

PRAKTIKUM 03: UNIT TESTING DENGAN PHPUNIT

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TUJUAN PEMBELAJARAN

Mahasiswa memahami dasar-dasar pengujian sistem pada komponen sistem

Mahasiswa memahami pengujian komponen sistem

Mahasiswa memahami dan menerapkan pengujian unit/unit testing yang merupakan bagian dari komponen sistem

Mahasiswa memahami dan menerapkan unit testing dengan PHPUnit



REFERENSI

Link Penting

<https://phpunit.de/>

<https://phpunit.readthedocs.io/en/9.3/index.html>

<https://netbeans.apache.org/download/index.html>

<https://pear.php.net/manual/en/installation.getting.php>

<https://github.com/arseto/php-test-example>

<https://www.codepolitan.com/belajar-unit-testing-dengan-phpunit>

<https://www.petanikode.com/php-composer/>

Buku Referensi PHPUnit

Bergmann, S., 2005. *PHPUnit Pocket Guide: Test-Driven Development in PHP*. " O'Reilly Media, Inc."

BASIC ILMU PENGETAHUAN

1. PHP Programming Language
2. Object Oriented Programming (OOP)
3. CLI Command Windows / Linux
4. Composer

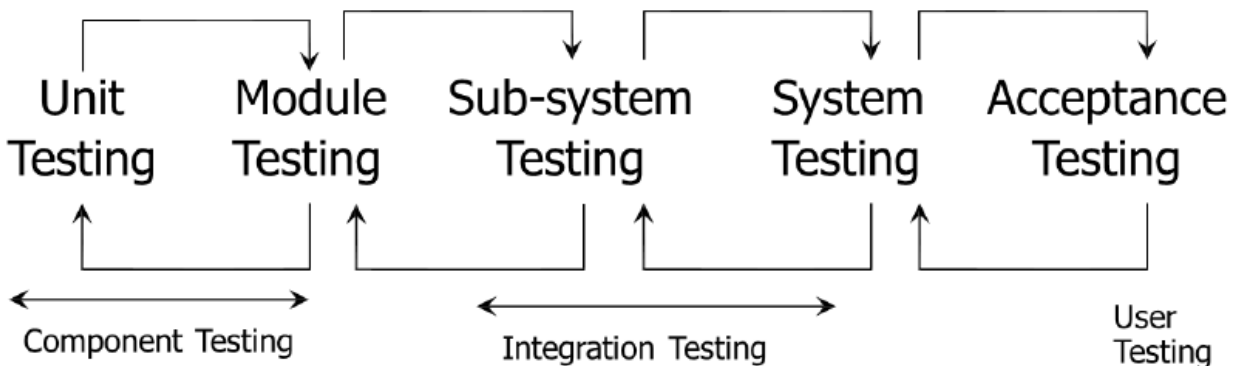
Composer is an *application-level package manager* for the *PHP Programming Language* that provides a standard format for managing dependencies of PHP software and required *libraries*. (Wikipedia)

MATERI

Pengertian *Unit Testing*

Adrian Kuhn et. al.:

Unit Tests are primarily written as a good practice to help developers identify and fix bugs, to refactor code and to serve as documentation for a unit of software under test. To achieve these benefits, unit tests ideally should cover all the possible paths in a program. One unit test usually covers one specific path in one function or method. However a test method is not necessarily an encapsulated, independent entity. Often there are implicit dependencies between test methods, hidden in the implementation scenario of a test.



PHPUnit merupakan salah satu *tools* yang dibutuhkan untuk melakukan *unit testing* di PHP. Library yang ada cukup lengkap mulai dari *assertion* dan *mocking*. Setupnya sendiri cukup mudah dengan menggunakan *tools composer*.

PRAKTIKUM

A. Instalasi Composer pada Windows

Composer adalah program untuk manajemen project PHP. Composer digunakan untuk

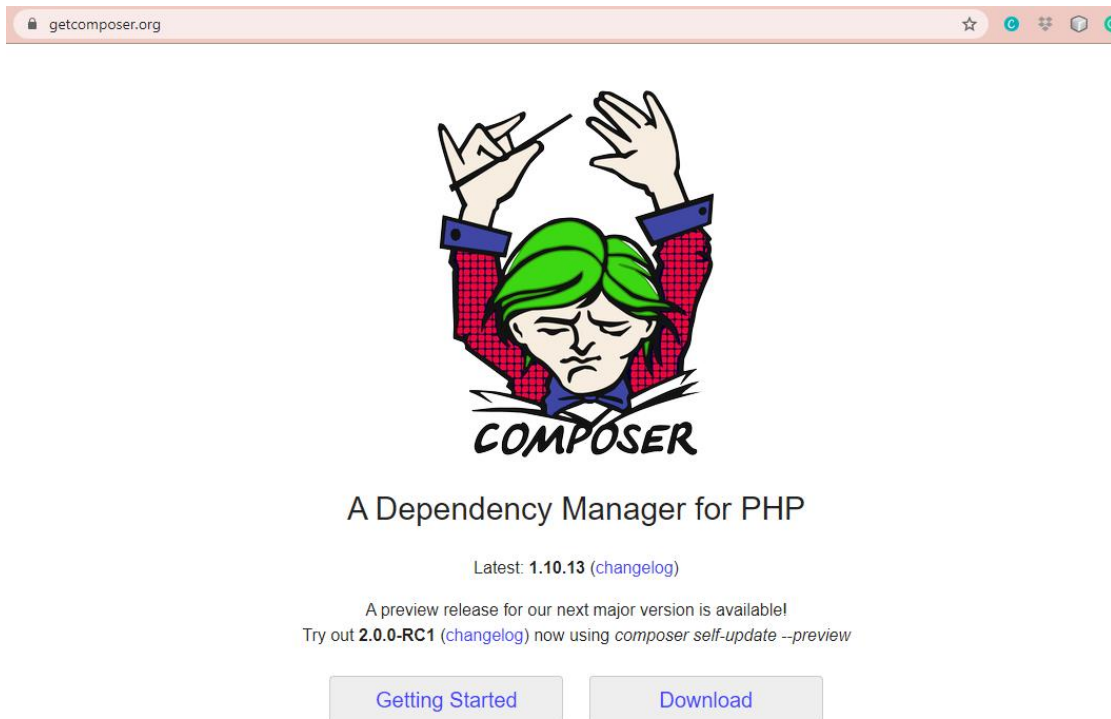
- Menginstal library yang dibutuhkan oleh project
- Menjalankan sebuah script
- Melakukan testing

Note:

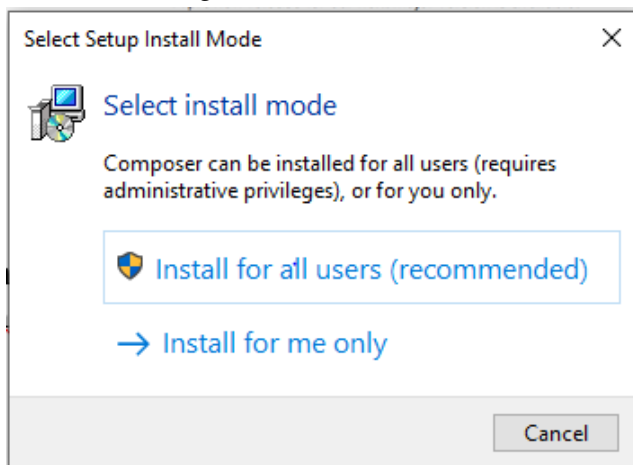
- Proses Instalasi membutuhkan koneksi internet, pastikan PC/Laptop yang digunakan terkoneksi dengan internet.
- Pastikan PC/Laptop memiliki XAMPP yang sudah terinstall (XAMPP versi terbaru atau PHP versi terbaru).

1. Download dan eksekusi file Composer-Setup.exe

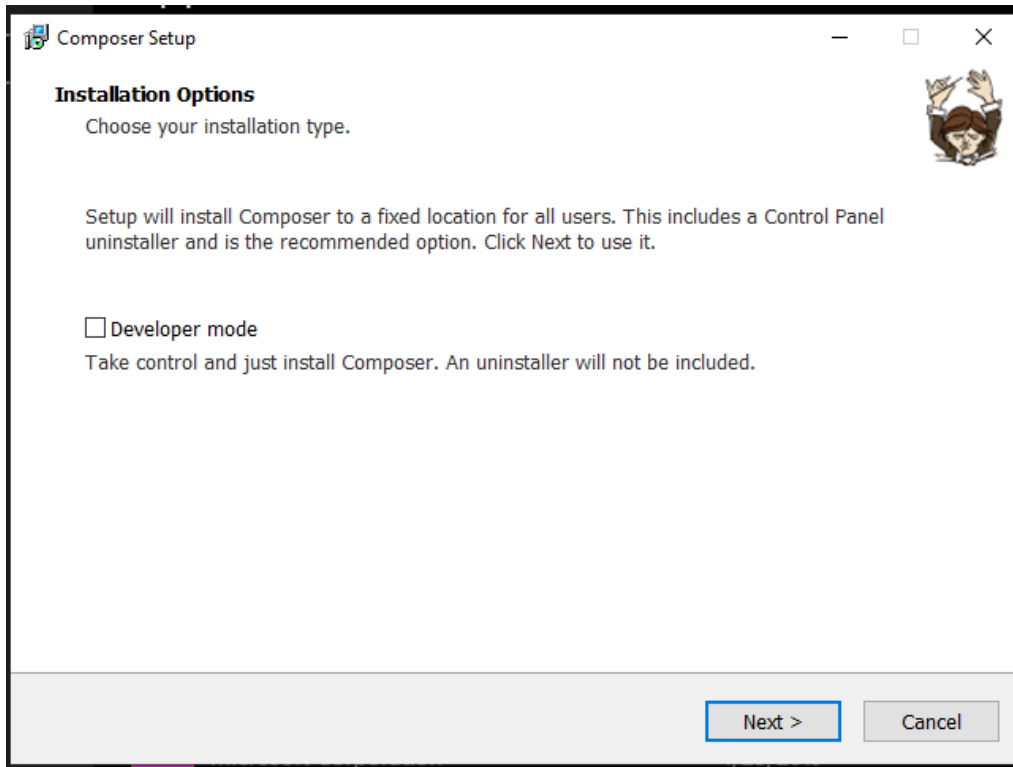
Link download : <https://getcomposer.org/download/>



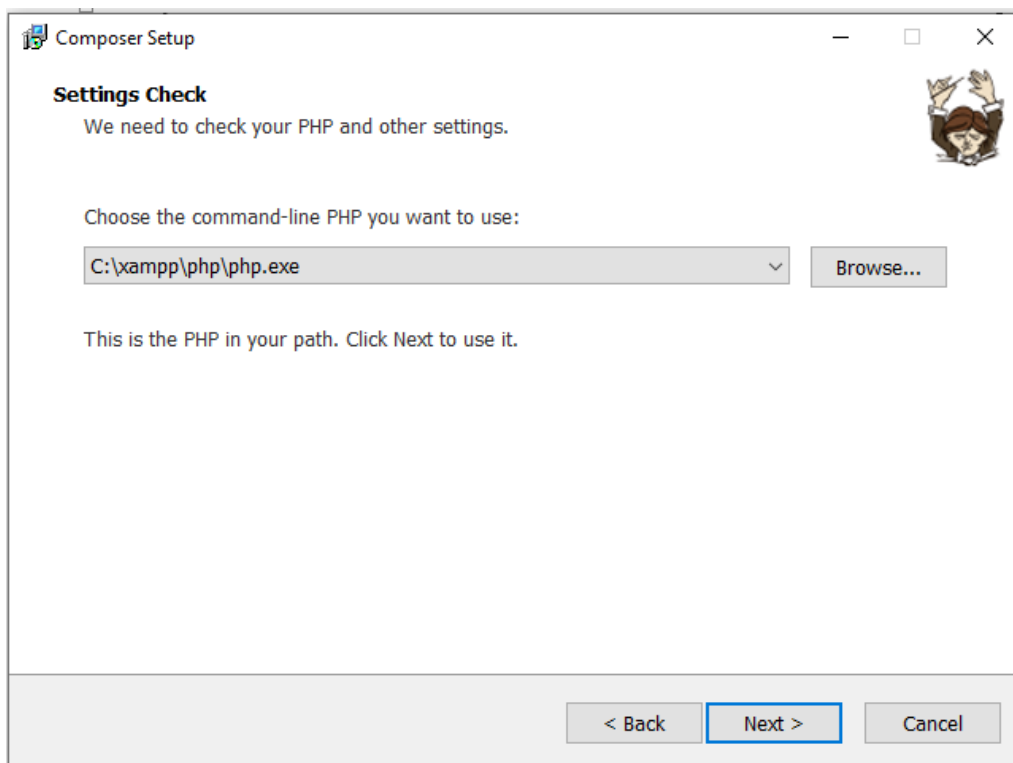
2. Pertama window setup install mode Composer akan terbuka, silahkan klik **install for all users** untuk melanjutkan:



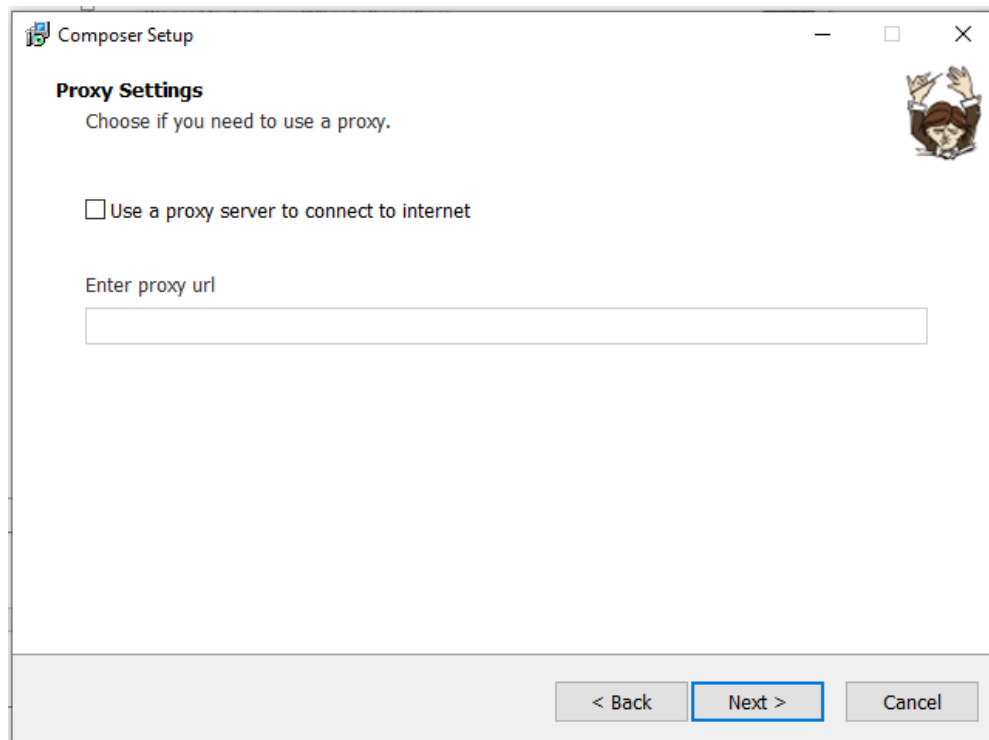
3. Kemudian akan muncul window composer setup, klik **next** untuk melanjutkan



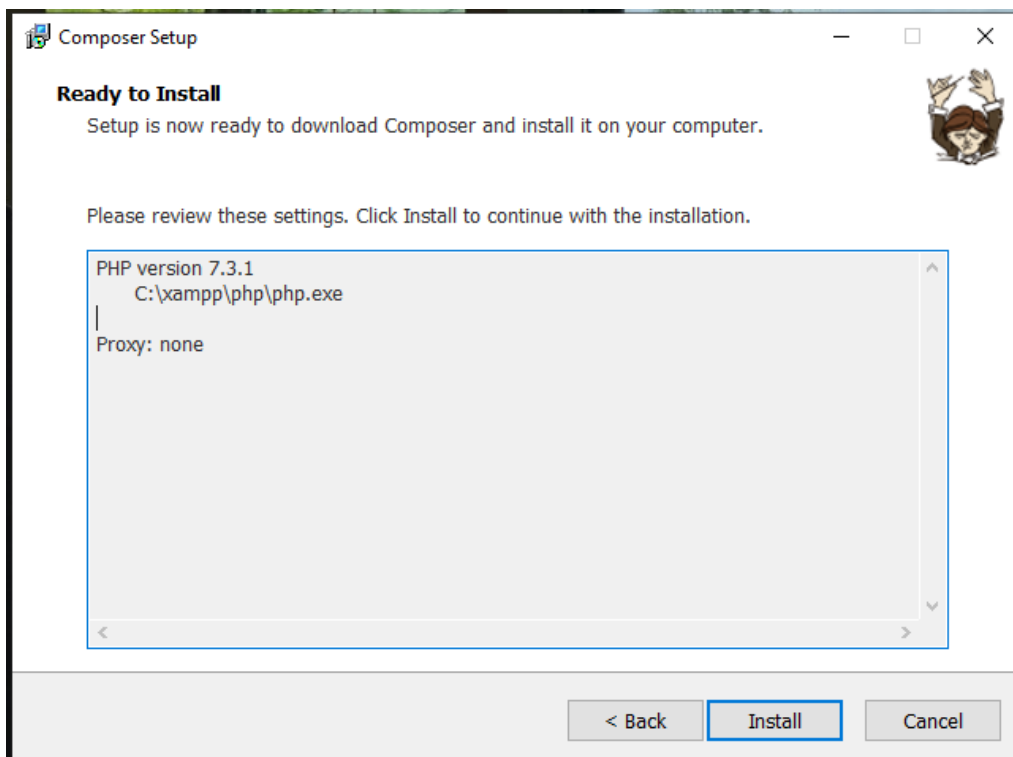
4. Composer akan mendeteksi lokasi `php.exe` yang terinstal. Jika kita menggunakan XAMPP, biasanya lokasinya berada di `C:\xampp\php\php.exe`



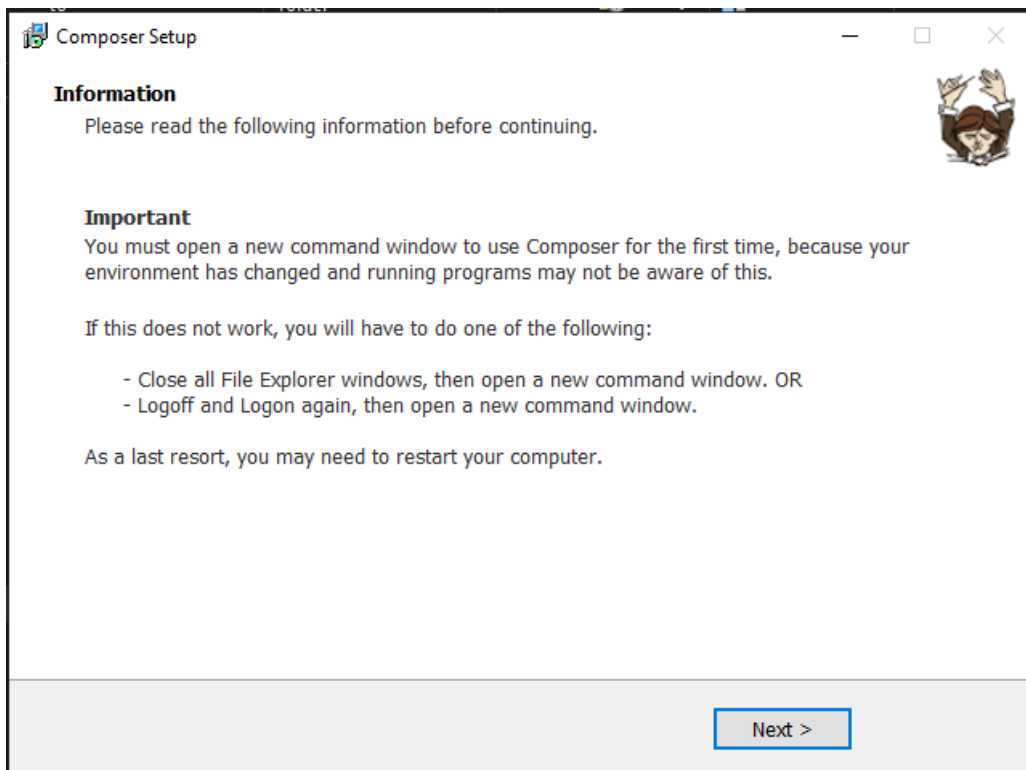
5. Selanjutnya, menentukan proxy untuk mendownload Composer. Jika kita menggunakan proxy, maka silahkan mengisi proxy disini. Tapi, kalau tidak menggunakan proxy, dibiarkan kosong.. kemudian klik **next**



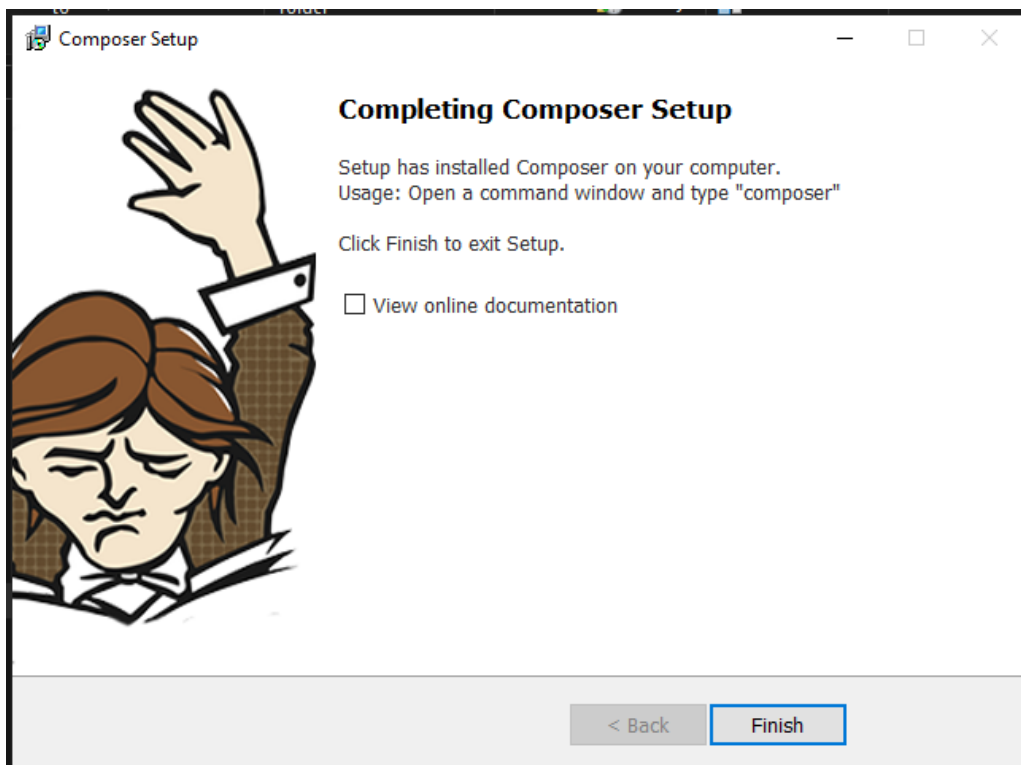
6. Review Setting: review konfigurasi composer yang akan diinstal, silahkan klik **Install** untuk memulai instalasi.



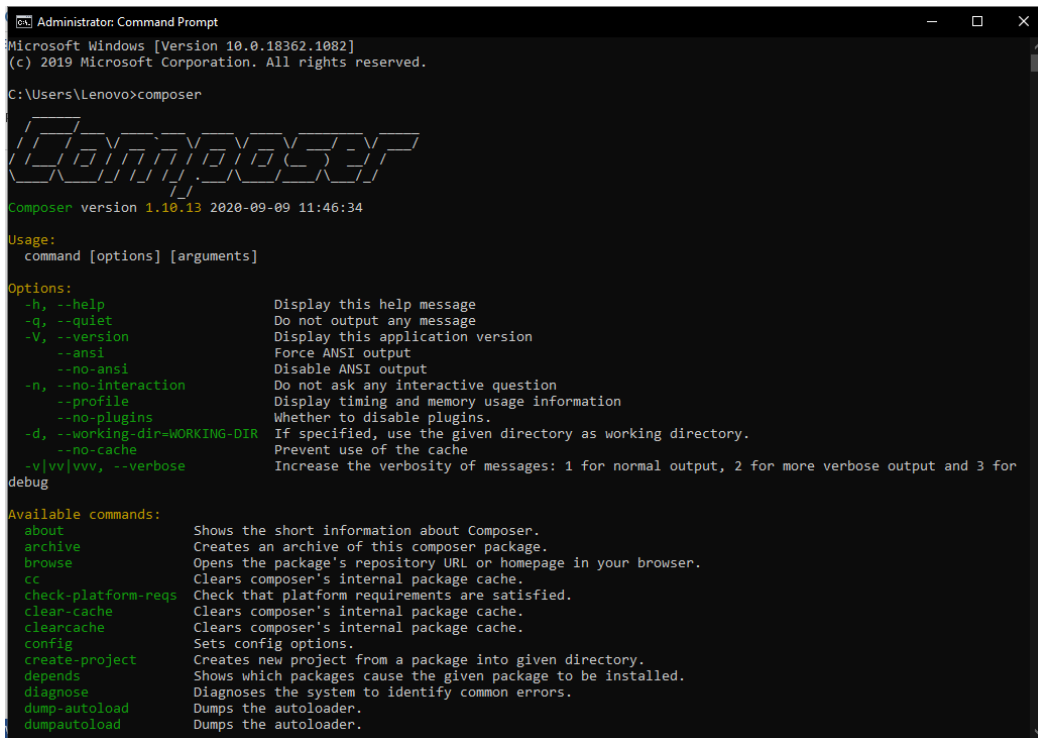
7. Perlu diingat bahwa untuk menggunakan Composer pertama kalinya, buka window *command prompt* baru. Klik **next** untuk menyelesaikan instalasi.



8. Klik **finish** untuk menyelesaikan instalasi.



9. Untuk memastikan apakah Composer sudah terinstal dengan benar, coba buka CMD dan ketik perintah **composer**



```
Administrator: Command Prompt
Microsoft Windows [Version 10.0.18362.1082]
(c) 2019 Microsoft Corporation. All rights reserved.

C:\Users\Lenovo>composer

Composer version 1.10.13 2020-09-09 11:46:34

Usage:
  command [options] [arguments]

Options:
  -h, --help                Display this help message
  -q, --quiet               Do not output any message
  -V, --version             Display this application version
      --ansi                Force ANSI output
      --no-ansi            Disable ANSI output
  -n, --no-interaction      Do not ask any interactive question
      --profile            Display timing and memory usage information
      --no-plugins          Whether to disable plugins.
  -d, --working-dir=WORKING-DIR If specified, use the given directory as working directory.
      --no-cache            Prevent use of the cache
  -v|vv|vvv, --verbose      Increase the verbosity of messages: 1 for normal output, 2 for more verbose output and 3 for
debug

Available commands:
  about          Shows the short information about Composer.
  archive        Creates an archive of this composer package.
  browse         Opens the package's repository URL or homepage in your browser.
  cc             Clears composer's internal package cache.
  check-platform-reqs Check that platform requirements are satisfied.
  clear-cache    Clears composer's internal package cache.
  clearcache     Clears composer's internal package cache.
  config         Sets config options.
  create-project Creates new project from a package into given directory.
  depends        Shows which packages cause the given package to be installed.
  diagnose       Diagnoses the system to identify common errors.
  dump-autoload  Dumps the autoloader.
  dumpautoload   Dumps the autoloader.
```

B. Instalasi PHPUnit

1. Membuat sebuah folder dengan nama **latihan-php-unit** dengan perintah **mkdir**. Jika sudah, silahkan masuk ke direktori latihan tersebut dengan commad prompt masing-masing dengan perintah **cd**. Bagi yang menggunakan GUI/Window, silahkan masuk ke folder tersebut dengan mengkliknya.

D:\#Semester Ganjil 2020\Bahan Ajar\Praktikum RPL>mkdir latihan-php-unit

2. Kemudian ketik perintah **composer init** untuk melakukan inisialisasi composer.

```
Administrator Command Prompt
Microsoft Windows [Version 10.0.18362.1082]
(c) 2019 Microsoft Corporation. All rights reserved.

C:\Users\Lenovo>d:

D:\>cd D:\#Semester Ganjil 2020\Bahan Ajar\Praktikum RPL\latihan-php-unit
D:\#Semester Ganjil 2020\Bahan Ajar\Praktikum RPL\latihan-php-unit>composer init

Welcome to the Composer config generator

This command will guide you through creating your composer.json config.

Package name (<vendor>/<name>) [lenovo/latihan-php-unit]: lenovo/latihan-php-unit
Description []: Hanya untuk latihan composer dan unit testing dengan php unit
Author [, n to skip]: Nurul Firdaus <nurul.firdaus@staff.uns.ac.id>
Minimum Stability []:
Package Type (e.g. library, project, metapackage, composer-plugin) []: project
License []: GPL

Define your dependencies.

Would you like to define your dependencies (require) interactively [yes]? NO
Would you like to define your dev dependencies (require-dev) interactively [yes]? NO

{
  "name": "lenovo/latihan-php-unit",
  "description": "Hanya untuk latihan composer dan unit testing dengan php unit",
  "type": "project",
  "license": "GPL",
  "authors": [
    {
      "name": "Nurul Firdaus",
      "email": "nurul.firdaus@staff.uns.ac.id"
    }
  ],
  "require": {}
}

Do you confirm generation [yes]? YES
```

Perintah di atas akan menghasilkan file **composer.json** dibawah ini

```
1 {
2     "name": "lenovo/latihan-php-unit",
3     "description": "Hanya untuk latihan composer dan unit testing dengan php unit",
4     "type": "project",
5     "license": "GPL",
6     "authors": [
7         {
8             "name": "Nurul Firdaus",
9             "email": "nurul.firdaus@staff.uns.ac.id"
10        }
11    ],
12    "require": {}
13 }
14
```

3. Install PHPUnit dengan perintah **composer require --dev phpunit/phpunit** atau **composer require phpunit/phpunit**

D:\#Semester Ganjil 2020\Bahan Ajar\Praktikum RPL\latihan-php-unit>composer require --dev phpunit/phpunit

Jika dibuka folder **latihan-php-unit** sekarang akan terisi file **composer.json**, **composer.lock** beserta **folder vendor**. Sampai sini kita sudah berhasil menginstall PHP Unit.


```
Administrator: Command Prompt
Microsoft Windows [Version 10.0.18362.1082]
(c) 2019 Microsoft Corporation. All rights reserved.

C:\Users\Lenovo>cd D:\#Semester Ganjil 2020\Bahan Ajar\Praktikum RPL\latihan-php-unit

D:\#Semester Ganjil 2020\Bahan Ajar\Praktikum RPL\latihan-php-unit>composer require --dev phpunit/phpunit
No composer.json in current directory, do you want to use the one at D:\#Semester Ganjil 2020\Bahan Ajar\Praktikum RPL?
[Y,n]? n
Using version ^9.4 for phpunit/phpunit
./composer.json has been created
Loading composer repositories with package information
Updating dependencies (including require-dev)
Package operations: 34 installs, 0 updates, 0 removals
- Installing sebastian/version (3.0.2): Downloading (100%)
- Installing sebastian/type (2.3.0): Downloading (100%)
- Installing sebastian/resource-operations (3.0.3): Downloading (100%)
- Installing sebastian/recursion-context (4.0.3): Downloading (100%)
- Installing sebastian/object-reflector (2.0.3): Downloading (100%)
- Installing sebastian/object-enumerator (4.0.3): Downloading (100%)
- Installing sebastian/global-state (5.0.1): Downloading (100%)
- Installing sebastian/exporter (4.0.3): Downloading (100%)
- Installing sebastian/environment (5.1.3): Downloading (100%)
- Installing sebastian/diff (4.0.3): Downloading (100%)
- Installing sebastian/comparator (4.0.5): Downloading (100%)
- Installing sebastian/code-unit (1.0.7): Downloading (100%)
- Installing sebastian/cli-parser (1.0.1): Downloading (100%)
- Installing phpunit/php-timer (5.0.2): Downloading (100%)
- Installing phpunit/php-text-template (2.0.3): Downloading (100%)
```

TUGAS

1. Selanjutnya cobalah instal library Carbon, library ini menyediakan fungsi-fungsi untuk pemrosesan waktu (Date Time).

Ketik pada command prompt: **composer require nesbot/carbon -vvv**

Maka di file **composer.json**

```
1 {
2     "name": "lenovo/latihan-php-unit",
3     "description": "Hanya untuk latihan composer dan unit testing dengan php unit",
4     "type": "project",
5     "license": "GPL",
6     "authors": [
7         {
8             "name": "Nurul Firdaus",
9             "email": "nurul.firdaus@staff.uns.ac.id"
10        }
11    ],
12    "require": {
13        "phpunit/phpunit": "^9.4",
14        "nesbot/carbon": "^2.41"
15    }
16 }
```

2. Buatlah file PHP baru di direktori proyek beraniam **tes_carbon.php** dengan isi sebagai berikut. Kemudian eksekusi dengan perintah **php tes_carbon.php**

```
1 <?php
2
3 require 'vendor/autoload.php';
4
5 use Carbon\Carbon;
6
7 $sekarang = Carbon::now();
8
9 echo "Sekarang: $sekarang <br>";
10 echo "Umur saya: " . Carbon::createFromDate(2000, 1, 1)->age . "<br>";
11 echo "Besok: " . $sekarang->addDay() . "<br>";
12
13 ?>
```

Hasilnya :

Sekarang: 2020-10-15 04:11:05

Umur saya: 20

Besok: 2020-10-16 04:11:05
