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Experiment – 8

Aim: To code and register a service worker, and complete the install and activation process for a new service worker for the E-commerce PWA.

Theory:

Service Worker is a script that works on browser background without user interaction independently. Also, It resembles a proxy that works on the user side. With this script, you can track network traffic of the page, manage push notifications and develop "offline first" web applications with Cache API.

Things to note about Service Worker:

- A service worker is a programmable network proxy that lets you control how network requests from your page are handled.
- Service workers only run over HTTPS. Because service workers can intercept network requests and modify responses, "man-in-the-middle" attacks could be very bad.
- The service worker becomes idle when not in use and restarts when it's next needed. You cannot rely on a global state persisting between events. If there is information that you need to persist and reuse across restarts, you can use IndexedDB databases.

What can we do with Service Workers?
- You can dominate **Network Traffic**

  You can manage all network traffic of the page and do any manipulations. For example, when the page requests a CSS file, you can send plain text as a response or when the page requests an HTML file, you can send a png file as a response. You can also send a true response too.
- You can **Cache**

  You can cache any request/response pair with Service Worker and Cache API and you can access these offline content anytime.
- You can manage **Push Notifications**

You can manage push notifications with Service Worker and show any information message to the user.

- You can **Continue**
Although Internet connection is broken, you can start any process with Background Sync of Service Worker.

Here's a theory on how to code and register a service worker and complete the installation and activation process for a new service worker:

Service Worker Registration:

Start by creating a JavaScript file for the service worker (e.g., service-worker.js).

In your main HTML file (e.g., index.html), include code to register the service worker. This code typically resides within a <script> tag and should be placed near the bottom of the <body> tag to ensure the DOM content is fully loaded before registering the service worker.

Use the navigator.serviceWorker.register() method to register the service worker script. This method takes the path to the service worker script as its parameter.

It's a best practice to perform feature detection to check if the browser supports service workers before attempting to register one.

Service Worker Installation:

Once the service worker is registered, the browser will attempt to install it.

Inside the service worker script, listen for the install event. This event is triggered when the browser detects a new service worker for the first time.

Upon installation, you can perform tasks such as caching static assets (HTML, CSS, JavaScript, images) using the Cache API. This ensures that the application shell is available offline.

During installation, pre-cache essential assets by fetching and storing them in the cache storage.

Service Worker Activation:

After the service worker is successfully installed, it enters the activation phase.

Listen for the activate event inside the service worker script. This event is triggered once the service worker becomes active.

During activation, you can clean up old caches from previous versions of the service worker to ensure the application uses the latest assets.

Remove outdated caches using the CacheStorage API, typically by comparing cache keys to the current version and deleting obsolete caches.

Testing and Debugging:

Test the service worker functionality thoroughly, both in online and offline scenarios, to ensure proper caching and offline behavior.

Use browser developer tools to debug service worker code, inspect cache storage, and monitor service worker lifecycle events.

Consider implementing logging and error handling within the service worker to facilitate debugging in production environments.

Code:
index.html:

```html
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
    <meta http-equiv="X-UA-Compatible" content="IE=edge">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <!-- CSS LINK -->
    <link rel="stylesheet" href="style.css">
    <!-- Fontawesome -->
    <link rel="stylesheet" href="https://cdnjs.cloudflare.com/ajax/libs/font-
awesome/6.1.1/css/all.min.css" integrity="sha512-
KfkfwYDsLkIlwQp6LFnl8zNdLGxu9YAA1QvwINks4PhcElQSvqcyVLLD9aMhXd13uQjoXtEKNosOWa
ZqXgel0g==" crossorigin="anonymous" referrerpolicy="no-referrer" />
    <title>Cok Sayfali Web Sitesi | Nizami Sevindi</title>
</head>
    <!-- Google tag (gtag.js) -->
<script async src="https://www.googletagmanager.com/gtag/js?id=G-
PX8CKQHBTF"></script>
<script>
  window.dataLayer = window.dataLayer || [];
```

```html
      function gtag(){dataLayer.push(arguments);}
    gtag('js', new Date());

    gtag('config', 'G-PX8CKQHBTF');
</script>
<body>
    <!------------------------------------------- HEADER SECTION -->
    <header class="header" >
        <a href="#" class="logo">
            <img src="./image/pngegg.png" alt="logo">
        </a>
        <nav class="navbar">
            <a href="./index.html" class="active">home</a>
            <a href="./about.html">about</a>
            <a href="./menu.html">menu</a>
            <a href="./products.html">products</a>
            <a href="./review.html">review</a>
            <a href="./contact.html">contact</a>
            <a href="./blog.html">blog</a>
        </nav>
        <div class="buttons">
            <button id="search-btn">
                <i class="fas fa-search"></i>
            </button>
            <button id="cart-btn">
                <i class="fas fa-shopping-cart"></i>
            </button>
            <button id="menu-btn">
                <i class="fas fa-bars"></i>
            </button>
        </div>
        <div class="search-form">
            <input type="text" class="search-input" id="search-box"
placeholder="Search">
            <i class="fas fa-search"></i>
        </div>
        <div class="cart-items-container">
            <div class="cart-item">
                <i class="fas fa-times"></i>
                <img src="./image/pngwing.com (1).png" alt="menu">
                <div class="content">
                    <h3>cart item 01</h3>
                    <div class="price">$15.99 </div>
                </div>
            </div>
            <div class="cart-item">
                <i class="fas fa-times"></i>
                <img src="./image/pngwing.com (2).png" alt="menu">
```

```html
                <div class="content">
                    <h3>cart item 02</h3>
                    <div class="price">$16.99 </div>
                </div>
            </div>
            <div class="cart-item">
                <i class="fas fa-times"></i>
                <img src="./image/pngwing.com (3).png" alt="menu">
                <div class="content">
                    <h3>cart item 03</h3>
                    <div class="price">$13.99 </div>
                </div>
            </div>
            <div class="cart-item">
                <i class="fas fa-times"></i>
                <img src="./image/pngwing.com (4).png" alt="menu">
                <div class="content">
                    <h3>cart item 04</h3>
                    <div class="price">$12.99 </div>
                </div>
            </div>
            <a href="#" class="btn">check out </a>
        </div>
    </header>
    <!---------------------------------------------HEADER SECTION -->


    <!---------------------------------------------HOME SECTION -->
    <section class="home" id="home">
        <div class="content">
        <h3>Fast Food Delivery</h3>
        <p>Lorem ipsum dolor sit amet consectetur adipisicing elit. Incidunt
perferendis obcaecati iste voluptatum, quaerat nihil magnam numquam sint? </p>
        <a href="#" class="btn">order now</a>
        </div>
    </section>
    <!---------------------------------------------HOME SECTION -->


    <!---------------------------------------------MENU SECTION -->
    <section class="menu" id="menu">
        <h1 class="heading">our <span>menu</span></h1>
        <div class="box-container">
            <div class="box">

                <div class="box-head">
                    <img src="./image/pngwing.com.png" alt="">
                    <span class="menu-category">Pizza</span>
                    <h3>6 Mini Pizzas</h3>
                    <div class="price">$104.99 <span>$119.99</span></div>
```

```
                </div>
                <div class="box-bottom">
                    <a href="#" class="btn">add to cart</a>
                </div>
            </div>
            <div class="box">

                <div class="box-head">
                    <img src="./image/pngwing.com (2).png" alt="">
                    <span class="menu-category">Burger</span>
                    <h3>5 Mini Burgers</h3>
                    <div class="price">$99.99 <span>$105.99</span></div>
                </div>
                <div class="box-bottom">
                    <a href="#" class="btn">add to cart</a>
                </div>
            </div>
            <div class="box">

                <div class="box-head">
                    <img src="./image/pngwing.com (1).png" alt="">
                    <span class="menu-category">Pizza</span>
                    <h3>2 Mixed Pizzas</h3>
                    <div class="price">$49.99 <span>$59.99</span></div>
                </div>
                <div class="box-bottom">
                    <a href="#" class="btn">add to cart</a>
                </div>
            </div>
            <div class="box">

                <div class="box-head">
                    <img src="./image/pngwing.com (3).png" alt="">
                    <span class="menu-category">Burger</span>
                    <h3>3 Meatball Burgers</h3>
                    <div class="price">$79.99 <span>$99.99</span></div>
                </div>
                <div class="box-bottom">
                    <a href="#" class="btn">add to cart</a>
                </div>
            </div>
        </div>
    </section>
    <!------------------------------------------MENU SECTION -->


    <!------------------------------------------PRODUCTS SECTION -->
    <section class="products" id="products">
        <h1 class="heading">our <span>products</span> </h1>
```

```html
<div class="box-container">
    <div class="box">
        <div class="box-head">
            <span class="title">mini burger</span>
            <a href="#" class="name">Bacon Burger</a>
        </div>
        <div class="image">
            <img src="./image/pngwing.com (6).png" alt="">
        </div>
        <div class="box-bottom">
            <div class="info">
                <b class="price">$6.00</b>
                <span class="amount">110gr / 300 Cal</span>
            </div>
            <div class="product-btn">
                <a href="#">
                    <i class="fas fa-plus"></i>
                </a>
            </div>
        </div>
    </div>
    <div class="box">
        <div class="box-head">
            <span class="title">cheese burger</span>
            <a href="#" class="name">cheese Burger</a>
        </div>
        <div class="image">
            <img src="./image/pngwing.com (4).png" alt="">
        </div>
        <div class="box-bottom">
            <div class="info">
                <b class="price">$12.00</b>
                <span class="amount">140gr / 2500 Cal</span>
            </div>
            <div class="product-btn">
                <a href="#">
                    <i class="fas fa-plus"></i>
                </a>
            </div>
        </div>
    </div>
    <div class="box">
        <div class="box-head">
            <span class="title">Double burger</span>
            <a href="#" class="name">Double Burger</a>
        </div>
        <div class="image">
            <img src="./image/pngwing.com (5).png" alt="">
```

```html
                </div>
                <div class="box-bottom">
                    <div class="info">
                        <b class="price">$24.00</b>
                        <span class="amount">440gr / 600 Cal</span>
                    </div>
                    <div class="product-btn">
                        <a href="#">
                            <i class="fas fa-plus"></i>
                        </a>
                    </div>
                </div>
            </div>
        </div>
    </section>
    <!------------------------------------------PRODUCTS SECTION -->


    <!------------------------------------------ABOUT US SECTION -->
    <section class="about" id="about">
        <h1 class="heading">about <span>us</span> </h1>

        <div class="row">
            <div class="image">
                <img src="./image/pngwing.com (7).png" alt="">
            </div>
            <div class="content">
                <h3>What is the secret receipe of our burgers</h3>
                <div class="paragraph">
                    <p>Lorem ipsum, dolor sit amet consectetur adipisicing
elit. Quia officia id et, corrupti assumenda.</p>
                    <p>Lorem ipsum, dolor sit amet consectetur adipisicing
elit. Quia officia id et, corrupti assumenda.</p>
                    <p>Lorem ipsum, dolor sit amet consectetur adipisicing
elit. Quia officia id et, corrupti assumenda.</p>
                </div>
                <a href="#" class="btn">Learn More</a>
            </div>
        </div>
    </section>
    <!------------------------------------------ABOUT US SECTION -->


    <!------------------------------------------REVIEW SECTION -->
    <section class="review" id="review">
        <h1 class="heading">customer's <span>review</span> </h1>
        <div class="box-container">
            <div class="box">
                <img src="./image/pngwing.com (8).png" alt="quote">
```

```html
                <p> Dicta totam suscipit vero praesentium excepturi facilis,
fuga at architecto dolor tempora molestias quam dignissimos sit. Molestiae
temporibus ratione quas placeat possimus!</p>
                <img src="./image/pngwing.com (9).png" alt="customer-avatar"
class="user">
                <h3>Patrick Hellinger</h3>
                <div class="stars">
                    <i class="fas fa-star"></i>
                    <i class="fas fa-star"></i>
                    <i class="fas fa-star"></i>
                    <i class="fas fa-star"></i>
                    <i class="fas fa-star-half-alt"></i>
                </div>
            </div>
            <div class="box">
                <img src="./image/pngwing.com (8).png" alt="quote">
                <p>Lorem ipsum dolor sit amet consectetur adipisicing elit.
Fuga at architecto dolor tempora molestias quam dignissimos sit. Molestiae
temporibus ratione quas placeat possimus!</p>
                <img src="./image/pngwing.com (10).png" alt="customer-avatar"
class="user">
                <h3>Serena Williams</h3>
                <div class="stars">
                    <i class="fas fa-star"></i>
                    <i class="fas fa-star"></i>
                    <i class="fas fa-star"></i>
                    <i class="fas fa-star"></i>
                    <i class="fas fa-star-half-alt"></i>
                </div>
            </div>
            <div class="box">
                <img src="./image/pngwing.com (8).png" alt="quote">
                <p>Lorem ipsum dolor sit amet consectetur adipisicing elit.
Dicta totam suscipit vero praesentium excepturi facilis, fuga at architecto
dolor tempora molestias quam dignissimos possimus!</p>
                <img src="./image/pngwing.com (11).png" alt="customer-avatar"
class="user">
                <h3>Helen Marksen</h3>
                <div class="stars">
                    <i class="fas fa-star"></i>
                    <i class="fas fa-star"></i>
                    <i class="fas fa-star"></i>
                    <i class="fas fa-star"></i>
                    <i class="fas fa-star-half-alt"></i>
                </div>
            </div>
        </div>
    </section>
```

```html
    <!-------------------------------------------REVIEW SECTION -->
    <!-------------------------------------------CONTACT SECTION -->
    <section class="contact" id="contact">
        <h1 class="heading">contact <span>us</span> </h1>
        <div class="row">
            <iframe class="map"
src="https://www.google.com/maps/embed?pb=!1m18!1m12!1m3!1d983.3235940970079!2
d8.540719273659763!3d47.3713194174677!2m3!1f0!2f0!3f0!3m2!1i1024!2i768!4f13.1!
3m3!1m2!1s0x47900a00aa1e1d17%3A0x278f576acdd580f5!2sStorchen%20Z%C3%BCrich%20-
%20Lifestyle%20Boutique%20Hotel!5e0!3m2!1sde!2sch!4v1658505945506!5m2!1sde!2sc
h" allowfullscreen="" loading="lazy" referrerpolicy="no-referrer-when-
downgrade"></iframe>
            <form>
                <h3>get in touch</h3>
                <div class="inputBox">
                    <i class="fas fa-user"></i>
                    <input type="text" placeholder="name">
                </div>
                <div class="inputBox">
                    <i class="fas fa-envelope"></i>
                    <input type="email" placeholder="email">
                </div>
                <div class="inputBox">
                    <i class="fas fa-phone"></i>
                    <input type="number" placeholder="number">
                </div>
                <input type="submit" class="btn" value="contact now">
            </form>
        </div>
    </section>
    <!-------------------------------------------CONTACT SECTION -->

    <!-------------------------------------------BLOG SECTION -->
    <section class="blog" id="blog">
        <h1 class="heading">our <span>blog</span> </h1>
        <div class="box-container">
            <div class="box-full">
                <div class="image">
                    <img src="./image/delicious-burger-on-wooden-board-2022-
03-04-05-58-25-utc.jpg" alt="">
                </div>
                <div class="content">
                    <a href="#" class="title">how to make burgers</a>
                    <span>by admin / 10st may, 2020</span>
                    <p>Lorem ipsum dolor sit amet, consectetur adipisicing
elit. Minus eos esse nesciunt cupiditate expedita.</p>
                    <a href="#" class="btn">read more</a>
                </div>
```

```html
            </div>
            <div class="box-full">
                <div class="image">
                    <img src="./image/delicious-tasty-burgers-on-wooden-
background-2021-08-26-15-25-13-utc.jpg" alt="">
                </div>
                <div class="content">
                    <a href="#" class="title">how to make burgers</a>
                    <span>by admin / 10st may, 2020</span>
                    <p>Lorem ipsum dolor sit amet, consectetur adipisicing
elit. Minus eos esse nesciunt cupiditate expedita.</p>
                    <a href="#" class="btn">read more</a>
                </div>
            </div>
            <div class="box-full">
                <div class="image">
                    <img src="./image/handmade-burger-on-dark-background-
delicious-blac-2021-10-21-02-27-27-utc.jpg" alt="">
                </div>
                <div class="content">
                    <a href="#" class="title">how to make burgers</a>
                    <span>by admin / 10st may, 2020</span>
                    <p>Lorem ipsum dolor sit amet, consectetur adipisicing
elit. Minus eos esse nesciunt cupiditate expedita.</p>
                    <a href="#" class="btn">read more</a>
                </div>
            </div>
        </div>
    </section>
    <!------------------------------------------BLOG SECTION -->

    <!------------------------------------------FOOTER SECTION -->
    <section class="footer">
        <div class="search">
            <input type="text" class="search-input" placeholder="Search">
            <button class="btn btn-primary">search</button>
        </div>
        <div class="share">
            <a href="#" class="fab fa-facebook"></a>
            <a href="#" class="fab fa-twitter"></a>
            <a href="#" class="fab fa-instagram"></a>
            <a href="#" class="fab fa-linkedin"></a>
            <a href="#" class="fab fa-pinterest"></a>
        </div>
        <div class="links">
            <a href="#home">home</a>
            <a href="#about">about</a>
            <a href="#menu">menu</a>
```

```html
            <a href="#products">products</a>
            <a href="#review">review</a>
            <a href="#contact">contact</a>
            <a href="#blog">blog</a>
        </div>
        <div class="credit">
            creaated by <span>Nizami Sevindi</span> | all rights reserved!
        </div>
    </section>
    <!------------------------------------------FOOTER SECTION -->

<script src="./script.js"></script>
</body>
</html>
```

main.css:

```css
main.css:
* {
    margin: 0;
    padding: 0;
}

.navbar {
    display: flex;
    align-items: center;
    justify-content: center;
    position: sticky;
    top: 0;
    padding: 15px;
    cursor: pointer;
}

.background {
    background: black;
    background-blend-mode: darken;
    background-size: cover;
}

.nav-list {
    width: 70%;
    display: flex;
    align-items: center;
    gap: 20px;
    list-style: none;
```

```css
}

.logo {
    display: flex;
    justify-content: center;
    align-items: center;
}

.logo img {
    width: 180px;
    border-radius: 50px;
}

.nav-list li {
    list-style: none;
    padding: 26px 30px;
    padding: 10px;
}

.nav-list li a {
    text-decoration: none;
    color: white;
}

.nav-list li a:hover {
    color: grey;
}

.rightnav {
    width: 30%;
    text-align: right;
}

#search {
    padding: 5px;
    font-size: 17px;
    border: 2px solid grey;
    border-radius: 9px;
}

.firstsection {
    background-color: green;
    height: 400px;
}

.secondsection {
    background-color: blue;
```

```css
    height: 400px;
}

.box-main {
    display: flex;
    justify-content: center;
    align-items: center;
    color: black;
    max-width: 80%;
    margin: auto;
    height: 80%;
}

.firsthalf {
    width: 100%;
    display: flex;
    flex-direction: column;
    justify-content: center;
}

.secondhalf {
    width: 30%;
}

.secondhalf img {
    width: 70%;
    border: 4px solid white;
    border-radius: 150px;
    display: block;
    margin: auto;
}

.text-big {
    font-family: 'Piazzolla', serif;
    font-weight: bold;
    font-size: 35px;
}

.text-small {
    font-size: 18px;
}

.btn {
    padding: 8px 20px;
    margin: 7px 0;
    border: 2px solid white;
    border-radius: 8px;
```

```css
    background: none;
    color: white;
    cursor: pointer;
}

.btn-sm {
    padding: 6px 10px;
    vertical-align: middle;
}

.section {
    height: 400px;
    display: flex;
    align-items: center;
    justify-content: center;
    max-width: 90%;
    margin: auto;
}

.section-Left {
    flex-direction: row-reverse;
}

.paras {
    padding: 0px 65px;
}

.thumbnail img {
    width: 250px;
    border: 2px solid black;
    border-radius: 26px;
    margin-top: 19px;
}

.center {
    text-align: center;
}

.text-footer {
    text-align: center;
    padding: 30px 0;
    font-family: 'Ubuntu', sans-serif;
    display: flex;
    justify-content: center;
    color: white;
}
```

```css
footer {
    text-align: center;
    padding: 15px;
}


.rightnav {
    width: 100%;
    text-align: right;
    margin-top: 10px;
}

#search {
    box-sizing: border-box;
    width: 70%;
    padding: 8px;
    font-size: 17px;
    border: 2px solid grey;
    border-radius: 9px;
}

.btn-sm {
    padding: 8px 20px;
    margin: 7px 5px;
}

img {
    max-width: 100%;
    height: auto;
}
```

App.js:
```javascript
if ('serviceWorker' in navigator) {

    window.addEventListener('load', () => {
        navigator.serviceWorker.register('/service-worker.js')
            .then(registration => {
                console.log('Service Worker registered with scope:', registration.scope);
            })
            .catch(error => {
                console.error('Service Worker registration failed:', error);
            });
    });
}
```
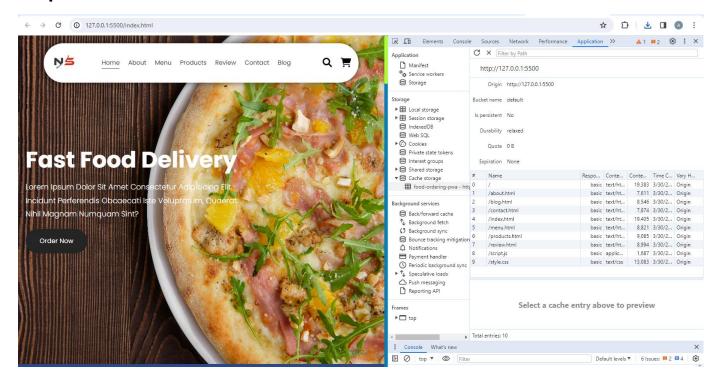
Service-worker.js:

```javascript
// service-worker.js


const cacheName = 'gfg-pwa-v1';
const assetsToCache = [
  '/',
  '/index.html',
  '/main.css',
  '/app.js'
  // Add more files and assets here as needed
];


self.addEventListener('install', event => {
  event.waitUntil(
    caches.open(cacheName)
      .then(cache => {
        return cache.addAll(assetsToCache);
      })
  );
});


self.addEventListener('activate', event => {
  event.waitUntil(
    caches.keys().then(cacheNames => {
      return Promise.all(
        cacheNames.filter(name => {
          return name !== cacheName;
        }).map(name => {
          return caches.delete(name);
        })
      );
    })
  );
});
```
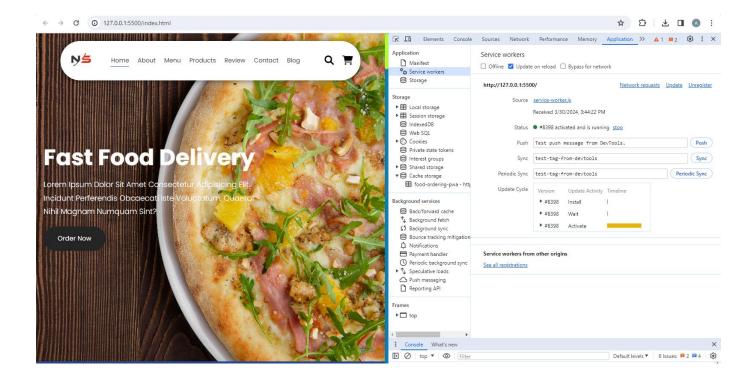
Steps for Execution:-
- Create a folder and put all 4 files main.css , service-worker.js, app.js, index.html
- Open visual studio

- Install extension Live server
- Open folder in visual studio open index.html
- On bottom right corner click go Live
- It will open html page in browser
- Go to developer tools

Output:

Conclusion:

In this experiment, we have registered a service worker, and completed the install and activation process for a new service worker for the PWA.