Back-End Development

Exploring

#4 Node Package Manager

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Node Package Manager

NPM is the package manager for JavaScript. Basically it's just a bunch of tools which will help the developers to use 3rd party packages/modules, for building their application easily.

npmjs.com

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Package

Package is a file/directory that is described by a *package.json*, including:

1. A folder containing a program described by a *package.json* file,
2. A gzipped tarball containing **(1.)**,
3. A url that resolves to **(2.)**,
4. A *<name>@<version>* that is published on the registry with **(3.)**,
5. A *<name>@<tag>* that points to **(4.)**,
6. A *<name>* that has latest tag satisfying **(5.)**,
7. A *git* url that, when cloned, results in **(1.)**.

Modules

Module is anything that can be loaded with *require()* in an NodeJS program, including:

- A folder with a *package.json* file containing a main field,
- A folder with an *index.js* file in it, or
- Just a JavaScript file.

Note: **Most NPM packages are modules!**

NPM Packages/Modules

NPM has hundreds of packages/modules which you can use easily.

- angular
- bluebird
- body-parser
- chalk
- commander
- config
- express
- ejs
- jest
- jshint
- lodash
- lru-cache
- meddleware
- nodemon
- node-static
- nodeUtils
- path
- pluralize
- request
- serve-favicon
- table
- typescript
- ***etc...***

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Getting Started

On terminal (at your dir project), type:

- **npm -v**
  check the version of installed npm.

- **npm init**
  set package, make a **package.json** *file.*
  package.json *is a JSON file that contains lot of informations about our app & keeps track which package/modules we used.*
  *** similar to our medical records, right? :)**

- **npm install namaPackage --save**
  install an NPM package/module (**npm i**).

- **npm install**
  install packages that written in **package.json**

JS dua.js | {} package.json | <> satu.html | JS satu.js

```
{
  "name": "Lin",
  "version": "1.0.0",
  "description": "Uji coba",
  "main": "dua.js",
  "scripts": {
    "test": "echo \"Error: no test specified\" && exit 1"
  },
  "keywords": [
    "Lintang"
  ],
  "author": "Lintang Wisesa",
  "license": "ISC"
}
```

package.json

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL 1: cmd

```
D:\zzz>npm -v
3.10.10

D:\zzz>npm init
This utility will walk you through creating a package.json file.
It only covers the most common items, and tries to guess sensible defaults.

See `npm help json` for definitive documentation on these fields
and exactly what they do.

Use `npm install <pkg> --save` afterwards to install a package and
save it as a dependency in the package.json file.
```

Ln 12, Col 30 Spaces: 2 UTF-8

Chalk

- Install Chalk
  `npm install chalk`

- Install chalk & update package.json
  `npm install chalk --save`

More info: *github.com/chalk/chalk*

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Chalk

#1 Base Color

```
const chalk = require('chalk');

console.log(chalk.red('Ini Merah'));
console.log(chalk.yellow('Ini Kuning'));
console.log(chalk.green('Ini Hijau'));
console.log(chalk.blue('Ini Biru'));
```

```
D:\zzz\lin_backend>node 0
Ini Merah
Ini Kuning
Ini Hijau
Ini Biru
```

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Chalk
#2 Keyword

```
const chalk = require('chalk');

console.log(chalk.keyword('orange')('Hai 1'));
console.log(chalk.keyword('purple')('Hai 2'));
console.log(chalk.keyword('cyan')('Hai 3'));
console.log(chalk.keyword('gold')('Hai 4'));
console.log(chalk.keyword('magenta')('Hai 5'));
```

```
D:\zzz\lin_backend>node 0
Hai 1
Hai 2
Hai 3
Hai 4
Hai 5
```

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Chalk

#3 RGB & HEX

```
const chalk = require('chalk');
console.log(chalk.rgb(255,0,0)('RGB 1'));
console.log(chalk.rgb(0,255,0)('RGB 2'));
console.log(chalk.rgb(255,0,255)('RGB 3'));
console.log(chalk.hex('#0000FF')('HEX 1'));
console.log(chalk.hex('#FF0000')('HEX 2'));
console.log(chalk.hex('#808000')('HEX 3'));
```

```
D:\zzz\lin_backend>node 0
RGB 1
RGB 2
RGB 3
HEX 1
HEX 2
HEX 3
```

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Chalk

#4 bgColor

```
const chalk = require('chalk');

console.log(chalk.bgRed('Halo'));
console.log(chalk.bgYellow('Halo'));
console.log(chalk.bgGreen('Halo'));
console.log(chalk.bgBlue('Halo'));
```

```
D:\zzz\lin_backend>node 0
Halo
Halo
Halo
Halo
```

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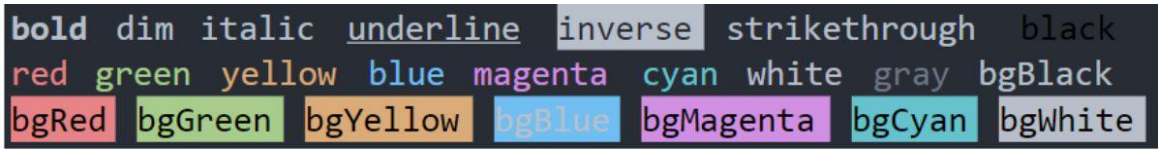

Colors

- Install Colors
  npm install colors
- Install colors & update package.json
  npm install colors --save

More info: *npmjs.com/package/colors*

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Colors
#1 Base Color

```
const colors = require('colors');
console.log(colors.red('Hello'));
console.log(colors.yellow('Hello'));
console.log(colors.green('Hello'));
console.log(colors.blue('Hello'));
console.log(colors.magenta('Hello'));
//black, cyan, white, gray, grey
```

```
D:\zzz\lin_backend>node 0
Hello
Hello
Hello
Hello
Hello
```

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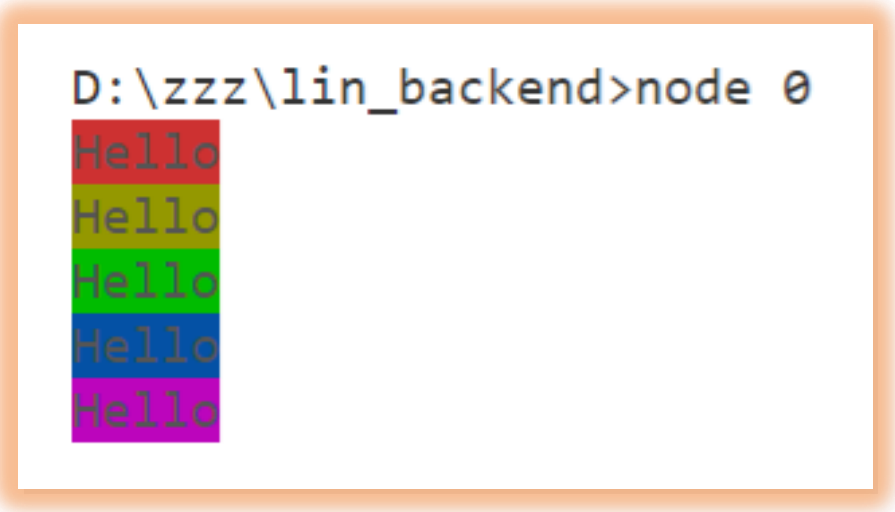
Colors
#2 bgColor

```
const colors = require('colors');
console.log(colors.bgRed('Hello'));
console.log(colors.bgYellow('Hello'));
console.log(colors.bgGreen('Hello'));
console.log(colors.bgBlue('Hello'));
console.log(colors.bgMagenta('Hello'));
//bgBlack, bgCyan, bgWhite
```



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Colors
#3 Styles

```
const colors = require('colors');
console.log(colors.bold('Hello'));
console.log(colors.rainbow('Hello'));
console.log(colors.trap('Hello'));
console.log(colors.inverse('Hello'));
console.log(colors.america('Hello'));
console.log(colors.zebra('Hello'));
```

```
D:\zzz\lin_backend>node 0
Hello
Hello
Ħěĺĺ
Hello
Hello
Hello
```

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Colors
#4 New Way

```
const colors = require('colors');
console.log('Hello'.red);
console.log('Hello'.rainbow);
console.log('Hello'.trap);
console.log('Hello'.bgYellow.black);
console.log('Hello'.america);
```

```
D:\zzz\lin_backend>node 0
Hello
Hello
HËĹĹ0
Hello
Hello
```

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Slug

It slugifies every string, even when it contains unicode! For short: make strings url-safe.

- **Install slug**
  `npm install slug`

- **Install it & update package.json**
  `npm install slug --save`

Slug
#1 Slug

```
var slug = require('slug');

var satu = slug('NodeJS ♥ is ☢');
var dua = slug('I <3 NodeJS');

console.log(satu)
console.log(dua)
```

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Slug
#2 Edit

```
var slug = require('slug');

slug.charmap['♥'] = 'am crazy of'

var tiga = slug('i ♥ nodejs', '_');
var empat = slug('I ♥ NODEJS',
{lowercase: false})

console.log(tiga)
console.log(empat)
```

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Moment

Moment is a NPM module to parse, validate, manipulate, and display dates and times in JavaScript. (see *momentjs.com*)

- **Install moment**
  npm install moment

- **Install moment & update package.json**
  npm install moment --save

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Moment

#1 Now

```
const moment = require('moment');

var now1 = moment();
var now2 = moment().format();
var now3 = moment().format("ddd, hA");
var now4 = moment().format
("dddd, MMMM Do YYYY, h:mm:ss a");

console.log(now1);
console.log(now2);
console.log(now3);
console.log(now4);
```

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Moment

#2 fromNow & toNow

```
const moment = require('moment');

var w = moment([2007]).fromNow();
var x = moment([2007, 0, 29]).fromNow(true);
var y = moment([2007]).toNow();
var z = moment([2007, 0, 29]).toNow(true);

console.log(w);
console.log(x);
console.log(y);
console.log(z);
```

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Moment

#3 a-to-z

```
const moment = require('moment');

var a = moment([2007, 2, 27]);
var b = moment([2007, 0, 29]);

console.log(a.to(b));
console.log(a.to([2007, 1, 27]));
console.log(a.to(new Date(2007, 3, 6)));
console.log(a.to("2017-11-29"));
```

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Lo Lodash

Lodash makes JavaScript easier by taking the hassle out of working with arrays, numbers, objects, strings, etc. (see *https://lodash.com*)

Lodash's modular methods are great for (1) iterating arrays, objects, or strings, (2) testing values, and (3) creating composite functions.

- **Install lodash**
  npm install lodash

- **Install lodash & update package.json**
  npm install lodash --save or
  npm i lodash --save

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Lo

Lodash
#1 String

```
const _ = require('lodash');

console.log(_.isString(135));
console.log(_.isString('Startup'));

console.log(_.capitalize('GOOGLE'));
console.log(_.upperFirst('facebook'));
console.log(_.upperCase('alibaba'));
console.log(_.lowerFirst('TWITTER'));
console.log(_.lowerCase('YAHOO'));
```

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Lo

Lodash
#2 Number

```
const _ = require('lodash');

console.log(_.isNumber(24));
console.log(_.isNumber('Andi'));

console.log(_.add(100,2));
console.log(_.subtract(48,5));
console.log(_.multiply(2,9));
console.log(_.divide(75,3));

console.log(_.ceil(99.3));
console.log(_.floor(99.3));
```

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Lo

Lodash

#3 Array

```
const _ = require('lodash');
var x = [1,3,2,4,3,5,4,6];
var y = ['Andi', 1, 'Budi', 2];

console.log(_.isArray(x));
console.log(_.uniq(x));
console.log(_.max(x));
console.log(_.min(y));
console.log(_.sum(x));
console.log(_.reverse(y));
```

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UNDERSCORE.JS

Underscore

- **Install Underscore**
  npm install underscore

- **Install it & update package.json**
  npm install underscore --save

More info: *npmjs.com/*

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Underscore

#1a Array Mapping

```
const _ = require('underscore');
var arr = [1, 2, 3]

var x = _.map(arr, function(num){
    return num * 3;
});

console.log(x)
```

Underscore

#1b Array Mapping

```
const _ = require('underscore');
var x = [1,2,3]
var y = [4,5,6]
var z = [7,8,9]
var arr = [x, y, z]

var ok = _.map(arr, _.first);

console.log(ok)
```

Underscore

#2 Obj Mapping

```
const _ = require('underscore');
var obj = {a: 1, b: 2, c: 3}

var y = _.map(obj, function(num, key){
    return num * 3;
});

console.log(y)
```

Underscore

#3 Arr Max & Min

```
const _ = require('underscore');
var arr = [1,2,3,4,5,6]

var nilaiMax = _.max(arr);
var nilaiMin = _.min(arr);

console.log(nilaiMax)
console.log(nilaiMin)
```

UNDERSCORE.JS

Underscore

#4 Obj Max & Min

```
const _ = require('underscore');
var pns = [
     {nama:'Andi',usia:34},
     {nama:'Budi',usia:40},
     {nama:'Caca',usia:46}
]

var tertua = _.max(pns,(x)=>x.usia);
var termuda = _.min(pns,(x)=>x.usia);

console.log(tertua)
console.log(termuda)
```

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UNDERSCORE.JS

Underscore

#5 Find & Filter

```
const _ = require('underscore');

var arr = [1,2,3,4,5,6]

function genap(x) {
return x % 2 == 0
}

var findGenap = _.find(arr, genap);
var filterGenap = _.filter(arr, genap);

console.log(findGenap)
console.log(filterGenap)
```

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Yargs

Yargs helps you build interactive command line tools, by parsing arguments and generating an elegant user interface (See http://yargs.js.org).

It gives you:
(1) commands and (grouped) options,
(2) a dynamically generated help menu based on your arguments &
(3) bash-completion shortcuts for commands and options.

- **Installation**
  npm install yargs --save

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Yargs
Arg.vector

satu.js

```
var argv = require('yargs').argv;
console.log(argv.x , argv.y);
```

```
// Run script!
// node satu
// node satu  --x=4  --y=4
// node satu  -x 'Halo'  -y 'kawan'
```

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Yargs
Arg.vector

satu.js

```
const argv = require('yargs').argv
console.log(argv.usia)
if (argv.usia>=25) {
    console.log('Ingat umur, kak!')
} else {
    console.log('Enjoy your life!')
}

// Run script!
// node satu
// node satu --usia=24
// node satu -usia 31
```

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Yargs
process

satu.js

```
const argv = require('yargs').argv
var perintah = process.argv;

console.log(perintah);
console.log(perintah[3]);
console.log(argv.judul);

// Run script!
// node satu
// node satu --judul=Iron Man
// node satu daftar --judul=Iron Man
```

Nodemon

Nodemon is a tool/utility that will monitor for any changes in your source and automatically restart your server. Just use *nodemon* instead of *node* to run your code, and now your process will automatically restart when your code changes.
See https://nodemon.io.

- **Installation**
  `npm install -g nodemon`

- **Open & run source with Nodemon**
  `nodemon namaFile.js`

- **Restart**
  `rs`

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#1 Buatlah sebuah program yang saat dijalankan akan menampilkan data CPU user di console, dengan warna latar obj 1 kuning & obj 2 merah!

Gunakan module OS & Chalk!

```
D:\zzz coding\tes2>node soal1
{"model":"Intel(R) Core(TM) i7-4720HQ CPU @ 2.60GHz","speed":2594
,"times":{"user":10870375,"nice":0,"sys":6904437,"idle":201087484
,"irq":2472781}}
{"model":"Intel(R) Core(TM) i7-4720HQ CPU @ 2.60GHz","speed":2594
,"times":{"user":6988437,"nice":0,"sys":1802890,"idle":210070859,
"irq":71796}}
```

#1 Solved!

```
const os = require('os');
const chalk = require('chalk')

var dataCPU0 = JSON.stringify(os.cpus()[0]);
var dataCPU1 = JSON.stringify(os.cpus()[1]);

console.log(
chalk.bgYellow.rgb(0,0,0)(dataCPU0));
console.log(
chalk.bgRed.rgb(255,255,255)(dataCPU1));
```

```
D:\zzz coding\tes2>node soal1
{"model":"Intel(R) Core(TM) i7-4720HQ CPU @ 2.60GHz","speed":2594
,"times":{"user":10870375,"nice":0,"sys":6904437,"idle":201087484
,"irq":2472781}}
{"model":"Intel(R) Core(TM) i7-4720HQ CPU @ 2.60GHz","speed":2594
,"times":{"user":6988437,"nice":0,"sys":1802890,"idle":210070859,
"irq":71796}}
```

#2 Buatlah sebuah program yang saat dijalankan akan menampilkan data CPU user di console, dengan style obj 1 rainbow & obj 2 trap!

Gunakan module OS & Colors!

```
D:\zzz coding\tes2>node soal2
{"model":"Intel(R) Core(TM) i7-4720HQ CPU @ 2.60GHz","speed":2594
,"times":{"user":10879734,"nice":0,"sys":6917937,"idle":201466609
,"irq":2479843}}
{"ɱOɗɘĹ":"▯ÑTΣĹ(R) ©▯ŘƎ(Ŧɱ) ▯7-4720Ⱨ▯ ƇPU @ 2.60ɢⱧȥ","§ƿ▯ξɗ":2594
,"T▯ɱƎϟ":{"ƱϟξR":6995859,"Ɲ▯©ξ":0,"ϟ¥ƨ":1804484,"▯ĐĹҽ":210463812,
"▯R▯":71890}}
```

#2 Solved!

```
const os = require('os');
const colors = require('colors')

var dataCPU0 = JSON.stringify(os.cpus()[0]);
var dataCPU1 = JSON.stringify(os.cpus()[1]);

console.log(colors.rainbow(dataCPU0));
console.log(colors.trap(dataCPU1));
```

```
D:\zzz coding\tes2>node soal2
{"model":"Intel(R) Core(TM) i7-4720HQ CPU @ 2.60GHz","speed":2594
,"times":{"user":10879734,"nice":0,"sys":6917937,"idle":201466609
,"irq":2479843}}
{"MQdəĹ":"□ÑTΣĹ(R) ©□ŘƎ(ŦM) □7-4720H□ CPU @ 2.60GHz","§p□ξd":2594
,"T□MƎ4":{"U4ξR":6995859,"N□©ξ":0,"4¥2":1804484,"□ĐĹe":210463812,
"□R□":71890}}
```

#3 Buatlah sebuah program yang saat dijalankan akan menampilkan data CPU user yang memiliki user times tertinggi & terendah!

Gunakan module OS & Underscore!

```
D:\zzz coding\tes2>node soal4
{"model":"Intel(R) Core(TM) i7-4720HQ CPU @ 2.60GHz","speed":2594
,"times":{"user":11513875,"nice":0,"sys":3339375,"idle":204615265
,"irq":36250}}
{"model":"Intel(R) Core(TM) i7-4720HQ CPU @ 2.60GHz","speed":2594
,"times":{"user":6115734,"nice":0,"sys":1956796,"idle":211395984,
"irq":34750}}
```

#3 Solved!

```
const colors = require('colors')
const os = require('os')
const _ = require('underscore');

var data = os.cpus();
var tertinggi = _.max(data,(x)=>x.times.user);
var terendah = _.min(data,(x)=>x.times.user);

console.log(colors.bgGreen(JSON.stringify(tertinggi)));
console.log(colors.bgRed(JSON.stringify(terendah)));
```

```
D:\zzz coding\tes2>node soal4
{"model":"Intel(R) Core(TM) i7-4720HQ CPU @ 2.60GHz","speed":2594
,"times":{"user":11513875,"nice":0,"sys":3339375,"idle":204615265
,"irq":36250}}
{"model":"Intel(R) Core(TM) i7-4720HQ CPU @ 2.60GHz","speed":2594
,"times":{"user":6115734,"nice":0,"sys":1956796,"idle":211395984,
"irq":34750}}
```

#4 Buatlah sebuah program yang saat dijalankan di terminal dengan parameter sebuah angka, dapat menentukan angka yang diinput user tersebut tergolong genap atau ganjil!

Gunakan module Yargs!

```
D:\zzz coding\tes2>node soal3 --x=26
Angka 26 itu GENAP!

D:\zzz coding\tes2>node soal3 --x=11
Angka 11 itu GANJIL!
```

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#4 Solved!

```
const colors = require('colors')
const argv = require('yargs').argv

if (argv.x % 2 == 0) {
console.log
(colors.bgGreen(`Angka ${argv.x} itu GENAP!`))
}
else {
console.log
(colors.bgMagenta(`Angka ${argv.x} itu GANJIL!`))
}
```

```
D:\zzz coding\tes2>node soal3 --x=26
Angka 26 itu GENAP!

D:\zzz coding\tes2>node soal3 --x=11
Angka 11 itu GANJIL!
```

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