Semester: V **Subject:** Web Computing **Academic Year:** 2023 – 2024

Express.JS

INDEX

Express.Js

What is Express.js

Express is a fast, assertive, essential and moderate Web framework of Node.js. You can assume express as a layer built on the top of the Nodejs that helps manage a server and routes. It provides a rodust set of features to develop Web and mobileapplications

Let's see some of the core features of Express framework:

- It can be used to design Single-page, multi-page, and hybrid Web applications.
- It allows to setup middlewares to respond to HTTP Requests.
- It defines a routing table which is used to perform different actions based on HTTP method and URL.
- It allows to dynamically reader HTML pages based on passing arguments to templates.

Why use Express

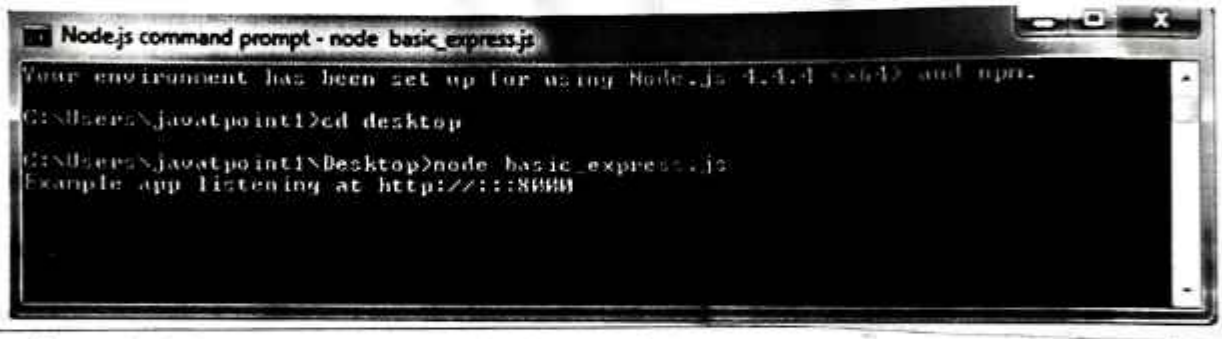
- Ultra fast I/O
- Asynchronous and single threaded
- MVC like structure
- Robust API makes routing easy

HOW does Express look like

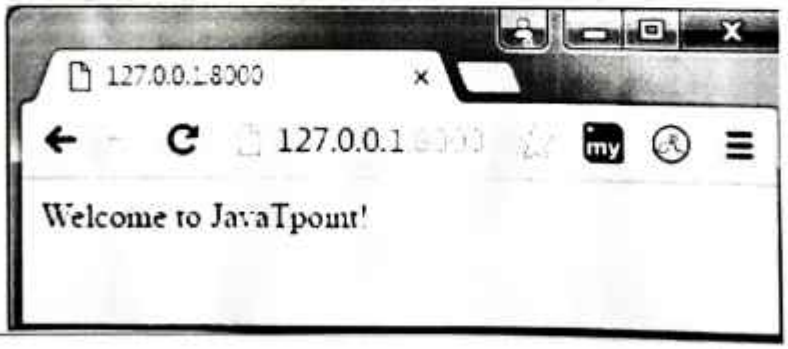
Let's see a basic Express.js app.

File: basic_express.js

```
Var express = require ('express');
Var app = express();
app.get('/', function (req,res) {
  res.send('Welcome to JavaTpoint');
});
Var server = app.listen(8000,function() {
 Var host = server.address().address
 Var post = server.address().port
 console.log('Example app listening at http://%s,%s',
                host, port.);
});
```



OUTPUT



Install Express.js

Firstly, you have to install the express framework globally to create Web applications use Node terminal. Use the following command to install express framework globally.

```
npm install -g express
```

Installing Express

Use the following command to install express:

```
npm install express --save
```

The above command install express in node_module director, and create a directory named express inside the node-module. You should install some other important modules along with the express. Following is the list:

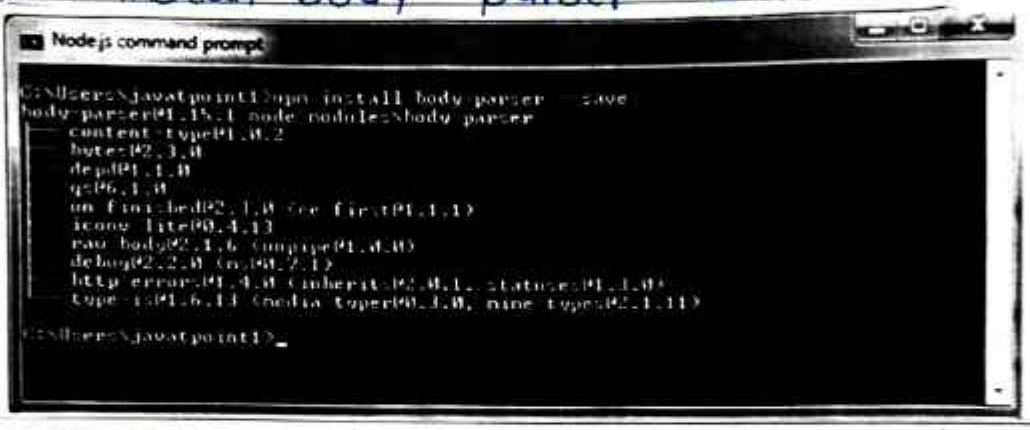
- **body-parser:**

This is a node.js middleware for handling JSON, Raw, Text and URL encoded form data.

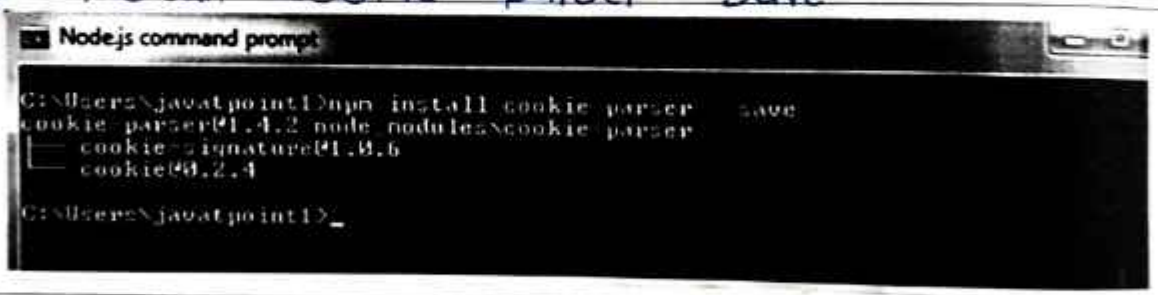
- **Cookie-parser:**
It is used to parse Cookie header and populate req.cookies With an object keyed by the cookie names.

- **multer:**
This is a node.js middleware for handling multi-part/form data.

npm install body-parser --save



npm install cookie-parser --save



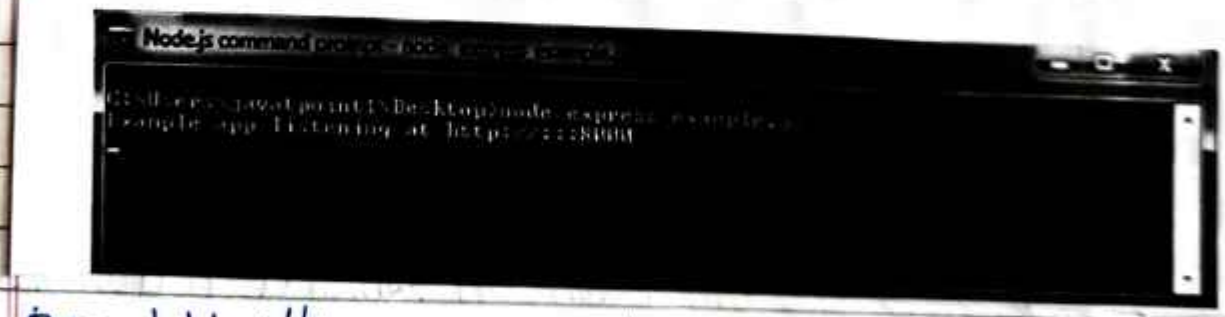
npm install multer --save

Express.js App Example

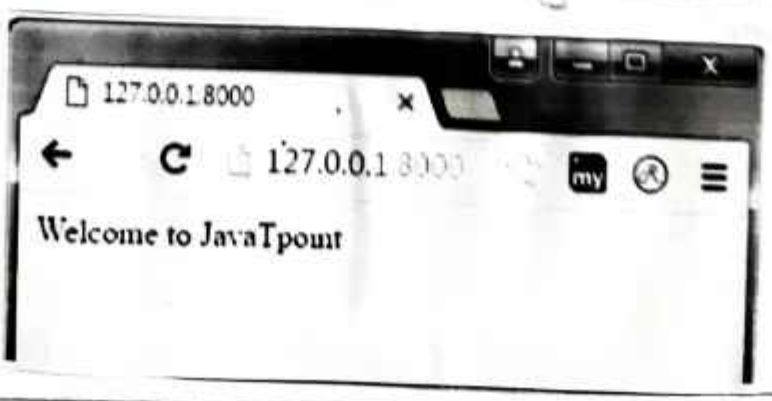
Lets take a Simple Express app example Which Starts a server and listen on a local port. It only responds to homepage. For every other path, it will respond With a 404 Not Found error.

File: express_example.js

```
Var express = require ('express');
Var app = express();
app.get('/', function(req, res){
    res.send('Welcome to JavaTpoint');
})
Var server = app.listen(8000, function(){
Var host = Server.address().address
 Var port = Server.address().port
 console.log("Example app listening at http://%s.%s"
                                    host.port)
})
```



Open http://127.0.0.1:8000/ in your browser to see the result.



Express.js Request Object

Express.js Request and Response objects are the parameters of the callback function which is used in Express applications.

The express.js request object represents the HTTP request and has properties for the request query string, parameters, body, HTTP headers, and so on.

```
app.get('/', function(req,res){
    //--
})
```

Express.js Request Object Properties

The following table specifies some of the properties associated with request object.

1. **req.app**
   This is used to hold a reference to the instance of the express application that is using the middleware.

2. **req.baseurl**
   It specifies the URL path on which a router instance was mounted.

3. **req.body**
   It contains key-value pairs of data submitted in the request body. By default, it is undefined, and is populated when you use body-parsing middleware such as body-parser.

4. **req.cookies**

When We use cookie-parser middleware, this properties is an object that contains cookies sent by the request.

5. req.fresh
It specifies that the request is "fresh". it is the opposite of req.stale.

6. req.hostname
It contains the hostname from the "host" http header.

7. req.ip
It specifies the remote IP address of the request.

8. req.ips
When the trust proxy setting is true, this property contains an array of Ip address specified in the? X-forwarded-for? request header.

9. req.originalurl
This property is much like req.url; however, it retains the original request URL, allowing you to rewrite req.url freely for internal routing purposes.

10. req.params
An object containing properties mapped to the named route? parameters?. for example, if you have the route /user/:name, then the "name" property is available as req.params.name. This object defaulults to {}.

11. req.path
It contains the parth part of the request URL.

12. req.protocol
The request protocol string, "http" or "https" When requested with TLS.

13. req.query
An object containing a property for each query string parameter in the route.

14. req.route
The currently-matched route, a string.

15. req.secure
A Boolean that is true if a TLS connection is established.

16. req.signedCookies
When using cookie-parser middleware, this property contain signed cookies sent by the request, unsigned and ready for use.

17. req.stale
It indicates whether the request is "stale", and is the opposite of req.fresh.

18. req.subdomains
It represent an array of subdomains the domain name of the request.

19. req.xhr

A Boolean value that is true if the request's "x-requested-With" header field is "xmlhttprequest", indicating that the request was issued by a client library such as jquery.

Request Object Methods

Following is a list of Some generally used request object methods:

req.accepts(types)

This method is used to check whether the specified Content types are acceptable, based on the request's Accept HTTP header field.

Examples:

```
req.accepts('html');
//=>?html?
req.accepts('text/html');
//=>?Text/html?
```

req.get(field)

This method returns the specified HTTP request header field.

Examples:

```
req.get('Content-Type');
//=> "text/plain"
req.get('content-type');
//=> "text/plain"
req.get('Something');
//=> undefined
```

req.is(type)

This method returns true if the incoming request's "Content-Type" HTTP header field matches the MIME type specified by the type parameter.

Examples:

```
// With Content-Type: text/html; charset=utf-8
req.is('html');
req.is('text/html');
req.is('text/*');
// => true
```

req.param(name[, defaultValue])

This method is used to fetch the value of param name when present.

Examples:

```
// ?name=Sasha
req.param('name')
// => "Sasha"
// POST name=sasha
req.param('name')
// => "Sasha"
// /user/sasha for /user/:name
req.param('name')
// => "Sasha"
```

Express.js Response Object

The Response object (res) specifies the HTTP response which is sent by an Express app when it gets an HTTP request.

What it does

- It sends response back to the Client browser.
- It facilitates you to put new cookies value and that will write to the client browser (under cross domain rule).
- Once you res.send() or res.direct() or res.render(). you cannot do it again. otherwise, there will be uncaught error.

Response Object Properties

Let's see some properties of response object:

1. res.app
It holds a reference to the instance of the express application that is using the middleware.

2. res.headersSent
It is a Boolean property that indicates if the app sent HTTP headers for the response.

3. res.locals
It specifies an object that contains response local variables scoped to the request.

Response Object Methods

Following are some methods:

Response Append method

res.append(field[,value])

This method appends the specified value to the HTTP response header field. That means if the specified value is not appropriate then this method redress that.

Examples:

```
res.append ('Link', [<http://localhost/>', '<http://
                    localhost:3000/>']);
res.append ('Warning', '199 Miscellaleneous Warning');
```

Response Attachment method

res.attachment([filename])

This method facilitates you to send a file as an attachment in the HTTP response.

Examples:

```
res.attachment ('path/to/js_pic.png');
```

Response Cookie method

res.cookie (name, value [, options])

This method is used to set a cookie name of value. The value can be string or object converted to JSON.

Examples:

```
res.cookie('name', 'Aryan', {domain: 'xyz.com', path:
                    '/admin, secure: true});
res.cookie ('Section', {Names: [Aryan, Sushil, Priyanka]});
res.cookie ('Cart', {items: [1,2,3]}, {maxAge: 900000});
```

Response Clearcookie method

res.clearCookie (name[, options])

As the name specifies, the clearCookie method is used to clear the cookie specified by name.

Examples:

To set a cookie

```
res.cookie('name', 'Aryan' {path: '/admin'});
```

To clear a cookie

```
res.clearCookie('name', {path: '/admin'});
```

Response Download method

res.download(path[, Filename][, fn])

this method transfers the file at path as an "attachment" and enforces the browser to prompt user for download.

Example:

```
res.download('/report-12345.pdf');
```

Response End method

res.end([data][, encoding])

This method is used to end the response process

Example:

```
res.end();
res.status(404).end();
```

Response Format method

res.format(Object)

This method performs content negotitation on the Accept HTTP header on the request object, When present.

Example:

```
res.format({
  'text/plain': function(){
    res.send('hey');
  },
  'text/html': function(){
    res.send('
hey');
  },
  'application/json': function(){
    res.send({message: 'hey'});
  },
  'default': function(){
    // log the request and respond with 406
    res.status(406).send('Not Acceptable');
  }
});
```

Response Get method

res.get(field)

This method provides HTTP response header specified by field.

Example:

```
res.get('Content-Type');
```

Response JSON method:

res.json([body])

This method returns the response in JSON format.

Example:

```
res.json(null)
res.json({name:'ajeet'})
```

Response JSONP method

res.jsonp([body])

This method returns response in JSON format with JSONP support.

Examples:

```
res.jsonp(null)
res.jsonp({name:'ajeet'})
```

Response Links method

res.links(links)

This method populates the response's Link HTTP header field by joining the links provided as properities of the parameter.

Examples:

```
res.links({
    next: 'http://api.rnd.com/users?page=5',
    last: 'http://api.rnd.com/users?page=10',
});
```

Response Location method

res.location(path)

This method is used to set the response location HTTP header field based on the specified path parameter.

Examples:

```
res.location('http://xyz.com');
```

Response Redirect method

res.redirect([status,] path)

This method redirects to the URL derived from the specified path. With specified HTTP status.

Examples:

```
res.redirect('http://example.com');
```

Response Render method

res.render(view [,locals][,callback])

This method renders a view and sends the rendered HTML string to the client.

Examples:

```
//send the rendered view to the client
res.render('index');
//pass a local variable to the view
res.render('user', {name:'aryan'}, function(err, html){
//...
});
```

Response Send method

res.send([body])

This method is used to send HTTP response.

Examples:

```
res.send(new Buffer('whoop'));
res.send({ some: 'json' });
res.send('
  ....some html
');
```

Response sendFile method

res.sendFile(path[, options][, fn])

This method is used to transfer the file at the given path. It sets the Content-Type response HTTP header field based on the filename's extension.

Examples:

```
res.sendFile(fileName, options, function(err){
  //...
});
```

Response Set method

res.set(field[, value])

This method is used to set the response of HTTP header field to value.

Examples:

```
res.set('Content-Type', 'text/plain');
res.set({
  'Content-Type': 'text/plain',
  'Content-Length': '123',
})
```

Response Status method

res.status(code)

This method sets an HTTP status for the response.

Examples:

```
res.status(403).end();
res.status(400).Send('Bad Request');
```

Response Type method

res.type(type)

This method sets the content-type HTTP header to the MIME type.

Examples:

```
res.type('.html');          // => 'text/html'
res.type('html');           // => 'text/html'
res.type('.json');          // => 'application/json'
res.type('application/json'); // => 'application/json'
res.type('.png');           // => image/png:
```

Express.js GET Request

GET and POST both are two common HTTP requests used for building REST API's GET requests are used to send only limited amount of data because data is sent into header While POST requests are used to send large amount of data because data is sent in the body.

Express.js facilitates you to handle GET and

POST request Using the instance of express.

Express.js GET Method Example 1

Fetch data in JSON format
Get method facilitates you to send only limited amount of data because data is sent in the header. It is not secure because data is visible in URL bar.
Let's take an example to demonstrate GET method

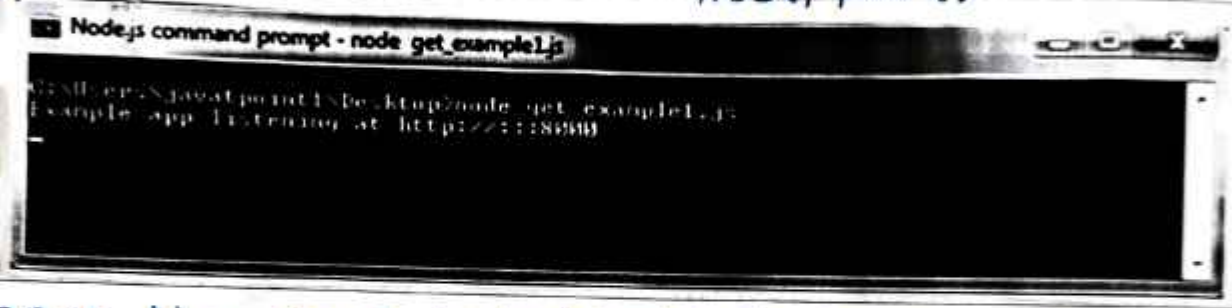
File: index.html

```
<html>
<body>
<from action="http://127.0.0.1:8081/process_get" method="GET">
First Name: <input type="text" name="first_name"><br>
Last Name: <input type="text" name="last_name">
<input type="submit" value="Submit">
</form>
</body>
</html>
```

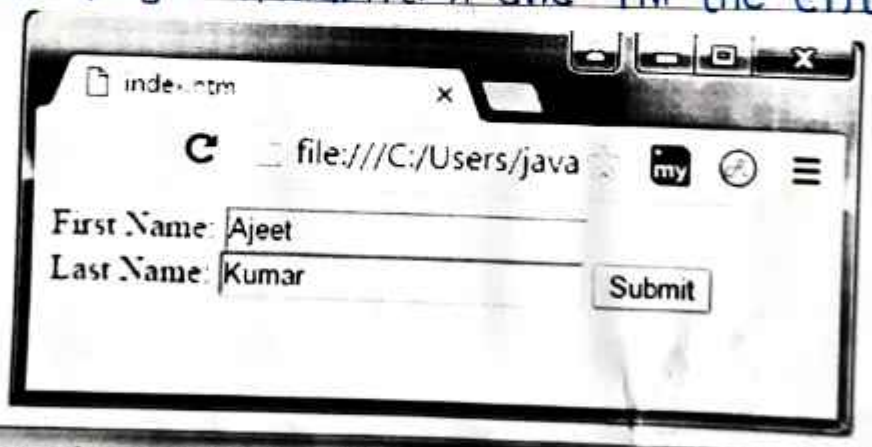
file: get_example.1.js

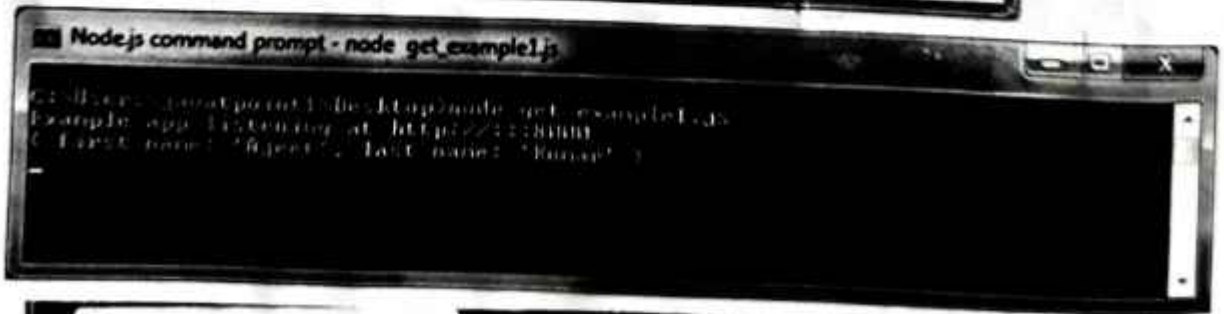
```
Var express = require('express');
Var app = express();
app.use(express.static('public'));
app.get('/index.html', function(req, res) {
  res.sendFile(__dirname + "/" + "index.html");
})
app.get('/process_get', function (req, res) {
response = {
   first_name: req.query.first_name,
```

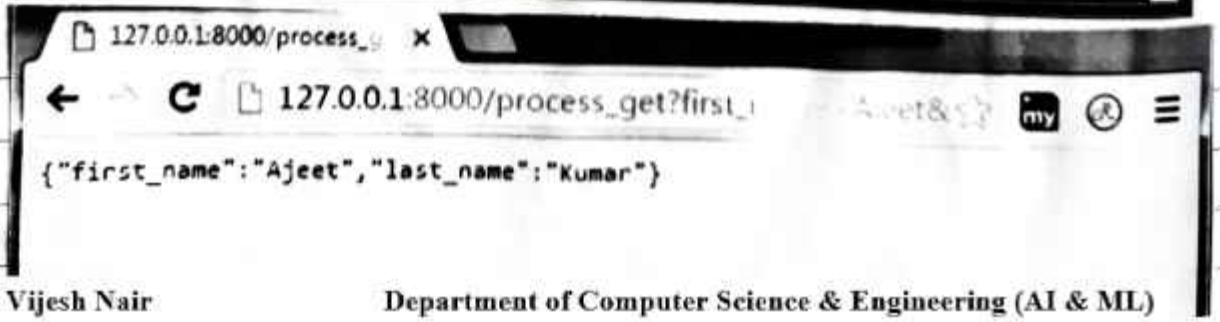
```
    last_name: req.query.last_name
});
    console.log(response);
    res.end(JSON.stringify(response));
})
var server = app.listen(8000, function(){
    var host = server.address().address
    var port = server.address().port
    console.log("Example app listening at http://%s,%s",
                                        host, port)
```



open the page index.html and fill the enteries







Express.js GET Method Example 2

Fetch data in paragraph format

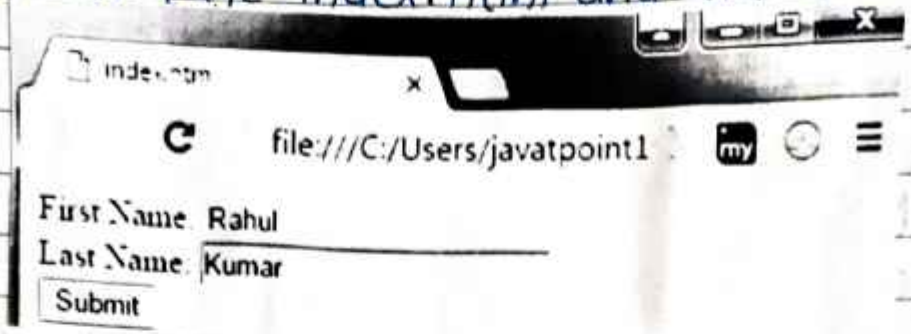
File: index.html

```
<html>
<body>
<form action="http://127.0.0.1:8000/get_example2"
                                    method="GET">
First name:<input type="text" name = "first_name"
                                    /><br/>
Last name:<input type="text" name = "last_name"/><br/>
<input type = "Submit" value = "submit"/>
</form>
</body>
</html>
```

File: get_example2.js

```
var express = require ('express');
Var app = express();
app.get ('/get_example2', function(req, res) {
 res.send('<p> Username:
 <p>Lastname: ' +req.query['last_name']+'</p>');
})
Varserver = app.listen(8000, function() {
 Var host = Server.address().address
 Var port = Server.address().port
 Console.log ("Example app listening at http://%s, %s.
                                    host, port)
})
```

open the page index.html and fill the entries:



output:

Express.js GET Method Example 3

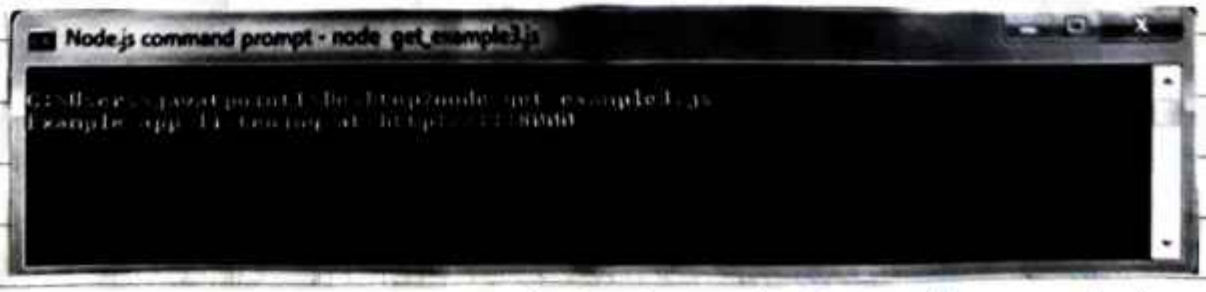
File: index.html

```
<!DOCTYPE html>
<html>
<body>
<form action="http://127.0.0.1:8000/get_example3">
<table>
<tr><td>Enter First Name:</td><td><input
  type="text" name="firstname"/><td></tr>
<tr><td>Enter Last Name:</td><td><input type
  "text" name = "lastname"/><td></tr>
<tr><td>Enter Password:</td><td><input type=
  "password" name = "password"/></td></tr>
<tr><td> Sex: </td><td>
<input type = "radio" name = "sex" value = "male">Ma
<input type = "radio" name = "sex" Value = "female">Fema
</td></tr>
<tr><td> About You: </td><td>
```

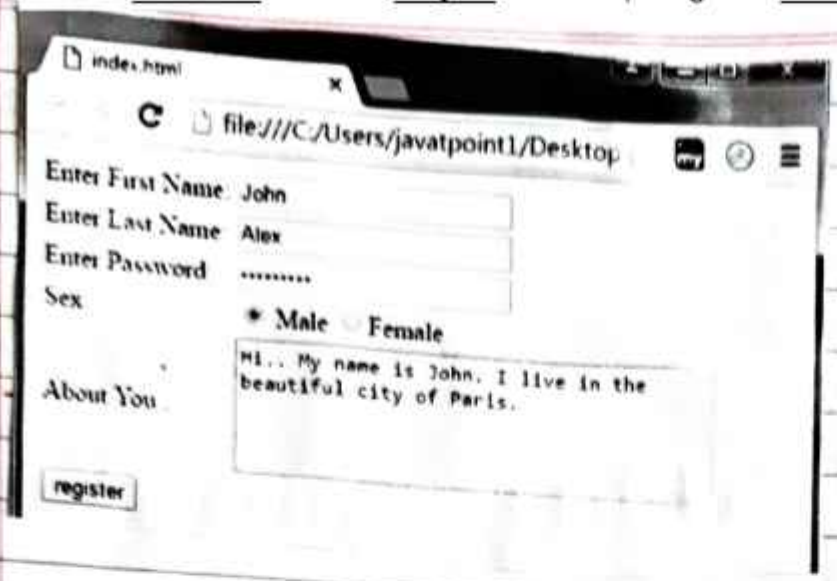
```
<textarea rows = "5" cols = "40" name = "aboutyou"
        placeholder = "Write about yourself ">
</textarea>
</td></tr>
<tr><td colspan = "2"><input type = "submit"
            value = "register"/br/></td><tr>
</table>
</form>
</body>
</html>
```

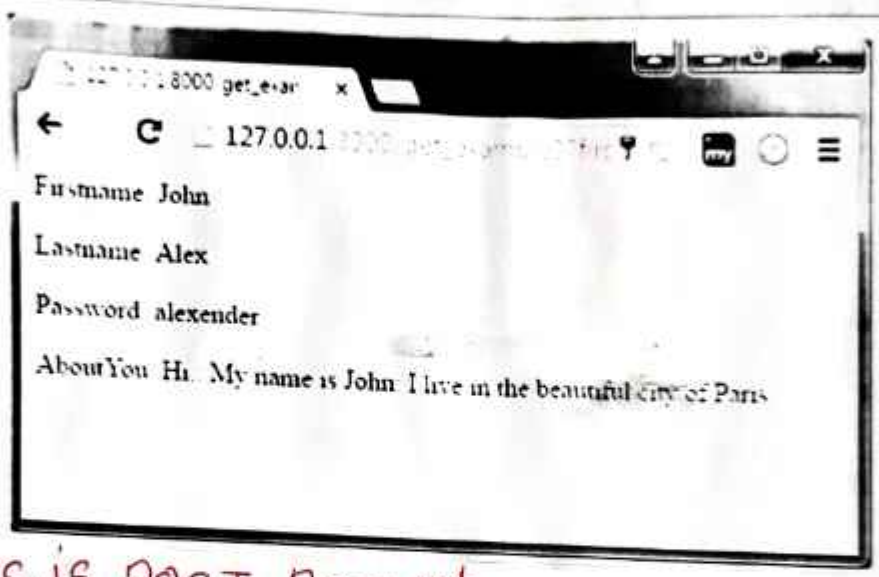
File : get_example3.js

```
var express = require('express');
varapp = express();
app.get('/get_example3' function(req,res){
res.send('<p>Firstname:' + req.query['firstname']+'</p>
<p>Lastname:'+ req.query['lastname']+ </p> <p>password
        :'+ req.query['password'] + '<p>
<p>AboutYou :'+ req.query['aboutyou'] + '</p>');
3)
var server = app.listen(8000, function(){
  varhost = Server.address().address
  varport = Server.address().port
  Console.log("Example app listening at http://%s.%s,
                        host,port)
3)
```



Open the page index.html and fill the entries:





Express.js POST Request

GET and POST both are two common HTTP requests used for building REST API's. POST requests are used to send large amount of data.
Express.js facilitates you to handle GET and POST requests using the instance of express.

Express.js POST Method

Post method facilitates you to send large amount of data because data is send in the body. Post method is secure because data is not visible in URL bar but is not used as popularly as GET method. On the other hand GET method is more efficient and used more than POST.

Let's take an example to demonstrate POST method

Example - 1

Fetch data in JSON format

File: Index.html

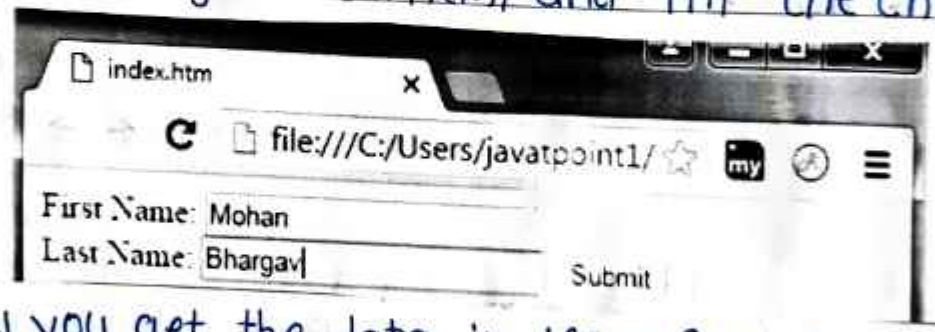
```
<html>
<body>
<form action = "http://127.0.0.1:8000/process_post"
                    method = "POST">
First Name: <input type = "text" name = "first_name"><br>
Last Name : <input type = "text" name = "last_name">
 <input type = "Submit" value = "Submit">
  </form>
  </body>
  </html>
```

File: post_example1.js

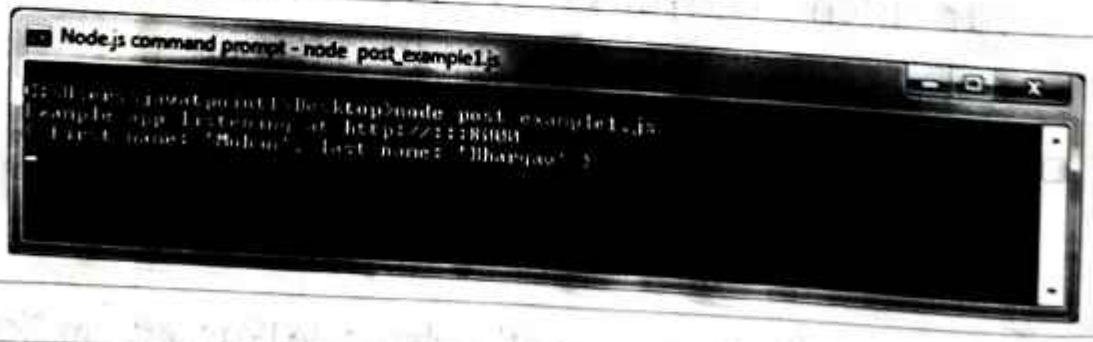
```
Var express = require('express');
Var app = epxress();
Var bodyParser = require('body-parser');
//Create application/x-WWW-form-urlencoded parser
Var urlencodedParser = bodyParser.urlencoded
                    ({extended: false})
app.use(express.static('public'));
app.get('/index.html', function(req,res){
   res.sendFile(__dirname+"/"+"index.html");
})
app.post('/process_post', urlencodedParser, function(req,res){
  //Prepare output in JSON format
response = {
   first_name:req.body.first_name,
   last_name:req.body.last_name
};
```

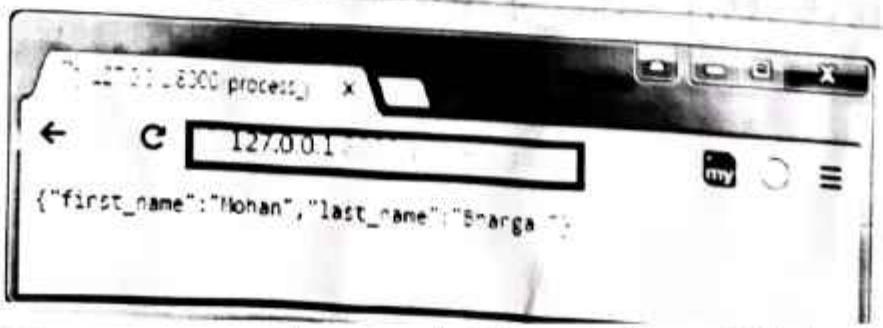
```
    Console.log(response);
    res.end(JSON.stringify(response));
})

var server = app.listen(8000, function() {
    var host = server.address().address
    var port = server.address().port
    console.log("Example app listening at http://%s:%s", host, port
})
```

Open the page index.html and fill the entries:



Now, you get the data in JSON format.





Express.js Routing

Routing is made from the word route. It is used to determine the specific behavior of an application. It specifies how an application responds a client request to a particular route, URI or path and a specific HTTP request method (GET, POST etc). It can handle different types of HTTP requests.
Let's take an example to see basic routing.
File: routing_example.js

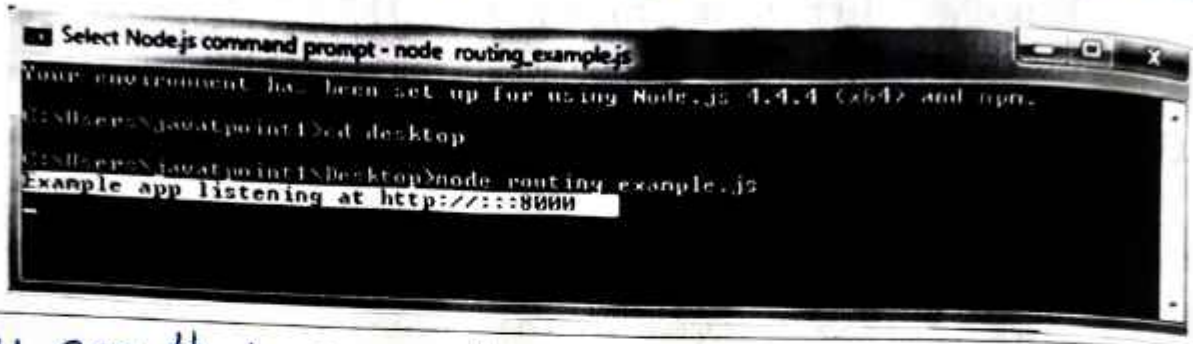
```
Var express = require ('express');
Var express = require('express');
Var app = express();
app.get('/', function (req, res){
    Console.log ("Got a GET request for the homepage");
    res.send('Welcome to JavaTpoint!');
})
app.post('/', function(req, res){
    console.log('Got a POST request for the homepage');
    res.send('I am Impossible');
})
app.delete('/del_student', function(req, res){
    Console.log("Got a DELETE request for /del_student");
    res.send('I am deleted!');
})
app.get('/enrolled_student', function(req, res){
    Console.log('Got a GET requests for/enrolled_student');
    res.send('I am an enrolled student.');
})
//This responds a GET requests for abcd, abxcd, ab123cd, and so on
app.get('/ab*cd', function(req, res){
    Console.log("GOT a GET request for /ab*cd");
```

```
    res.send('Pattern Matched');
});
```

3)

```
var server = app.listen(8000, function() {
  var host = server.address().address
  var port = server.address().port
  console.log("Example app listening at http://%s:%s", host, port)
});
```

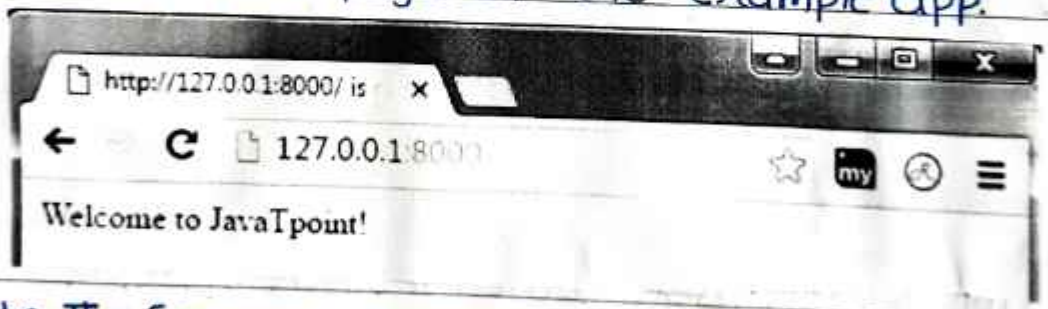
3.)



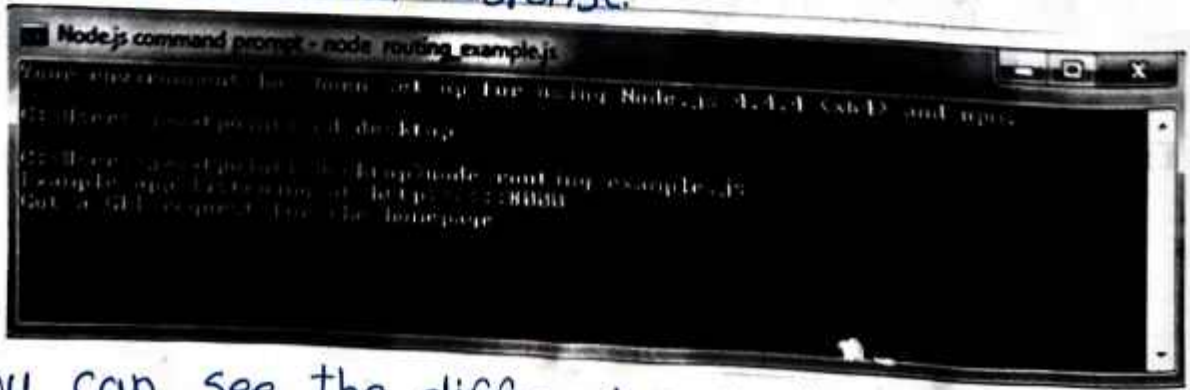
You see that server is listening.
Now, you can see the result generted by server on the local host http/127.0.0.1:8000

Output:

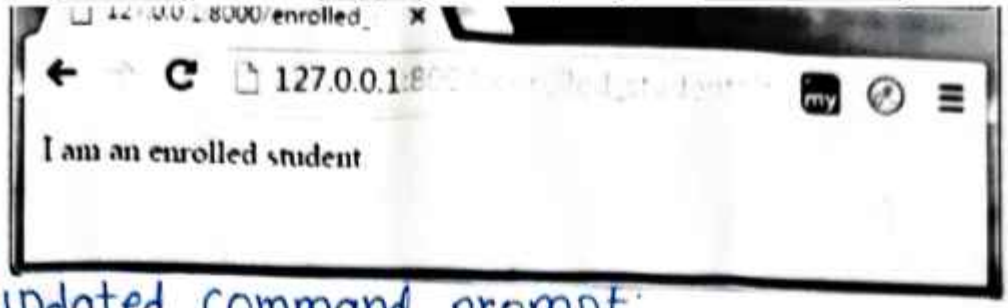
This is the homepage of the example app.



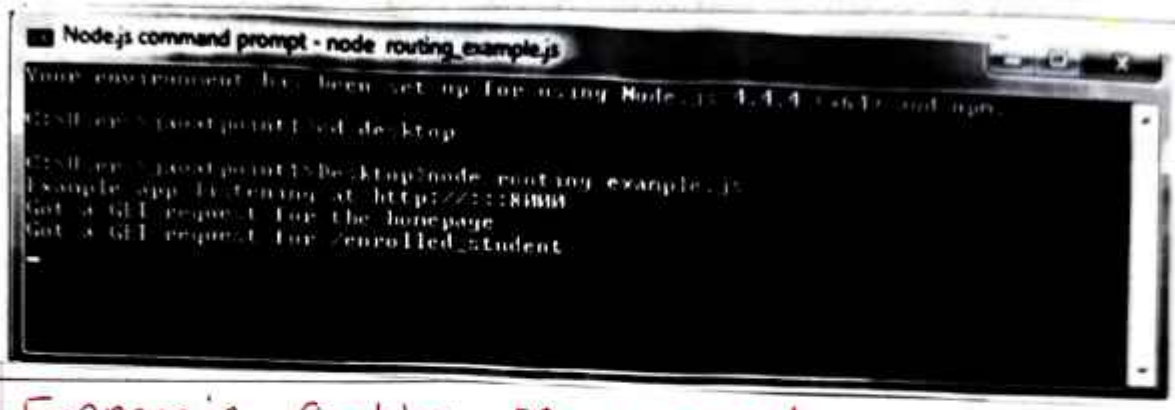
Note: The Command Prompt will be updated after one sucessful response.



You can see the different pages by changing rutes:
http://127.0.0.1:8000/enrolled_student



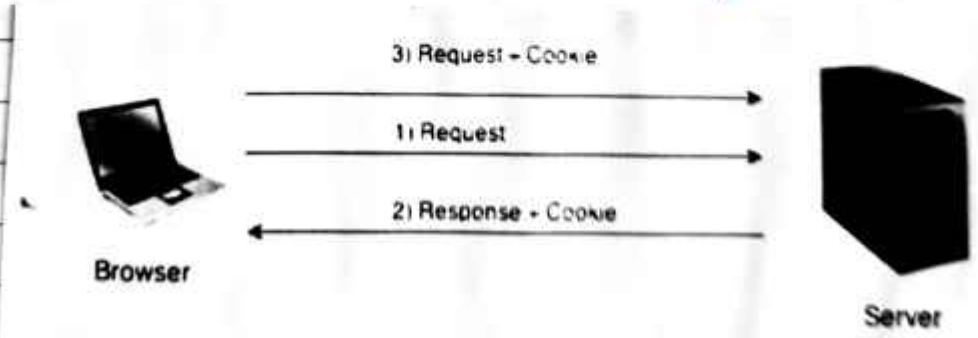
Updated command prompt:



Express.js Cookies Management

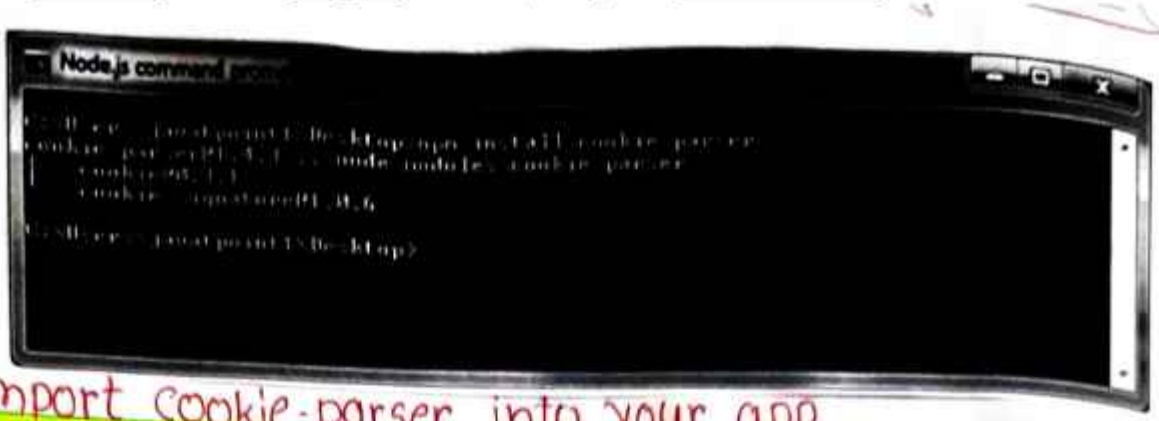
What are Cookies

Cookies are small piece of information i.e. sent from a Website and stored in user's Web browser when user browser that Website. Every time the user loads that Website back, the browser sends that stored data back to Website or Server. to recognize user.



Install cookie

You have to acquire Cookies abilities in Express.js. So, install Cookie-parser middle ware through npm by using the following command:



Import cookie-parser into your app.

```
Var express = require ('express');
Var CookieParser = require ('cookie-parser');
Var app = express();
app.use (cookie Parser());
```

Define a route:

Cookie-parser parses Cookie header and populate req.cookies with an object keyed by the cookie names. Let's define a new route in your express app like set a new cookie:

```
app.get ('/cookie', function(req, res) {
    res.cookie('cookie_name', 'cookie_value').send('Cookie is set');
});
app.get ('/', function(req, res) {
    console.log ("Cookies: ", req.cookies);
});
```

Browser sends back that cookie to the server, every time When it requests that website.

Express.js Cookies Example

File: Cookies_example.js

```
Var express = require('express');
Var Cookie Parser = require ('Cookie-parser');
Var app = express();
app.use (cookie Parser());
```

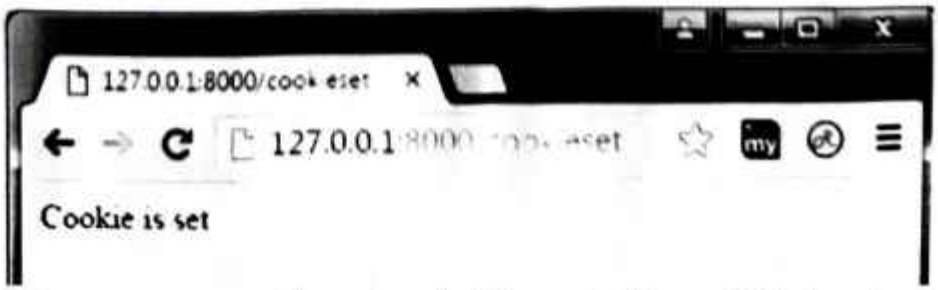
```
app.get('/cookieset', function(req,res){
res.cookie('cookie_name', 'cookie_value');
 res.cookie('company', javatpoint');
 res.cookie('name', 'sonoo');
 res.status(200).send('cookie is set');
});
 app.get('/', function(req, res ) {
  res.status(200).send('Welcome to JavaTpoint');
});
  var server = app.listen(8000, function() {
    var host = server.address().address;
    var port = server.address().port;
    console.log('Example applistening athttp://%s.%s', host.port);
});
```

Output:

Open the page http://127.0.0.1:8000/ on your browser.

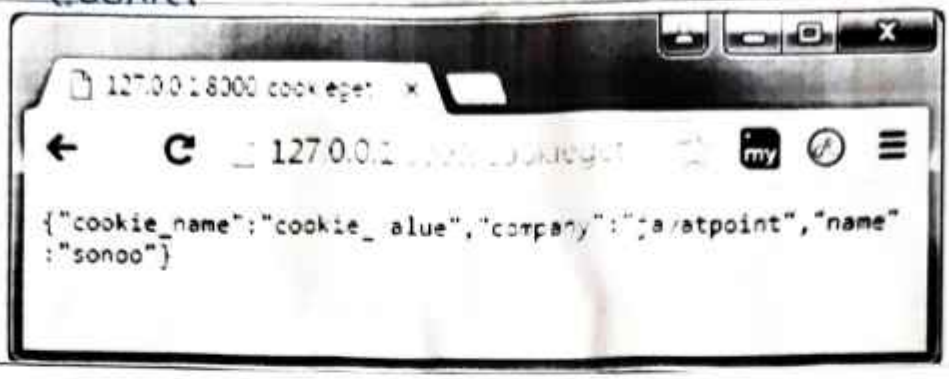
Set cookie:

Now open http://127.0.0.1:8000/cookieset to the set cookie:



Get Cookie:

Now open http://127.0.0.1:8000/cookieget to get the Cookie:



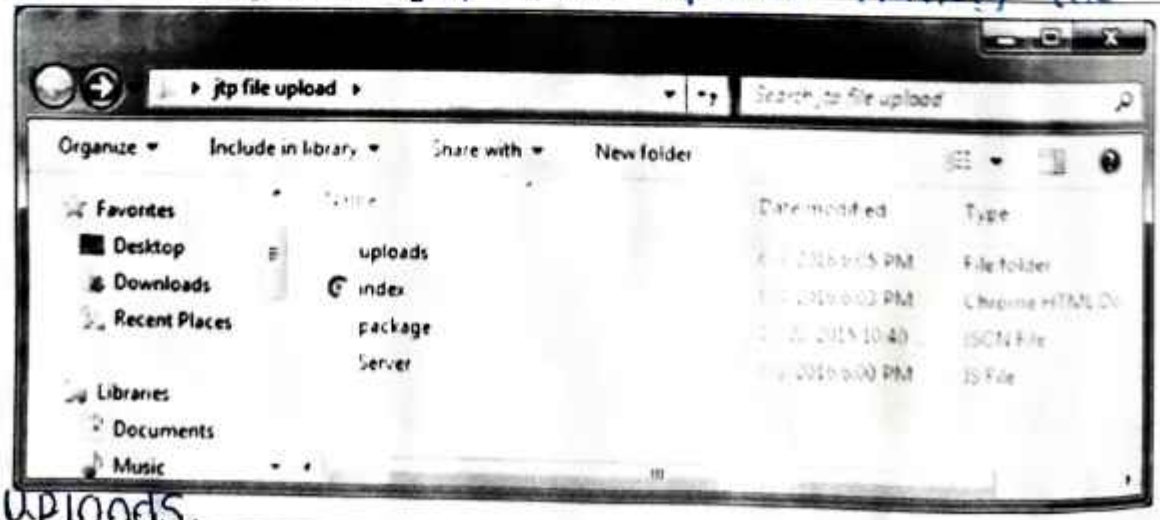
Express.js File Upload

In Express.js, file upload is slightly difficult because of its asynchronous nature and networking approach.

It can be done by using middleware to handle multipart/form data. There are many middleware that can be used like multer, connect.body-parser etc.

Lake take an example to demonstrate file upload in Node.js. Here, we are using the middleware 'multer'.

Create a folder "jtp file upload" having the



uploads.

It is an empty folde i.e created to store the uploaded images.

Package:

It is JSON file, having the following data:

File: package.json

```
{
 "name": "file_upload",
 "version": "0.0.1",
 "dependencies": {
   "express": "4.13.3",
   "multer": "1.1.0"
 },
 "devDependencies": {
   "Should": "~7.1.0",
   "mocha": "~2.3.3",
   "supertest": "~1.1.0"
  }
}
```

File: index.html

```
<html>
 <head>
  <title>File upload in Node.js by Javatpoint</title>
<script src = "http://ajax.googleapis.com/ajax/libs/jquery/1.11/
              jqury.min.js"></script>
<script src = "http://cdnjs.cloudfare.com/ajax/libs/jquery.
              form/3.51/jquery.form.min.js"><script>
<Script>
$(document).ready(function(){
  $('#uploadForm').submit(function(){
    $("#status").empty().text("File is uploading...");
  $(this).ajaxSubmit({
    error: function(xhr){
```

```
        Status('Error:' + xhr.status);
      },
      Sucess : function(response) {
            Console.log (response)
            $("#status").empty().text(response);
      }
  });
   return false;
   });
});
  </script>
  </head>
  <body>
     <h1>Express.js File upload: by Javatpoint </h1>
                        <form    id = "uploadform"
data action = "/uploadjavatpoint" method = "post" >
  <input type = "file" name = "mylife" /><br/><br/>
  <input type = "Submit" value = "Upload Image"
        name = "submit" ><br/><br/>
  <span id = "status" ></span>
  </form>
 </body>
</html>
```

File: server.js

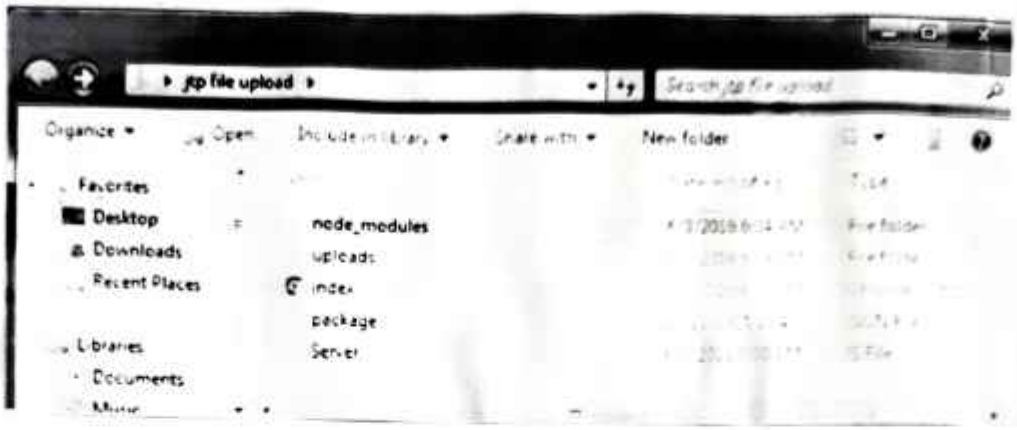
```
var express = require("express");
var multer = require('multer');
var app = express();
var storage = multer.diskStorage({
  destination: function(req, file, callback) {
    callback (null, './uploads');
  },
```

```
filename : function(req, file, callback ){
    callback (null, file.originalname);
  }
});
var upload = multer({storage:Storage}).single('myfile');
 app.get ('/', function (req, res){
      res.SendFile(_dirname + "/index.html");
});
app.post ('/uploadingjavatpoint,function(req,res){
    upload(req,res,function(err){
      if(err){
        return res.end("Error uploading file");
      }
      res.send("File is uploaded sucessfully!");
    });
});
app.listen(2000, function(){
   Console.log('server is running on port 2000");
});
```

To install the package.json, execute the following code:

```
npm install
```

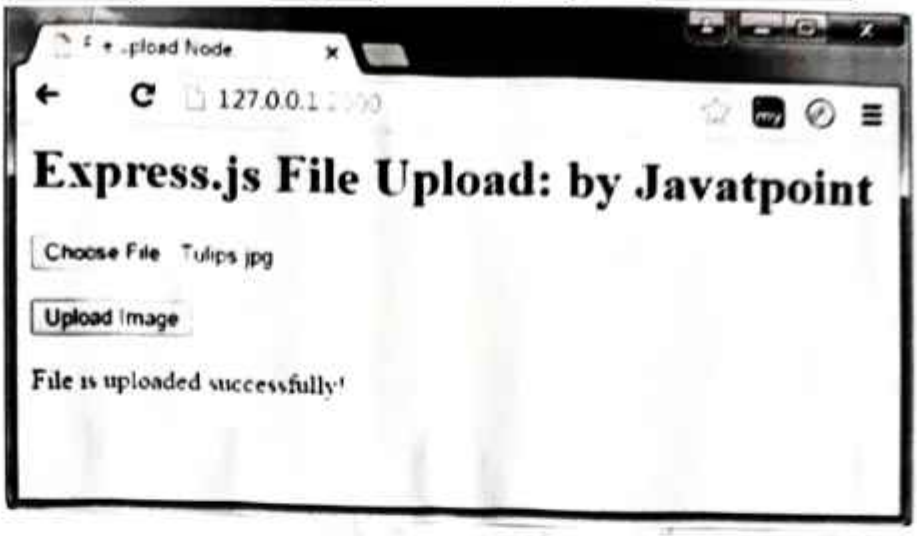
It Will create a new folder "node_modules" inside the "jtp file upload" folder.



Dependencies are installed. Now, run the server:
node server.js

Open the local page http://127.0.0.1:2000/ to upload the images.

Select an image to upload and click on "Upload Image" button.



Here, you see that file is uploaded sucessfully. You can see uploaded file in the 'Uploads' folder.

Express.js Middleware

Express.js Middleware are different types of functions that are invoked by the Express.js routing layer before the final request handler. As the name specified, middleware appears in the middle between an initial request and final intended route. In stack, middleware functions are always invoked in the order in which they are added.

Middleware is commonly used to perform tasks like body parsing for URL-encoded or JSON requests, Cookie parsing for basic cookie handling, or even

building JavaScript modules on the fly.

What is a Middleware function

Middleware function are the functions that access to the request and response object (req,res) in regrest- response cycle.
A middleware function can perform the following tasks:

- It can execute any code.
- It can make changes to the request and the response objects.
- It can end the request- response only cycle.
- It can all the next middleware function in the stack.

Express js Middleware

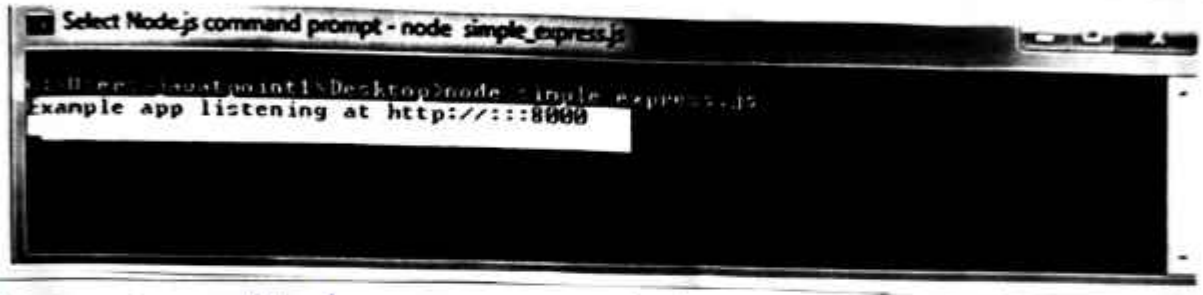
Following is a list of possibly used middleware in Express.js app:

- Application - level middleware.
- Router - level middleware
- Error - handling middleware
- Built-in - middleware
- Third-party middleware

Let's take an example to understand what middleware is and how it works.
Let's take the most basic Express.js app:
File: simple_express.js

```
Var express = require ('express');
Var app   = express();
app.get('/', function (req ,res) {
    res.send ('Welcome to JavaTpoint');
```

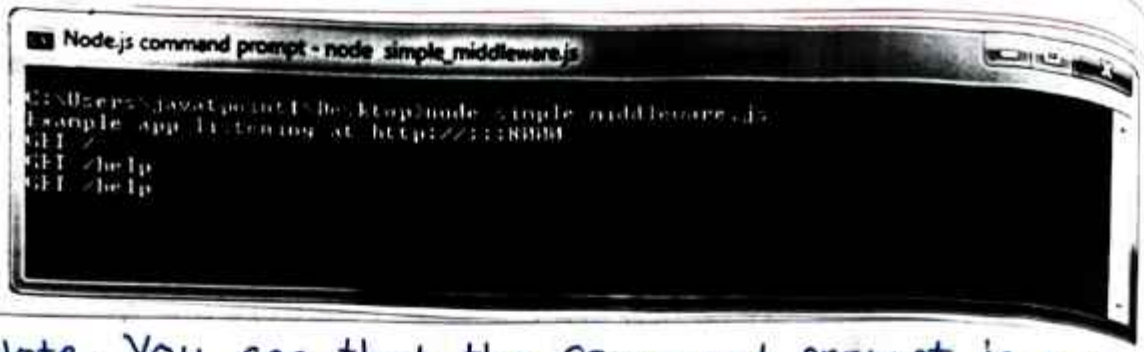
```
});
app.get('/help', function (req, res) {
   res.send('How can I help you?');
});
 Var Server = app.listen(8000, function() {
   Var host= Server.address().address
   Var port = Server.address().port
 Console.log("Example app listening at http:%s.%s", host.port)
})
```



You see that server is listening.
Now, you can see the result generated by server on the local host http://127.0.0.1:8000

Output:

Let's see the next page: http://127.0.0.1:8000/help
Output:



Note: You see that the command prompt is not changed. Means, it is not showing any record of the GET request although a GET request is processed in the http://127.0.0.1:8000/help page.

Use of Express.js Middleware

If you want to record every time you a get a request then you can use a middleware.

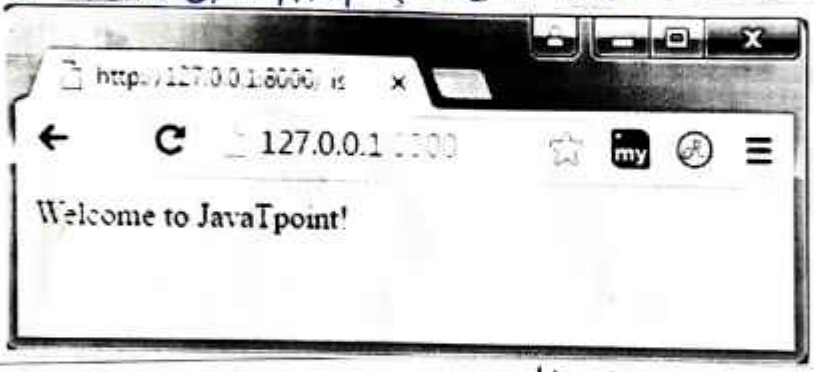
File: Simple_middleware.js

```
Var express = require ('express')
Var app = express();
 app.use(function(req,res,next){
   Console.log('%s %s', req.method, req.url);
   next();
 });
 app.get('/', function(req,res,next){
    res.send('Welcome to JavaTpoint');
 });
 app.get('/help', function(req,res,next){
    res.send("How can I help you?");
 });
 Var server = app.listen(8000, function(){
  Var host = server.address().address
  Var port = server.address().port
  Console.log("Example app listening at http://%s:%s
                        host, port)
 })
```

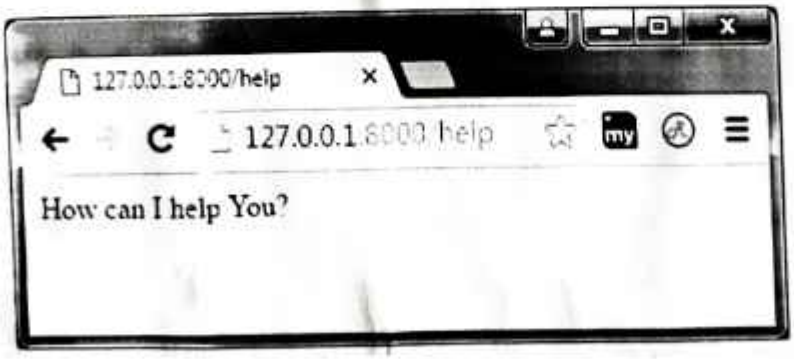
You see that server is listening.
Now, you can see the result generated by server on the local host http://127.0.0.1:8000

Output:

You can see that output is same but command prompt is displaying a GET result.



GO to http://127.0.0.1:8000/help



As many times as you reload the page, the command prompt will be updated.

Note: In the above example next() middleware is used.

Middleware example explanation

- In the above middleware example a new function is used to invoke with every request via app.use().
- Middleware is a function, just like route handlers and invoked also in the similar manner.
- You can add more middlewares above or below using the same API.

Express.js Scaffolding

What is scaffolding

Scaffolding is a technique that is supported by some MVC frameworks.
It is mainly supported by the following frameworks: Ruby On Rails, outSystem Platform, Express Framework, play framework, Django, monoRail, Brail, Symfony, Laravel, Codelgniter, Yii, Cake PHP, Phalcon PHP, Model-Glue, PRADO, Grails, Catalyst, Seam Framework, Spring ROO, ASP.NET etc.
Scaffolding facilitates the programmers to specify

how the application data may be used. This specification is used by the frameworks with predefined code templates, to generate the final code that the application can use for CRUD operations (create, read, update and delete database entries).

Express.js Scaffold

An Express.js Scaffold supports Candy and more Web projects based on Node.js.

Install Scaffold

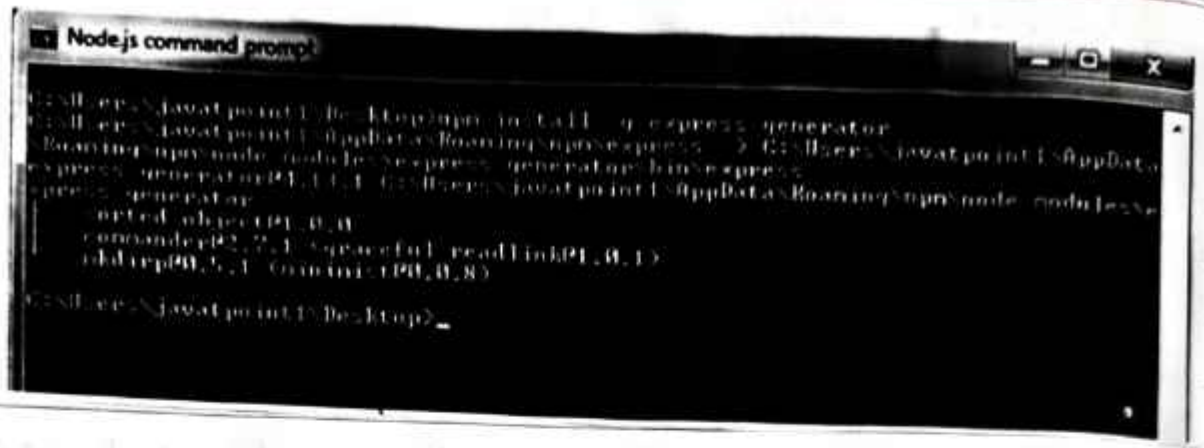
Execute the following command to install Scaffold.

```
npm install express-scaffold
```

It will take a few seconds and the screen will look like this:

After this step, execute the following command to install express generator:

```
npm install -g express-generator
```



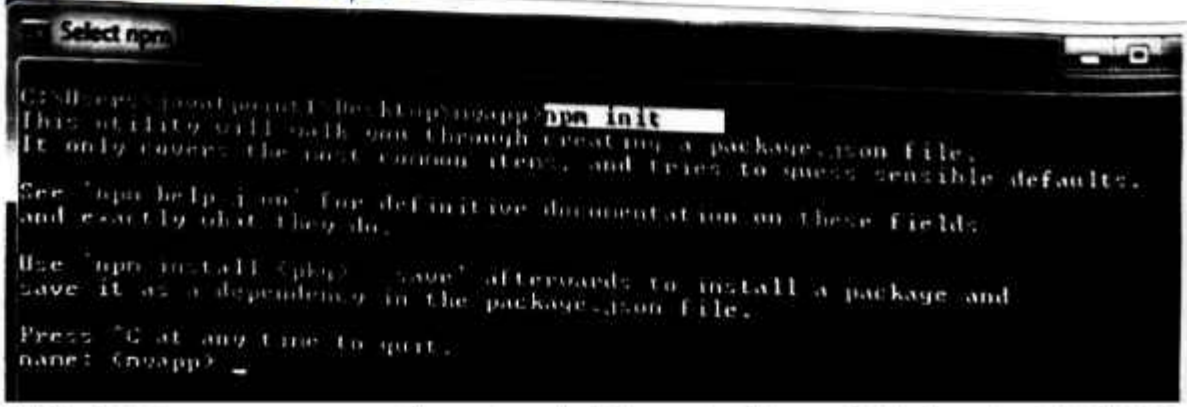
Now, you can use express to scaffold a Web-app.

Let's take an example:

First create a directory named myapp. Create a file named app.js in the myapp directory having the following code:

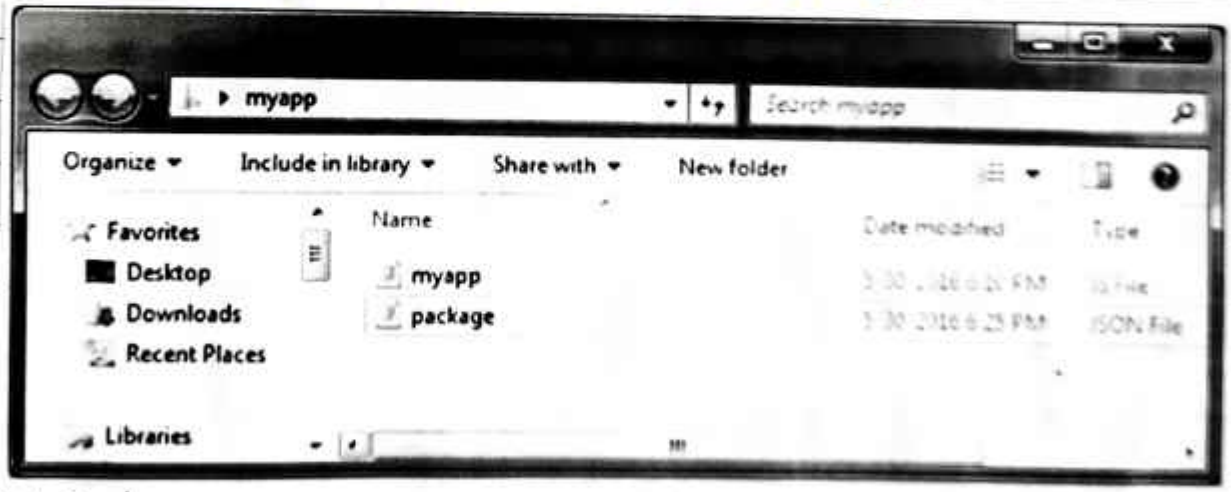
```
Var express = require ('express');
Var app = express();
app.get('/', function(req, res){
   res.send('Welcome to JavaTpoint');
});
app.listen (8000, function(){
   Console.log('Example app listening on port 8000!');
});
```

Open Node.js Command prompt. go to myapp and run npm init command (In my case, I have created myapp folder on desktop)

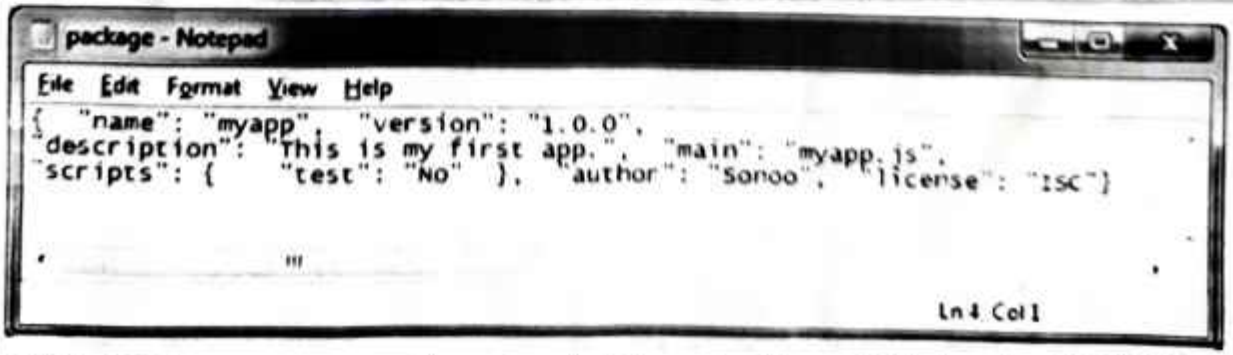


Fill the entries and press enter.

It will create a package.json file in myapp folder and the data is shown in JSON format.



Output:



Using template engines With express

Template engine makes you able to use static template file in your application. To render template files you have to set the following application setting properties:

- Views:
  It specifies a directory where the template files are located.
  for example, app.set('views', './views').
- View engine:
  It specifies the template engine that you use. For example, to use the Pug template engine: app.set ('view engine', 'pug').

Let's take a template engine pug (formerly known as jade).

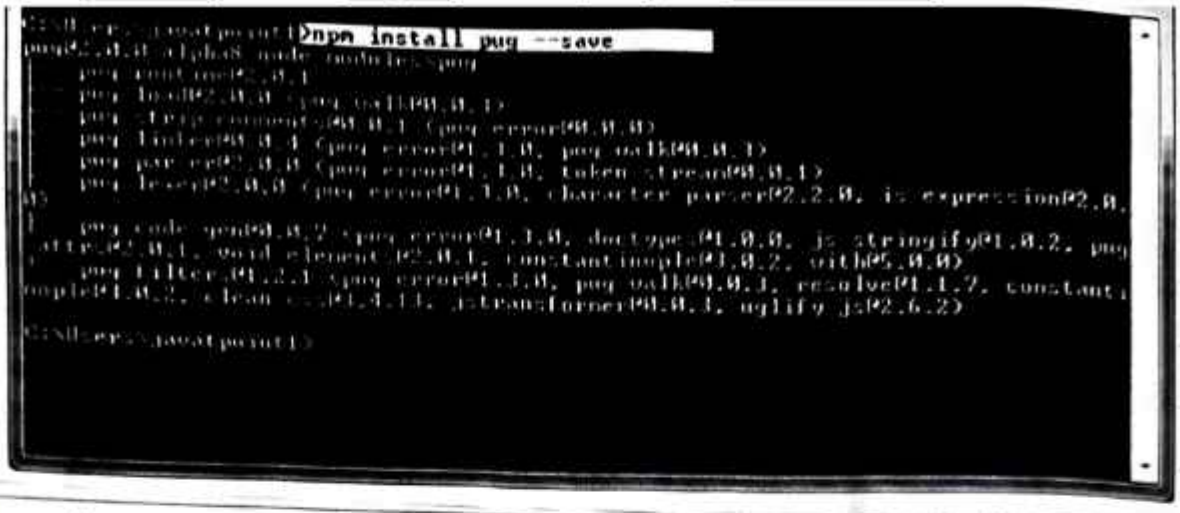
Pug Template Engine

Let's learn how to use pug template engine in Node.js application using Express.js. Pug is a template engine for Node.js. Pug uses Whitespaces and indentation as the part of the syntax. It syntax is easy to learn.

Install pug

Execute the following command to install pug template engine:

```
npm install pug -- save
```



Pug template must be written inside .pug file and all .pug files must be put inside views folder in the root folder of Node.js application.

Note: Be default Express.js searches all the views in the views folder under the root folder. You can also set to another folder using views property in express. For example: app.set ('views', 'myViews')

The pug template engine takes the input a simple way and produce the output in HTML. See how it renders HTML:

Simple input:

```
doctype html
html
  head
    title A simple pug example
  body
    h1 This page is produced by pug template engine
    p some paragraph here..
```

Output produced by pug template:

```
<!DOCTYPE html>
<html>
 <head>
  <title>A simple pug example</title>
 </head>
 <body>
  <h1>This page is produced by pug template engine
                                        </h1>
  <p>Some paragraph here..</p>
 </body>
 </html>
```

Express.js can be used with any template engine. Lets take an example to deploy how pug template creates HTML page dynamically.

See this example:

Create a file named index.pug file inside views folders and write the following pug template init:

```
doctype html
html
  head
    title a simple pug example
  body
    h1 this page is produced by pug template
       engine
    p some paragraph here...
```

File : Server.js

```
Var express = require ('express');
Var app = express();
 // set view engine
 app.set ("view engine", "pug")
 app.get ('/', function (req, res) {
 res.render ('view.pug', index);
  res.render ('index')
});
Var server = app.listen (5000, function() {
     Console.log ('Node server is running..');
});
```