback is called when the task gets completed and is the asynchronous equivalent of a function. Using the Callback concept, Node.js can process a large number of requests without waiting for any function to return the result which makes Node.js highly scalable.

***Express.js***

It’s a web framework that lets you structure a web application to handle multiple different HTTP requests at a specific URL.

Express is a minimal, open-source, and flexible Node.js web app framework designed to make developing websites; web apps, & APIs much easier.

***Why Express?***

* Express helps to respond to requests with route support so that you may write responses to specific URLs
* It Supports multiple templating engines to simplify generating HTML

***Step to Install Express:***

* + 1. Install Node JS first. Check For the npm package.
    2. Open Vs Code & in terminal type ‘npm install express ‘
    3. Express will be installed on the respective device

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**Code Snippets:-**

**5A**

*Program: HelloWorld.js*

*setTimeout(()=>{ console.log('Thank You') }, 0);*

*console.log('Hello World!');*

*Program: CallBack.js*

*cal=function(x,y)*

*{*

*console.log("x="+x,"y="+y);*

*let sum=add(x,y,function(result)*

*{*

*console.log("sum="+result); console.log("End Of Program")*

*});*

*}*

*add=function(x,y,callback)*

*{*

*setTimeout(function()*

*{*

*console.log('Addition Performed after 200ms'); callback(x+y);*

*},200)*

*}*

*cal(2,8)*

**5B**

*Program: Express App*

*import express from 'express' const app=express()*

*const port=process.env.PORT||'3000'*

*app.get('/',(req,res)=>{ res.send('Hello Bois !')*

*})*

*app.listen(port,()=>{*

*console.log('Server Listening at http://localhost:${3000}')*

*})*

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**Outputs:**

**5A Output:**

*Program: HelloWorld.js*

Hello World!

Thank You

*Program: CallBack.js*

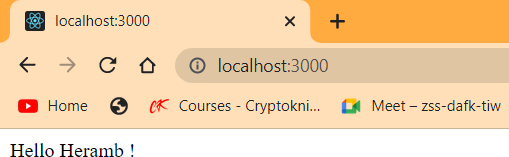
x=2 y=8

Addition performed after 200ms

sum=10

End of Program

**5B Output:**



Hello Parth!

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**Conclusion:**

Thus, we learned:

* + - 1. To Install And Configure Node Js.
      2. About Event Loops And Call Backs in Node Js.
      3. To Install And Configure Express.
      4. To Create an Express Application

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