**Global Object and Module System**

Jokhon amra js browser er run kori tokhon amader jonno ‘window’ name ekta object available thake. Eta ekta js object jekhane oshonkho property ebong method ache.

Ekhon node js er khetre browser theke na. cz node js run korche amader machine e or server e orthat ekta different environment e. shekhane browser available thake na. so shekhane ‘window’ object o nai.

console.*log*(window);

eta likhe terminal e ‘node ind.js’ korle lekha ashe window is not defined. Ekhane ‘ind.js’ hocche file er name.

Ryan Dahl v8 engine ke ber kore niye gesilo browser theke. Pura browser ke to niye jay nai. V8 chara c++ er baki je jinish tuku she banaisilo sheta tar creation. V8 google er creation. Bakita tar creation. Shei creation er moddhe window rakhar kono dorkar nai.

Amra jani settimeout ba ei dhoroner function window er moddhe thake browser e. amra node js er moddheo settimeout pabo.

*setTimeout*(() *=>* {

  console.*log*("turza");

}, 2000);

Ekhon teminal e node ind.js likhe enter dile 2 sec por turza lekha print hoitese.

Ei settimeout function node js e kemne ashlo? Js er khetre jemne browser e ‘window’ thake temoni node js er khetre khanikta eki rokom jinish ‘global’ ache. Console.log(global) likhle amra global er jinispotro dekhte parbo. Node js er environment e jokhoni amra global kono kichu likhi (settimeout ba ei rokom kono global function ba global object) shei jinish gula amra ‘global’ theke avail korte pari. So global onekta browser er window object er moto ekta jinish.

Amra js e jokhon kono variable declare kori tokhon sheta window objecter moddhe attached hoye jay. For e.g ami console e var a = 5 declare kore jodi window.a likhe enter press kori then 5 pabo. Abar just a likhe enter press korleo 5 pabo. So amra jokhon shudhu a likhi tokhon js window.a ke chine. But node e erokom kono kaj kora jay na. ind.js flie e nicher jinish likhlam.

*var* a = 5;

console.*log*(global.a);

terminal e node ind.js kore undefined pailam. So a global er moddhe jaitese na. keno jaitese na? q1

Ind.js file e nicher code likhe terminal e output dekhlam.

console.*log*(\_\_dirname);

console.*log*(\_\_filename);

ekhane \_\_dirname ind.js file ta je directory path e ache shei path name ta diye dey. Ar \_\_filename path name er shathe file er namo diye dey.

Ei \_\_dirname, \_\_filename ‘global’ er moddhe nai. Then egula ashtese kottheke? q2

Q1 ,q2 er answer ektu pore khujbo.

‘Nodejs Practice’ folder er moddhe index.html, script1.js, script2.js file nilam. Index.html er moddhe script1 ebong script2 ke attach kore dilam.

Script1.js file e var a = 5 nilam.

Script2.js file e b = 10 niye console.log(a+b) korlam. o/p e 15 dekhacche.

Orthat jodio a variable ta script2.js er kono variable na tarporo script2.js theke shetake access kora jacche.

Ekhon script2.js e var a = 25 nilam. Dekha gelo o/p change hoye 35 hoye gese. Eta ekta problem. Var er er scope er problem dur kortei let, const ashche. Var global ke pollute kore.

Jehetu Ryan Dahl nodejs e ei problem ta ante chay nai. Uni nodejs emonvabe banaise je amra jokhon ekekta js file likhi tokhon shegula prottekta individual encapsulated file. Mane ekekta file independent. Ekta file e ja likhbo ta kokhono onno ekta file access korte parbe na. ei system tai holo nodejs er moduler system. Module hocche node js er khetre ekekta .js file. Ekhon amader first module ta likhbo. Nodejs Practice folder e people.js name ekta file nilam. eta te ekta array ‘people’ define korlam.

*var* people = ["Sakib", "Tamim", "Riad"];

Erpor ind.js file e nicher code likhe terminal e o/p dekhalm.

*const* people = *require*("./people");

console.*log*(people);

o/p te ekta blank array {} ashche. Orthat people.js theke kono array ashche na. Ekhane require function tao ‘global’ e nai. Eta kivabe ashce shetao janbo.

Ekhon people.js file ta onek boro ekta module hote pare. Ete oshonkho code thakte pare. Ei file abar onno file keo import korte pare. Eta separate folder e rakha bishal ekta project o hote pare. Ei file ta nije decide kore dibe tar kon kon jinish onno file er jono accessible ba available hobe. Orthat she export korbe. Amra ind.js file e require function er maddhome import korchi.

People.js file ta te aro kichu jinish antesi.

*var* people = ["Sakib", "Tamim", "Riad"];

*var* z = 56;

*function* *test*() {

  console.*log*("Test Item");

}

module.exports = people;

ekhon ind.js e giye terminal e thik moto sakib,tamim,riad er array ta dekhaitese.

People.js console.log(module) kore node people kore terminal e dekhlam module holo ekta object. Ei object e id, path, exports etc property ache. Exports property ta by default ekta blank object. So module.exports = people korar age ei default value ta pacchilam.

Ei ‘module’ word ta ashche kottheke? eta ke access korte partesi kivabe? Eta to global er moddhe nai. Ryan Dahl nodejs bananor shomoy only v8 engine ta ke ber niye eshechen ja js code pore machine code e convert korte pare. Kintu baki environment ta kintu take nije theke create korte hoise. Js er kintu kono moduler system nai. But ei modularity achieve korte iffy use kora jay. Iffy simple ekta function ja nijei nijeke call kore.

(*function*(){

})

Ryan Dahl ei iffy ke kaje lagaise ei module system ta create korte. Ei iffy er vitore kono variable define korle sheta baire accessible hoy na. cz sheta global e attached hoye jay na. cz var holo function scoped. Sheta function er moddhei limited thake. So baire likhe amra jokhon kono kichu ke iffy er moddhe likhe dei tokhon sheta encapsulated hoye jay. Ryan ei module pattern ta ke default kore diyechen node js er khetre.

Node js environment e ekta js file e amra ja code likhi shobtai ekta iffy er moddhe chole jay just like below

(*function*(){

*var* people = ["Sakib", "Tamim", "Riad"];

*var* z = 56;

*function* *test*() {

  console.*log*("Test Item");

}

module.exports = people;

})

Invisibly node js eta kore dey. Ei iffy function ta ke node er module wrapper function bola hoy. Ei iffy function er moddhe parameter hishebe exports, require, module, \_\_filename, \_\_dirname pass kore den.

(*function*(*exports*, *require*, *module*, *\_\_filename*, *\_\_dirname*){

*var* people = ["Sakib", "Tamim", "Riad"];

*var* z = 56;

*function* *test*() {

  console.*log*("Test Item");

}

module.exports = people;

*return* module.exports;

})

Jehetu amader lekha code ta ekta invisible wrapper function er moddhe ache ebong shei function er parameter moddhe ullekhito jinish gula ache shehetu amra oi shobgula file er moddhe access korte pari.

Jokhon amra ind.js er moddhe require(‘./people’) korlam tokhon invisibly iffy er sheshe module.exports ta ke returned hocche.

Ekhon people.js theke amra multiple jinish export korte chai. Tahole module.exports = {

….things we want to export

}

People.js ……

*var* people = ["Sakib", "Tamim", "Riad"];

*var* z = 56;

*function* *test*() {

  console.*log*("Test Item");

}

module.exports = {

  p1: people,

  z1: z,

  t1: test,

};

Ind.js …….

*const* people2 = *require*("./people");

console.*log*(people2.p1);

console.*log*(people2.z1);

people2.*t1*();

terminal…

[ 'Sakib', 'Tamim', 'Riad' ]

56

Test Item

Module basically 3 dhoroner hobe. 1) amader banano kono js file like people.js

2) npm install diye niye asha kon external module like the lodash we required in previous tutorial.

3) node js er kichu default module

People.js…..

*var* people = ["Sakib", "Tamim", "Riad"];

*var* z = 56;

*function* *test*() {

  console.*log*("Test Item");

}

module.exports = people;

ind.js ….

*const* people2 = *require*("./people");

*const* \_ = *require*("lodash");

console.*log*(\_.*last*(people2));

terminal …..

riad