

# React + Material UI Task Manager SPA Tutorial

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## Objective

Build a modern single-page application (SPA) using React and Material UI that includes:

- Task management (Add/Delete)
- Persistent tasks using LocalStorage
- Task priorities and due dates
- Light/Dark theme switcher
- Global state with Context API

## Step 1: Set up the Project

```
npm create vite@latest task-manager --template react
cd task-manager
npm install
npm install @mui/material @emotion/react @emotion/styled
npm install @mui/icons-material react-router-dom
```

## Step 2: Basic Folder Structure

```
src/
|-- components/
|   |-- TaskList.jsx
|   |-- AddTask.jsx
|   |-- Navbar.jsx
|   |-- ThemeToggle.jsx
|-- pages/
|   |-- Home.jsx
|   |-- About.jsx
|-- context/
|   |-- TaskContext.jsx
|-- App.jsx
|-- main.jsx
```

## Step 3: Add Theme Context and Task Context

### ThemeToggle.jsx

```
import { IconButton } from '@mui/material';
import Brightness4Icon from '@mui/icons-material/Brightness4';
import Brightness7Icon from '@mui/icons-material/Brightness7';
import { useTheme } from '@mui/material/styles';
import { useColorMode } from '../context/TaskContext';

export default function ThemeToggle() {
  const theme = useTheme();
  const colorMode = useColorMode();
  return (
    <IconButton onClick={colorMode.toggleColorMode} color="inherit">
      {theme.palette.mode === 'dark' ? <Brightness7Icon /> : <Brightness4Icon />}
    </IconButton>
  );
}
```

### TaskContext.jsx

```
import React, { createContext, useContext, useMemo, useState, useEffect } from 'react';
import { createTheme, ThemeProvider } from '@mui/material/styles';

const TaskContext = createContext();
const ColorModeContext = createContext({ toggleColorMode: () => {} });

export const useTasks = () => useContext(TaskContext);
export const useColorMode = () => useContext(ColorModeContext);

export function AppProvider({ children }) {
  const [tasks, setTasks] = useState(() => {
    const saved = localStorage.getItem('tasks');
    return saved ? JSON.parse(saved) : [];
  });
  const [mode, setMode] = useState('light');

  useEffect(() => {
    localStorage.setItem('tasks', JSON.stringify(tasks));
  }, [tasks]);

  const colorMode = useMemo(() => ({
    toggleColorMode: () => {
      setMode((prev) => (prev === 'light' ? 'dark' : 'light'));
    },
  }), []);

  const theme = useMemo(() => createTheme({
    palette: {
      mode,
    },
  }), [mode]);

  return (
    <ColorModeContext.Provider value={colorMode}>
      <TaskContext.Provider value={{ tasks, setTasks }}>
        <ThemeProvider theme={theme}>{children}</ThemeProvider>
      </TaskContext.Provider>
    </ColorModeContext.Provider>
  );
}
```

## Step 4: Modify main.jsx and App.jsx

### main.jsx

```
import React from 'react';
import ReactDOM from 'react-dom/client';
import App from './App';
import { BrowserRouter } from 'react-router-dom';
import { AppProvider } from '../context/TaskContext';

ReactDOM.createRoot(document.getElementById('root')).render(
  <BrowserRouter>
    <AppProvider>
      <App />
    </AppProvider>
  </BrowserRouter>
);
```

### App.jsx

```
import React from 'react';
import { Routes, Route } from 'react-router-dom';
import Home from './pages/Home';
import About from './pages/About';
import Navbar from './components/Navbar';
import { CssBaseline } from '@mui/material';

const App = () => (
  <>
    <CssBaseline />
    <Navbar />
    <Routes>
      <Route path="/" element={ <Home /> } />
      <Route path="/about" element={ <About /> } />
    </Routes>
  </>
);

export default App;
```

## Step 5: Updated Task Components with Priority and Due Date

### AddTask.jsx

```
import { useState } from 'react';
import { TextField, Button, Box, MenuItem } from '@mui/material';
import { useTasks } from '../context/TaskContext';

export default function AddTask() {
  const { setTasks } = useTasks();
  const [task, setTask] = useState('');
  const [priority, setPriority] = useState('Normal');
  const [due, setDue] = useState('');

  const handleAdd = () => {
    if (task.trim()) {
      setTasks(prev => [...prev, { task, priority, due }]);
      setTask(''); setPriority('Normal'); setDue('');
    }
  };
}
```

```

return (
  <Box display="flex" gap={2} my={2} flexDirection="column">
    <TextField label="New Task" value={task} onChange={(e) => setTask(e.target.value)} />
    <TextField label="Due Date" type="date" value={due} onChange={(e) => setDue(e.target.value)} InputLabelProps={{ shrink: true }} />
    <TextField label="Priority" select value={priority} onChange={(e) => setPriority(e.target.value)}>
      <MenuItem value="Low">Low</MenuItem>
      <MenuItem value="Normal">Normal</MenuItem>
      <MenuItem value="High">High</MenuItem>
    </TextField>
    <Button variant="contained" onClick={handleAdd}>Add</Button>
  </Box>
);
}

```

## TaskList.jsx

```

import { List, ListItem, ListItemText, IconButton } from '@mui/material';
import DeleteIcon from '@mui/icons-material/Delete';
import { useTasks } from '../context/TaskContext';

export default function TaskList() {
  const { tasks, setTasks } = useTasks();
  const handleDelete = (index) => {
    const updated = [...tasks];
    updated.splice(index, 1);
    setTasks(updated);
  };

  return (
    <List>
      {tasks.map((item, index) => (
        <ListItem key={index} secondaryAction={
          <IconButton edge="end" onClick={() => handleDelete(index)}>
            <DeleteIcon />
          </IconButton>
        )}
        <ListItemText
          primary={` ${item.task} (Priority: ${item.priority}) `}
          secondary={`Due: ${item.due}`}
        </>
      ))}
    </List>
  );
}

```

## Step 6: Home and About Pages

### Home.jsx

```

import { Container, Typography } from '@mui/material';
import AddTask from '../components/AddTask';
import TaskList from '../components/TaskList';

export default function Home() {
  return (
    <Container>
      <Typography variant="h4" my={2}>My Tasks</Typography>
      <AddTask />
      <TaskList />
    </Container>
  );
}

```

```
    </Container>
  );
}
```

## About.jsx

```
import { Container, Typography } from '@mui/material';

export default function About() {
  return (
    <Container>
      <Typography variant="h4" my={2}>About</Typography>
      <Typography>This is a task manager app built with React, Material UI, and Context API.
    </Typography>
    </Container>
  );
}
```