Rakamin Academy

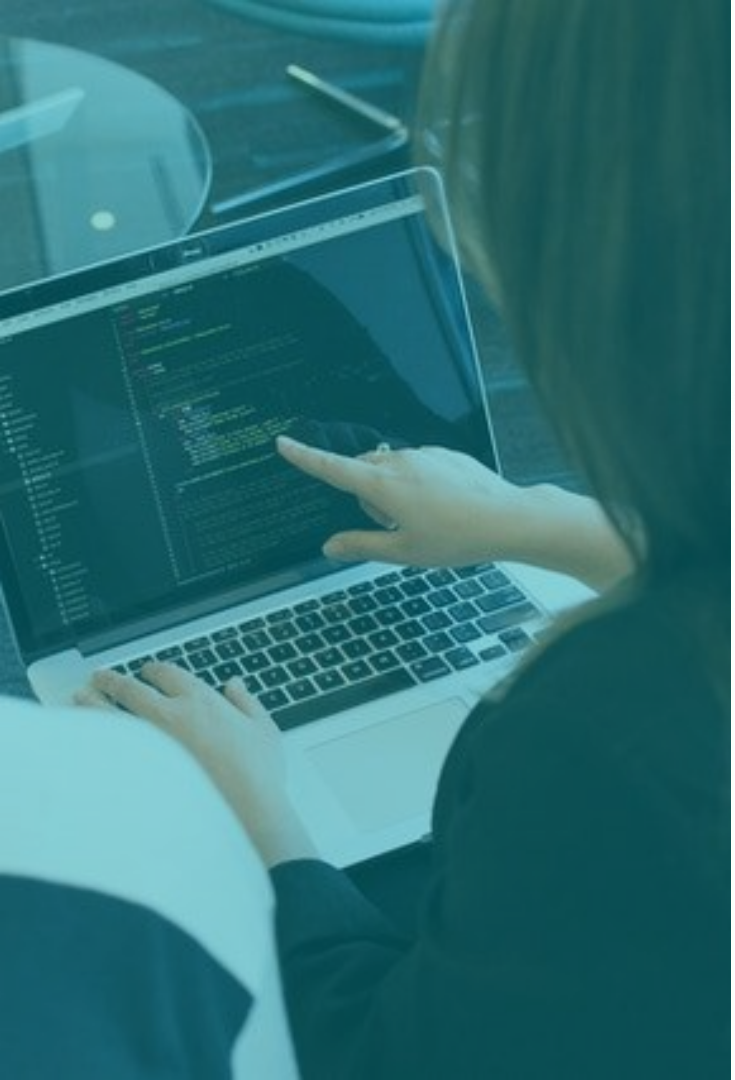
Basic Operation of API

Virtual Internship Experience

mandiri

Disclaimer

“Dokumen ini memiliki hak cipta. Barang siapa yang menyebarluaskan atau menduplikasi tanpa izin dari instansi terkait dapat diproses sesuai dengan ketentuan hukum yang berlaku.”

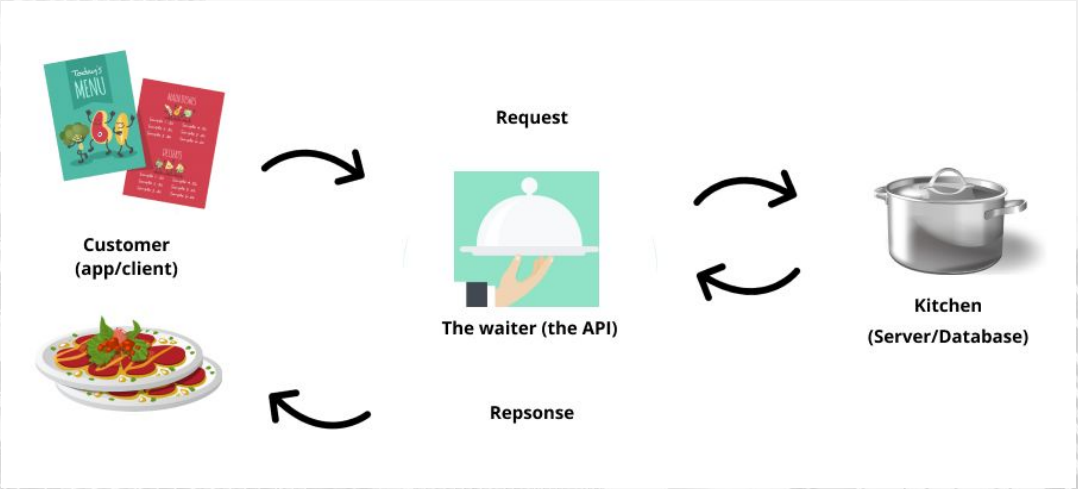


Outline

1. API
2. REST API
3. Case Study

API

- API merupakan singkatan dari Application Programming Interface.
- API digunakan antar aplikasi untuk saling berkomunikasi satu dengan yang lainnya.
- Fungsi API adalah untuk bertukar data antar aplikasi tanpa harus terhubung secara langsung.



REST API

- REST merupakan kependekan dari *REpresentational State Transfer* yang merupakan standar arsitektur berbasis web yang menggunakan protokol HTTP untuk berkomunikasi data.
- REST merupakan salah satu desain arsitektur untuk membuat API.

Metode HTTP

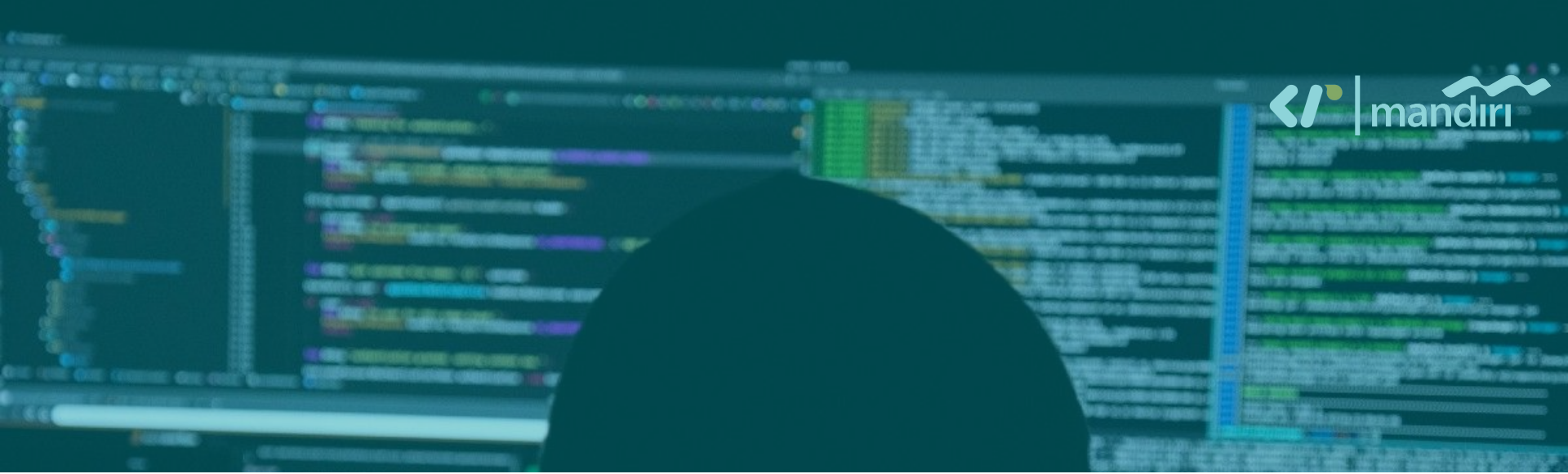
Metode HTTP yang secara umum dipakai dalam REST API adalah:

- **GET**, berfungsi untuk membaca data/resource dari REST server
- **POST**, berfungsi untuk membuat sebuah data/resource baru di REST server
- **PUT**, berfungsi untuk memperbaharui data/resource di REST server
- **DELETE**, berfungsi untuk menghapus data/resource dari REST server

Retrofit

- Retrofit adalah *library* REST-client yang sangat aman untuk Java dan Android.
- Dalam aplikasi android, Retrofit memanfaatkan OkHttp yang merupakan level rendah.
- Retrofit memiliki tiga komponen utama di dalamnya:

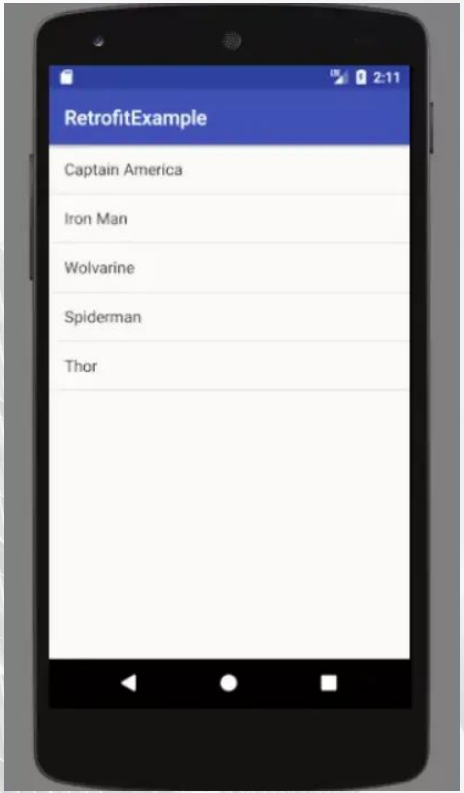
1. **Database :** Objek kelas yang dipakai untuk mendaftarkan kelas Data Access Object di mana ia nantinya berfungsi sebagai titik akses utama ke remote database atau REST API.
2. **Model :** Kelas yang dipakai untuk menyimpan suatu nilai atau data. Retrofit membutuhkan model kelas yang dipakai menyimpan data respon yang didapat berdasarkan REST API.
3. **Data Access Object (DAO) :** Antarmuka (interface) yang dipakai retrofit buat akses data berdasarkan group client ke remote database (REST API) dan memuat metode yg pada pakai buat mengakses resource-nya.



Case Study

Membuat Aplikasi Superhero menggunakan Retrofit part I

Membuat aplikasi yang menampilkan list superhero menggunakan Retrofit. Data superhero didapatkan dari API sebagai berikut :
https://simplifiedcoding.net/demos/marvel/



Membuat Aplikasi Superhero menggunakan Retrofit part I

Response API dengan format JSON :


```
[{"name":"Captain America","realname":"Steve
Rogers","team":"Avengers","firstappearance":"1941","createdby":"Joe Simon","publisher":"Marvel
Comics","imageurl":"https:\/\/www.simplifiedcoding.net\/demos\/marvel\/captainamerica.jpg","bio":"\r\n
\t\tSteven Rogers was born in the Lower East Side of Manhattan, New York City, in 1925 to poor Irish
immigrants, Sarah and Joseph Rogers.[54] Joseph died when Steve was a child, and Sarah died of
pneumonia while Steve was a teen. By early 1940, before America's entry into World War II, Rogers is a
tall, scrawny fine arts student specializing in illustration and a comic book writer and
artist.\r\n\t\t"},{"name":"Iron Man","realname":"Tony
Stark","team":"Avengers","firstappearance":"1963","createdby":"Stan Lee","publisher":"Marvel
Comics","imageurl":"https:\/\/www.simplifiedcoding.net\/demos\/marvel\/ironman.jpg","bio":"\r\n\t\tAnt
hony Edward Stark, the son of wealthy industrialist and head of Stark Industries, Howard Stark, and
Maria Stark. A boy genius, he enters MIT at the age of 15 to study electrical engineering and later
receives master's degrees in electrical engineering and physics. After his parents are killed in a car
accident, he inherits his father's company.\r\n\t\t"},{"name":"Wolvarine","realname":"James
Howlett","team":"X-Men","firstappearance":"1974","createdby":"Len Wein","publisher":"Marvel
Comics","imageurl":"https:\/\/www.simplifiedcoding.net\/demos\/marvel\/logan.jpg","bio":"\r\n\t\tWolve
rine was born James Howlett in northern Alberta, Canada, during the late 1880s, purportedly to rich
farm owners John and Elizabeth Howlett,[27] though he is actually the illegitimate son of the
Howletts' groundskeeper, Thomas Logan.[28] After Thomas is thrown off the Howletts' property for an
attempted rape perpetrated by his other son, named simply Dog, he returns to the Howlett manor and
kills John Howlett. In retaliation, young James kills Thomas with bone claws that emerge from the back
of his hands, as his mutation manifests.[29] He flees with his childhood companion, Rose, and grows
into manhood on a mining colony in the Yukon, adopting the name \"Logan\".[30] When Logan accidentally
kills Rose with his claws, he flees the colony and lives in the wilderness among wolves,[31] until he
is captured and placed in a circus.[32] Saul Creed, brother of Victor Creed, frees Logan, but after he
betrays Logan and Clara Creed to Nathaniel Essex, Logan drowns Creed in Essex's potion.[33] Logan
returns to civilization, residing with the Blackfoot people. Following the death of his Blackfoot
lover, Silver Fox, at the hands of Victor Creed, now known as Sabretooth,[34] he is ushered into the
Canadian military during World War I. Logan spends time in Madripoor before settling in Japan, where
he marries Itsu and has a son, Daken. Logan is unaware of his son for many years.\r\n\t\t"},
```



```
▼ 0:
    name:           "Captain America"
    realname:       "Steve Rogers"
    team:           "Avengers"
    firstappearance: "1941"
    createdby:      "Joe Simon"
    publisher:      "Marvel Comics"
  ▼ imageurl:       "https://www.simplifiedcoding.net/demos/marvel/captainamerica.jpg"
  ▼ bio:            "\r\n\t\tSteven Rogers was born in the Lower East Side of Manhattan, New York City, in 1925
                    to poor Irish immigrants, Sarah and Joseph Rogers.[54] Joseph died when Steve was a child,
                    and Sarah died of pneumonia while Steve was a teen. By early 1940, before America's entry
                    into World War II, Rogers is a tall, scrawny fine arts student specializing in illustration
                    and a comic book writer and artist.\r\n\t\t"
▼ 1:
    name:           "Iron Man"
    realname:       "Tony Stark"
    team:           "Avengers"
    firstappearance: "1963"
    createdby:      "Stan Lee"
    publisher:      "Marvel Comics"
  ▼ imageurl:       "https://www.simplifiedcoding.net/demos/marvel/ironman.jpg"
  ▼ bio:            "\r\n\t\tAnthony Edward Stark, the son of wealthy industrialist and head of Stark
                    Industries, Howard Stark, and Maria Stark. A boy genius, he enters MIT at the age of 15 to
                    study electrical engineering and later receives master's degrees in electrical engineering
                    and physics. After his parents are killed in a car accident, he inherits his father's
                    company.\r\n\t\t"
```

Membuat Aplikasi Superhero menggunakan Retrofit part I

Step #1 : Buat Project Android Studio baru dengan nama RetrofitExample. Kemudian tambahkan Internet Permission di Android Manifest.xml

```
<uses-permission android:name="android.permission.INTERNET"></uses-permission>
```

Step #2 : Pada file gradle tambahkan dependencies berikut ini :

```
dependencies {
    ……
  // Retrofit
  implementation 'com.squareup.retrofit2:retrofit:2.5.0'

  // GSON
  implementation 'com.squareup.retrofit2:converter-gson:2.5.0'
}
```

Membuat Aplikasi Superhero menggunakan Retrofit part I

Step #3 : Membuat model class. Sesuaikan nama variable dengan nama atribut JSON pada response!

```
data class Heroes(
      var name: String,
      var realname: String,
      var team: String,
      var firstappearance: String,
      var createdby: String,
      var publisher: String,
      var imageurl: String,
      var bio: String)
```

Atribut JSON pada response :

```
{
name: "Captain America",
realname: "Steve Rogers",
team: "Avengers",
firstappearance: "1941",
createdby: "Joe Simon",
publisher: "Marvel Comics",
imageurl: "https://www.simplifiedcoding.net/demos/marvel/captainamerica.jpg",
bio: " Steven Rogers was born in the Lower East Side..... "
}
```

Membuat Aplikasi Superhero menggunakan Retrofit part I

Step #4 : Buat layout UI pada activity utama (activity_main.xml)

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical">

    <RecyclerView
        android:id="@+id/rv_heroes"
        android:layout_width="match_parent"
        android:layout_height="match_parent" />

</LinearLayout>
```

Membuat Aplikasi Superhero menggunakan Retrofit part I

Step #5 : Buat Class untuk Instance Retrofit. Perhatikan BASE_URL!

```
class ApiClient {
    companion object {
        fun getClient() : Retrofit {
            val BASE_URL = "https://simplifiedcoding.net/demos/"
            val retrofit : Retrofit = Retrofit.Builder().
            baseUrl(BASE_URL).
            addConverterFactory(GsonConverterFactory.create())
                .build()

            return retrofit
        }
    }
}
```

https://simplifiedcoding.net/demos/marvel/

Base URL

Path Endpoint

Bersambung di part II pada Video Learning selanjutnya

Thank You!
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