ExpressJS

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Top 50 Interview Questions and Answers

With Code Snippets

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About the Tutorial Guide

Collection of ~50 ExpressJS Technical Interview Questions

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Covers all features and aspects of ExpressJS.

Detailed Explanations with Code Snippets

Entire Interview Questions covered in 2 Part series

- **ExpressJS Interview Questions Answers - Part 1** - This Tutorial
- ExpressJS Interview Questions Answers - Part 2

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1. **What is Express.js and why is it used?**

   Express.js is a fast and minimalist web application framework for Node.js.

   It is used to build web applications and APIs by providing a robust set of features and simplifying the development process.

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2. How do you install Express.js in a Node.js project?

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You can install Express.js using npm (Node Package Manager) by running the command:

npm install express.

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3. What are the key features of Express.js?

- **Routing**: Express provides a simple and flexible way to define routes and handle HTTP requests.
- **Middleware**: Express enables the use of middleware functions to perform tasks such as request/response processing, authentication, and error handling.
- **Template engines**: Express supports various template engines, allowing the dynamic generation of HTML markup.
- **Error handling**: Express provides middleware for handling errors and exceptions in a centralized manner.
- **Extensibility**: Express is highly extensible, allowing the use of additional libraries and middleware to enhance functionality.

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4. How does Express.js handle routing?

- Express uses the concept of routes to handle different HTTP methods (GET, POST, PUT, DELETE) and URLs.

- Routes are defined using the app.get(), app.post(), app.put(), app.delete() methods, among others.

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5. What is middleware in Express.js?

- Middleware functions are functions that have access to the request and response objects in Express.js.
- They can perform tasks such as logging, data parsing, authentication, and error handling.
- Middleware functions can be registered using app.use() or specific route methods.

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6. How can you handle form data in Express.js?

- Express provides the body-parser middleware for handling form data.
- You can use it by adding the following code to your Express application:


```
const express = require('express');
const bodyParser = require('body-parser');
const app = express();

// Parse JSON bodies
app.use(bodyParser.json());

// Parse URL-encoded bodies
app.use(bodyParser.urlencoded({ extended: false }));

// Route handler for POST request
app.post('/users', (req, res) => {
  const userData = req.body;
  // Process the user data as needed

  res.send('User created successfully');
});
```

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7. How can you handle static files (e.g., CSS, images) in Express.js?

- Express provides a built-in middleware called express.static to serve static files.
- You can use it by specifying the directory containing the static files:

```
const express = require('express');
const app = express();

// Serve static files from the "public" directory
app.use(express.static('public'));
```

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8. What is the purpose of the next() function in Express.js middleware?

- The next() function is used in middleware to pass control to the next middleware function in the stack.
- It is typically called at the end of a middleware function to hand off the request and response objects to the next middleware in line.


```
const express = require('express');
const app = express();

// Middleware function
const middleware = (req, res, next) => {
  console.log('Middleware function');
  // Perform some middleware logic here

  // Call next() to pass control to the next middleware or route handler
  next();
};

// Route handler
app.get('/users', middleware, (req, res) => {
  console.log('Route handler');
  res.send('List of users');
});
```

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9. How can you handle route parameters in Express.js?

- Express allows you to define route parameters by prefixing a colon (:) to a part of the route path.
- You can access the parameter value in the request handler using req.params.


```
const express = require('express');
const app = express();

// Route handler with route parameter
app.get('/users/:id', (req, res) => {
  const userId = req.params.id;
  res.send(`User ID: ${userId}`);
});
```

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10. How can you implement authentication in Express.js?

- Authentication can be implemented in Express.js using various strategies such as JSON Web Tokens (JWT), session-based authentication with cookies, or integrating with third-party authentication providers like OAuth.

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11. Explain the concept of middleware chaining in Express.js.

- Middleware chaining in Express.js involves registering multiple middleware functions in a specific order using app.use() or route-specific methods.

- Each middleware function is executed in sequence, and subsequent middleware functions can modify the request or response objects before passing control to the next middleware in the chain.

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12. How can you handle errors in Express.js?

- Express provides error-handling middleware functions that can be defined with four parameters (err, req, res, and next).
- We can throw Error and catch them in a try-catch exception.
- You can use these middleware functions to handle and process errors.

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13. What are route handlers in Express.js?

- Route handlers are functions responsible for handling requests to specific routes.
- They are defined as callbacks to HTTP method-specific route functions (e.g., app.get(), app.post()).


```
const express = require('express');
const app = express();

// Route handler for the root route ("/")
app.get('/', (req, res) => {
  res.send('Hello, World!');
});

// Route handler for the "/users" route
app.get('/users', (req, res) => {
  res.send('List of users');
});
```

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14. How can you access request query parameters in Express.js?

- Request query parameters can be accessed using req.query.
- For example, if the URL is http://example.com/search?q=express, you can access the value of q using req.query.q.


```
const express = require('express');
const app = express();

app.get('/search', (req, res) => {
  const searchTerm = req.query.q;
  const page = req.query.page || 1;

  // Perform search operation based on the searchTerm and page

  res.send(`Search Results for '${searchTerm}', Page: ${page}`);
});
```

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15. How can you send JSON responses in Express.js?

- You can send JSON responses in Express.js using the res.json() method.


```
const express = require('express');
const app = express();

app.get('/user', (req, res) => {
  const user = {
    id: 1,
    name: 'John Doe',
    email: 'john@example.com',
  };

  res.json(user);
});

app.listen(3000, () => {
  console.log('Server is running on port 3000');
});
```

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16. How can you handle file uploads in Express.js?

- You can handle file uploads in Express.js using middleware such as multer or formidable.
- These middleware handle multipart/form-data requests and provide convenient methods to access and save uploaded files.


```
const express = require('express');
const multer = require('multer');
const app = express();

// Configure multer middleware for file uploads
const storage = multer.diskStorage({
  destination: function (req, file, cb) {
    cb(null, 'uploads/');
  },
  filename: function (req, file, cb) {
    cb(null, file.originalname);
  },
});
const upload = multer({ storage: storage });

// Route handler for file upload
app.post('/upload', upload.single('file'), (req, res) => {
  if (req.file) {
    res.send('File uploaded successfully');
  } else {
    res.status(400).send('No file uploaded');
  }
```

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17. Explain the difference between app.get() and app.use() in Express.js.

- app.get() is a route-specific method in Express used for handling GET requests to a specific URL.

- app.use() is a more general-purpose method used for registering middleware functions that will be executed for every request, regardless of the HTTP method or path.

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18. How can you set response headers in Express.js?

- You can set response headers in Express.js using the res.set() method.


```
const express = require('express');
const app = express();

app.get('/', (req, res) => {
  res.setHeader('Content-Type', 'text/plain');
  res.setHeader('X-Custom-Header', 'Hello, world!');
  res.send('Response with custom headers');
});
```

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19. What is the purpose of the app.locals object in Express.js?

- The app.locals object in Express.js is an object that provides a way to pass data from the server to views or templates.
- It can be used to store variables or functions that are accessible within the application's rendering context.


```
const express = require('express');
const app = express();

// Set a local variable using app.locals
app.locals.title = 'My Express App';

// Access the local variable in a route
app.get('/', (req, res) => {
  res.send(`Title: ${app.locals.title}`);
});
```

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20. How can you implement session management in Express.js?

- Session management can be implemented in Express.js using middleware such as express-session.
- This middleware handles session creation, storage, and management, allowing you to store session-specific data across multiple requests.

```
const express = require('express');
const session = require('express-session');
const app = express();

// Configure session middleware
app.use(
  session({
    secret: 'your-secret-key',
    resave: false,
    saveUninitialized: false,
    cookie: { secure: false }, // Set to true if using HTTPS
  })
);
```

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21. How can you handle Cross-Origin Resource Sharing (CORS) in Express.js?

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- CORS can be handled in Express.js using middleware such as cors.
- This middleware adds appropriate headers to the response, allowing cross-origin requests from specified domains.

```
const express = require('express');
const cors = require('cors');
const app = express();

// Enable CORS middleware
app.use(cors());
```

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22. Explain the concept of route prefixing in Express.js.

- Route prefixing in Express.js involves grouping related routes under a common prefix.
- This can be achieved by using the app.use() method with a common path as the first argument, followed by the route-specific methods.


```
const express = require('express');
const app = express();

// Route prefixing
const apiRouter = express.Router();
app.use('/api', apiRouter);

// Routes under the '/api' prefix
apiRouter.get('/users', (req, res) => {
  res.send('List of users');
});
```

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23. How can you implement rate limiting in Express.js?

- Rate limiting can be implemented in Express.js using middleware such as express-rate-limit.
- This middleware restricts the number of requests from a specific IP address or user within a specified time frame.


```
const express = require('express');
const rateLimit = require('express-rate-limiter');

const app = express();

// Apply rate limiting middleware
app.use(
  rateLimit({
    windowMs: 60 * 1000, // 1 minute
    max: 10, // Maximum 10 requests per windowMs
    message: 'Too many requests, please try again later.',
  })
);
```

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24. What is the purpose of view engines in Express.js?

- View engines in Express.js allow for the dynamic generation of HTML or other types of markup.

- They help in rendering templates and injecting data into them before sending the response to the client.

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25. How can you implement authentication middleware in Express.js?

- Authentication middleware in Express.js can be implemented by creating a middleware function that verifies the user's credentials or session.

- This middleware can be added to specific routes or applied globally using app.use().

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26. How can you handle redirects in Express.js?

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- You can handle redirects in Express.js using the res.redirect() method.

```
const express = require('express');
const app = express();

app.get('/old-route', (req, res) => {
  res.redirect('/new-route');
});
```

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27. How can you access request headers in Express.js?

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- Request headers can be accessed using req.headers.
- It provides an object containing all the headers sent in the request.

```
const express = require('express');
const app = express();

app.get('/', (req, res) => {
  // Accessing specific headers
  const userAgent = req.headers['user-agent'];
  const contentType = req.headers['content-type'];

  res.send(`User Agent: ${userAgent}\nContent Type: ${contentType}`);
});
```

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28. How can you enable compression (gzip) in Express.js

- Compression can be enabled in Express.js using the compression middleware.
- By adding app.use(compression()) to your application, the responses will be automatically compressed using gzip.


```
const express = require('express');
const compression = require('compression');
const app = express();

// Middleware to enable compression
app.use(compression());
```

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29. What is the purpose of the app.route() method in Express.js?

- The app.route() method allows you to define multiple route handlers for a single URL path.
- It provides a more organized way to handle different HTTP methods on the same route.


```
const express = require('express');
const app = express();

// Route handler for '/user' route
app.route('/user')
  .get((req, res) => {
    res.send('Get user');
  })
  .post((req, res) => {
    res.send('Create user');
  })
  .put((req, res) => {
    res.send('Update user');
  })
  .delete((req, res) => {
    res.send('Delete user');
  });
```

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30. How can you implement input validation in Express.js?

- Input validation in Express.js can be implemented using middleware such as express-validator.
- This middleware helps validate request parameters, body, or query parameters against predefined rules.


```
const { body, validationResult } = require('express-validator');

const app = express();

// Middleware to parse request body
app.use(express.json());

// Route handler with input validation
app.post('/user', [
  body('name').notEmpty().withMessage('Name is required'),
  body('email').isEmail().withMessage('Invalid email'),
  body('age').isInt({ min: 18 }).withMessage('Age must be at least 18'),
], (req, res) => {
  // Check for validation errors
  const errors = validationResult(req);
  if (!errors.isEmpty()) {
    return res.status(400).json({ errors: errors.array() });
  }

  // Process the valid input
  const { name, email, age } = req.body;
```

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31. How can you handle cookies in Express.js?

- Express.js provides built-in middleware called cookie-parser for handling cookies.

- You can use it by adding the following code to your Express application:

```
const cookieParser = require('cookie-parser');
app.use(cookieParser());
```

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32. How can you implement caching in Express.js?

- Caching can be implemented in Express.js by using middleware such as express-cache-controller.
- This middleware adds appropriate cache-control headers to the response, allowing the client or intermediate caches to cache the response.


```
const cacheController = require('express-cache-controller');

const app = express();

// Middleware to set cache-control headers
app.use(cacheController());

// Route handler for serving cached responses
app.get('/data', (req, res) => {
  // Set cache-control header for the specific route
  res.cacheControl({ maxAge: 3600 }); // Cache for 1 hour

  // Send the response
  res.send('Cached data');
});
```

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33. Explain the concept of view rendering in Express.js.

- View rendering in Express.js involves using a view engine to render templates or views with dynamic data.

- The rendered output is then sent as the response to the client.

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34. How can you implement logging in Express.js?

- Logging can be implemented in Express.js using middleware such as morgan.
- This middleware logs information about incoming requests, including the request method, URL, response status, and response time.


```
// Define custom token format
morgan.token('customFormat', (req, res) => {
  const date = new Date().toLocaleDateString();
  const time = new Date().toLocaleTimeString();
  const url = req.originalUrl;
  const duration = `${res.getHeader('X-Response-Time')}ms`;
  return `[${date} ${time}] ${url} (${duration})`;
});

// Morgan middleware setup
app.use(morgan('customFormat'));
```

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35. How can you handle async/await in Express.js route handlers?

- Async/await can be used in Express.js route handlers by marking the handler function as async.
- Inside the handler, you can use await to wait for asynchronous operations to complete.


```
// Route handler using async/await
app.get('/user', async (req, res, next) => {
  try {
    // Await the asynchronous function
    const userData = await fetchUserData();

    // Process the data or perform other operations
    // ...

    res.json(userData);
  } catch (error) {
    // Pass the error to the error handling middleware
    next(error);
  }
});
```

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36. How can you implement HTTPS (SSL/TLS) in Express.js?

- HTTPS can be implemented in Express.js by creating an HTTPS server using the https module.

- You need to provide the SSL/TLS certificate and private key for secure communication.

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37. What is the purpose of the express.Router class in Express.js?

- The express.Router class allows you to create modular, mountable route handlers.

- It helps in organizing routes into separate files or modules, making the codebase more maintainable.

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38. How can you handle WebSocket communication in Express.js?

- WebSocket communication can be handled in Express.js using middleware such as express-ws or ws.

- These middleware provide WebSocket server functionality, allowing bidirectional communication between the client and server.

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39. How can you implement input sanitization in Express.js?

- Input sanitization in Express.js can be implemented using middleware such as express-validator or sanitize-html.
- These middleware help sanitize user input to prevent common security vulnerabilities like cross-site scripting (XSS) attacks.


```
const express = require('express');
const { body, validationResult } = require('express-validator');

const app = express();

// Middleware to sanitize user input
app.use(express.json());

// Route handler with input sanitization
app.post('/user', [
  body('name').trim().escape(),
  body('email').trim().isEmail().normalizeEmail(),
], (req, res) => {
  // Check for validation errors
  const errors = validationResult(req);
  if (!errors.isEmpty()) {
    return res.status(400).json({ errors: errors.array() });
  }
```

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40. How can you implement role-based access control (RBAC) in Express.js?

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- Role-based access control in Express.js can be implemented by creating a middleware function that checks the user's role and permissions before granting access to certain routes or resources.

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41. How can you handle session timeouts in Express.js?

- Session timeouts can be handled in Express.js by setting an expiration time for the session cookie or by using session management middleware that provides options for session timeout configuration.

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42. How can you handle server-side rendering (SSR) in Express.js?

- Server-side rendering in Express.js can be implemented using a view engine that supports rendering dynamic content on the server.

- Express.js can fetch data, render the view, and send the complete HTML to the client.

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43. How can you implement request throttling in Express.js?

- Request throttling in Express.js can be implemented using middleware such as express-rate-limit.
- This middleware limits the number of requests from a specific IP address or user within a specified time frame.


```
const express = require('express');
const rateLimit = require('express-rate-limit');

const app = express();

// Apply request throttling middleware
const limiter = rateLimit({
  windowMs: 15 * 60 * 1000, // 15 minutes
  max: 100, // Maximum number of requests allowed in the window
});

app.use(limiter);

// Your routes and other middleware
// ...

app.listen(3000, () => {
  console.log('Server is running on port 3000');
});
```

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44. How can you implement API versioning in Express.js?

- API versioning in Express.js can be implemented by prefixing the route paths with the desired version number, or by using custom middleware that inspects the request headers or query parameters to determine the API version to use.

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45. How can you implement pagination in Express.js?

- Pagination in Express.js can be implemented by using query parameters to specify the page number and number of items per page.

- The server can then retrieve the appropriate data subset and send it as the response.

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46. How can you implement WebSockets alongside traditional HTTP routes in Express.js?

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- You can implement WebSockets alongside traditional HTTP routes in Express.js by using a combination of middleware and libraries such as express-ws or ws.

- These libraries provide WebSocket server functionality that can be used alongside regular route handlers

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47. How can you implement server-sent events (SSE) in Express.js?

- Server-sent events can be implemented in Express.js by using the EventSource API on the client-side and creating a route handler that sends events periodically using the res.write() method and the appropriate headers.

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48. How can you handle file downloads in Express.js?

- File downloads in Express.js can be handled by setting the appropriate headers and using the res.download() method.
- This method sends the file as an attachment, prompting the user to download it.


```
const express = require('express');
const path = require('path');

const app = express();

// Route for file download
app.get('/download', (req, res) => {
  const filePath = path.join(__dirname, 'path/to/your/file.pdf');
  res.download(filePath, 'filename.pdf', (err) => {
    if (err) {
      console.error('Error downloading file:', err);
    }
  });
});

app.listen(3000, () => {
  console.log('Server is running on port 3000');
});
```

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49. How can you implement request logging in Express.js?

- Request logging in Express.js can be implemented by using middleware such as morgan.

- This middleware logs information about incoming requests, including the request method, URL, response status, and response time.

```
const express = require('express');
const morgan = require('morgan');
const app = express();
app.use(morgan('combined')); // Other options like Tiny etc
```

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50. How to convert JSON into string in Expressjs?

- In Express.js, you can convert a JavaScript object or JSON data into a string using the JSON.stringify() method.
- Here's an example of how you can convert JSON into a string in an Express.js route handler:

```
app.get('/convert', (req, res) => {
  const jsonData = {
    name: 'John Doe',
    age: 30,
    city: 'New York'
  };

  const jsonString = JSON.stringify(jsonData);

  res.send(jsonString);
});
```

Thank you.

Keep Learning. Keep Growing.

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