This example demonstrates Scope Hoisting in combination with Code Splitting.

This is the dependency graph for the example: (solid lines express sync imports, dashed lines async imports)

All modules except `cjs` are EcmaScript modules. `cjs` is a CommonJs module.

The interesting thing here is that putting all modules in single scope won't work, because of multiple reasons:

- Modules `lazy`, `c`, `d` and `cjs` need to be in a separate chunk
- Module `shared` is accessed by two chunks (different scopes)
- Module `cjs` is a CommonJs module

webpack therefore uses a approach called **"Partial Scope Hoisting"** or "Module concatenation", which chooses the largest possible subsets of ES modules which can be scope hoisted and combines them with the default webpack primitives.

While module concatenation identifiers in modules are renamed to avoid conflicts and internal imports are simplified. External imports and exports from the root module use the existing ESM constructs.

example.js

```
import { a, x, y } from "a";
import * as b from "b";

import("./lazy").then(function(lazy) {
    console.log(a, b.a(), x, y, lazy.c, lazy.d.a, lazy.x, lazy.y);
});
```

lazy.js

```
export * from "c";
import * as d from "d";
export { d };
```

a.js

```
// module a
export var a = "a";
export * from "shared";
```

b.js

```
// module b
export function a() {
    return "b";
};
```

c.js

```
// module c
import { c as e } from "cjs";

export var c = String.fromCharCode(e.charCodeAt(0) - 2);

export { x, y } from "shared";
```

d.js

```
// module d
export var a = "d";
```

cjs.js

```
// module cjs (commonjs)
exports.c = "e";
```

shared.js

```
// shared module
export var x = "x";
export * from "shared2";
```

shared2.js

```
// shared2 module
export var y = "y";
```

webpack.config.js

```
module.exports = {
    // mode: "development" || "production",
    optimization: {
        usedExports: true,
        concatenateModules: true,
        chunkIds: "deterministic" // To keep filename consistent between different
modes (for example building only)
    }
};
```

dist/output.js

```
/******/ (() => { // webpackBootstrap
/******/ 	"use strict";
/******/ 	var __webpack_modules__ = ([
/* 0 */,
/* 1 */
/*!*****************************************!*\
  !*** ./node_modules/shared.js + 1 modules ***!
  \*****************************************/
/*! namespace exports */
/*! export x [provided] [used in main] [could be renamed] */
/*! export y [provided] [used in main] [could be renamed] ->
./node_modules/shared2.js .y */
/*! runtime requirements: __webpack_exports__, __webpack_require__.d,
__webpack_require__.* */
/***/ ((__unused_webpack_module, __webpack_exports__, __webpack_require__) => {


// EXPORTS
__webpack_require__.d(__webpack_exports__, {
  "x": () => (/* binding */ x),
  "y": () => (/* reexport */ y)
});

;// CONCATENATED MODULE: ./node_modules/shared2.js
// shared2 module
var y = "y";

;// CONCATENATED MODULE: ./node_modules/shared.js
// shared module
var x = "x";
```

```
/***/ })
/******/ 	]);
```

▶ /* webpack runtime code */

```
var __webpack_exports__ = {};
// This entry need to be wrapped in an IIFE because it need to be isolated against
other modules in the chunk.
(() => {
/*!*********************************!*\
  !*** ./example.js + 2 modules ***!
  \*********************************/
/*! namespace exports */
/*! runtime requirements: __webpack_require__, __webpack_require__.e,
__webpack_require__.* */
/*! ModuleConcatenation bailout: Cannot concat with ./node_modules/shared.js: Module
./node_modules/shared.js is referenced from different chunks by these modules:
./node_modules/c.js */

// EXTERNAL MODULE: ./node_modules/shared.js + 1 modules
var shared = __webpack_require__(1);
;// CONCATENATED MODULE: ./node_modules/a.js
// module a
var a = "a";


;// CONCATENATED MODULE: ./node_modules/b.js
// module b
function b_a() {
    return "b";
};

;// CONCATENATED MODULE: ./example.js



__webpack_require__.e(/*! import() */
872).then(__webpack_require__.bind(__webpack_require__, /*! ./lazy */
2)).then(function(lazy) {
    console.log(a, b_a(), shared.x, shared.y, lazy.c, lazy.d.a, lazy.x, lazy.y);
});

})();

/******/ })()
;
```

dist/872.output.js

```
(self["webpackChunk"] = self["webpackChunk"] || []).push([[872],[
/* 0 */,
/* 1 */,
/* 2 */
/*!****************************!*\
  !*** ./lazy.js + 2 modules ***!
  \****************************/
/*! namespace exports */
/*! export c [provided] [maybe used in main (runtime-defined)] [usage prevents
renaming] -> ./node_modules/c.js .c */
/*! export d [provided] [maybe used in main (runtime-defined)] [usage prevents
renaming] -> ./node_modules/d.js */
/*!   export a [provided] [maybe used in main (runtime-defined)] [usage prevents
renaming] */
/*!   other exports [not provided] [maybe used in main (runtime-defined)] */
/*! export x [provided] [maybe used in main (runtime-defined)] [usage prevents
renaming] -> ./node_modules/shared.js + 1 modules .x */
/*! export y [provided] [maybe used in main (runtime-defined)] [usage prevents
renaming] -> ./node_modules/shared2.js .y */
/*! other exports [not provided] [maybe used in main (runtime-defined)] */
/*! runtime requirements: __webpack_require__.r, __webpack_exports__,
__webpack_require__.d, __webpack_require__, __webpack_require__.* */
/*! ModuleConcatenation bailout: Cannot concat with ./node_modules/cjs.js: Module is
not an ECMAScript module */
/*! ModuleConcatenation bailout: Cannot concat with ./node_modules/shared.js: Module
./node_modules/shared.js is not in the same chunk(s) (expected in chunk(s) unnamed
chunk(s), module is in chunk(s) ) */
/***/ ((__unused_webpack_module, __webpack_exports__, __webpack_require__) => {

"use strict";
// ESM COMPAT FLAG
__webpack_require__.r(__webpack_exports__);

// EXPORTS
__webpack_require__.d(__webpack_exports__, {
  "c": () => (/* reexport */ c),
  "d": () => (/* reexport */ d_namespaceObject),
  "x": () => (/* reexport */ shared.x),
  "y": () => (/* reexport */ shared.y)
});

// NAMESPACE OBJECT: ./node_modules/d.js
var d_namespaceObject = {};
__webpack_require__.r(d_namespaceObject);
__webpack_require__.d(d_namespaceObject, {
  "a": () => (a)
});

// EXTERNAL MODULE: ./node_modules/cjs.js
var cjs = __webpack_require__(3);
// EXTERNAL MODULE: ./node_modules/shared.js + 1 modules
```

```
var shared = __webpack_require__(1);
;// CONCATENATED MODULE: ./node_modules/c.js
// module c


var c = String.fromCharCode(cjs.c.charCodeAt(0) - 2);



;// CONCATENATED MODULE: ./node_modules/d.js
// module d
var a = "d";

;// CONCATENATED MODULE: ./lazy.js




/***/ }),
/* 3 */
/*!*****************************!*\
  !*** ./node_modules/cjs.js ***!
  \*****************************/
/*! default exports */
/*! export c [provided] [used in main] [could be renamed] */
/*! runtime requirements: __webpack_exports__ */
/*! ModuleConcatenation bailout: Module is not an ECMAScript module */
/***/ ((__unused_webpack_module, exports) => {

// module cjs (commonjs)
exports.c = "e";


/***/ })
]]);
```

Minimized

```
(self.webpackChunk=self.webpackChunk||[]).push([[872],{872:(r,e,a)=>{"use
strict";a.r(e),a.d(e,{c:()=>C,d:()=>c,x:()=>h.x,y:()=>s.y});var c={};a.r(c),a.d(c,
{a:()=>k});var
d=a(75),h=a(845),s=a(383),C=String.fromCharCode(d.c.charCodeAt(0)-2),k="d"},75:
(r,e)=>{e.c="e"}}]);
```

Info

Unoptimized

```
asset output.js 11.2 KiB [emitted] (name: main)
asset 872.output.js 2.74 KiB [emitted]
chunk (runtime: main) output.js (main) 367 bytes (javascript) 5.54 KiB (runtime)
[entry] [rendered]
  > ./example.js main
  runtime modules 5.54 KiB 8 modules
  dependent modules 100 bytes [dependent] 1 module
  ./example.js + 2 modules 267 bytes [built] [code generated]
    [no exports]
    [no exports used]
    entry ./example.js main
chunk (runtime: main) 872.output.js 263 bytes [rendered]
  > ./lazy ./example.js 4:0-16
  dependent modules 42 bytes [dependent] 1 module
  ./lazy.js + 2 modules 221 bytes [built] [code generated]
    [exports: c, d, x, y]
    import() ./lazy ./example.js + 2 modules ./example.js 4:0-16
webpack 5.51.1 compiled successfully
```

Production mode

```
asset output.js 2.11 KiB [emitted] [minimized] (name: main)
asset 872.output.js 270 bytes [emitted] [minimized]
chunk (runtime: main) output.js (main) 367 bytes (javascript) 5.54 KiB (runtime)
[entry] [rendered]
  > ./example.js main
  runtime modules 5.54 KiB 8 modules
  dependent modules 100 bytes [dependent] 2 modules
  ./example.js + 2 modules 267 bytes [built] [code generated]
    [no exports]
    [no exports used]
    entry ./example.js main
chunk (runtime: main) 872.output.js 263 bytes [rendered]
  > ./lazy ./example.js 4:0-16
  dependent modules 42 bytes [dependent] 1 module
  ./lazy.js + 2 modules 221 bytes [built] [code generated]
    [exports: c, d, x, y]
    import() ./lazy ./example.js + 2 modules ./example.js 4:0-16
webpack 5.51.1 compiled successfully
```