

Mobile Programming (MP)

Pertemuan 12 : SharedPreferences, File Storage, dan Debugging

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Outline

Mobile Programming
(MP)

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Hirzan

Overview
Android
Storage

SharedPreferences

File Storage

Debugging
dan Testing

Lastly

1 Overview Android Storage

2 SharedPreferences

3 File Storage

4 Debugging dan Testing

5 Lastly

Overview Android Storage

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Teknik Penyimpanan Data

Android menyediakan beberapa metode penyimpanan data:

- Android Storage
 - SharedPreferences
 - Internal Storage
 - External Storage
 - SQLite
 - Room Database
 - Cloud Storage

Overview Android Storage

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Kapan Menggunakan Storage Tertentu

Data	Storage
Pengaturan aplikasi	SharedPreferences
File kecil	Internal Storage
Dokumen	External Storage
Data Relasional	Room
Sinkronisasi Online	Cloud

SharedPreferences

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SharedPreferences adalah:

- Penyimpanan key-value
- Ringan
- Persisten
- Cocok untuk konfigurasi aplikasi

Contoh

- `username = "admin"`
- `dark_mode = true`
- `font_size = 18`

Arsitektur SharedPreferences

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Lokasi:

```
/data/data/package_name/shared_prefs/
```

Kelebihan dan Kekurangan

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Kelebihan

- Mudah digunakan
- Cepat
- Cocok untuk data kecil
- Tidak memerlukan database

Keterbatasan

- Data besar
- Relasi data kompleks
- Multimedia
- Data transaksi

Pembuatan *SharedPreferences*

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Contoh Kode

```
val sharedPreferences =  
    getSharedPreferences(  
        "MyPref",  
        MODE_PRIVATE  
    )
```

Penjelasan

- MyPref = nama file
- MODE_PRIVATE = hanya aplikasi sendiri

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Contoh Kode Simpan String

```
val editor = sharedPreferences.edit()

editor.putString(
    "username",
    "admin"
)

editor.apply()
```

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Contoh Kode Simpan Integer

```
editor.putInt(  
    "score",  
    100  
)  
  
editor.apply()
```

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Contoh Kode Simpan Boolean

```
editor.putBoolean(  
    "isLogin",  
    true  
)  
  
editor.apply()
```

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Contoh Kode Baca Data

```
val username =  
    sharedPref.getString(  
        "username",  
        "guest"  
    )
```

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Contoh Kode Hapus Data

```
editor.remove(  
    "username"  
)  
  
editor.apply()
```

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Contoh Kode Hapus Semua Data

```
editor.clear()
```

```
editor.apply()
```

SharedPreferences apply() vs commit()

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apply()	commit()
Asynchronous	Synchronous
Cepat	Lebih lambat
Tidak return status	Return Boolean

Rekomendasi Industri

apply()

Alternatif: JetPack DataStore

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Google merekomendasikan: Jetpack DataStore

Keunggulan:

- Coroutine
- Flow
- Lebih aman
- Modern

File Storage

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Internal Storage

Karakteristik:

- Private
- Aman
- Terhapus saat uninstall

External Storage

Digunakan untuk:

- Foto
- Video
- PDF

Menulis File Internal

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Contoh Kode Menulis File

```
val text = "Hello Android"

openFileOutput(
    "data.txt",
    MODE_PRIVATE
).use {
    it.write(
        text.toByteArray()
    )
}
```

Membaca File Internal

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Contoh Kode Membaca File

```
val text =  
    openFileInput("data.txt")  
        .bufferedReader()  
        .readText()
```

Debugging dan Testing

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Definisi

Debugging adalah: Proses menemukan dan memperbaiki kesalahan program.

Jenis

- Syntax Error
- Runtime Error
- Logical Error

Debugging Tool

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Tool utama debugging:

Logcat

Menampilkan:

- Error
- Warning
- Informasi aplikasi

Ilustrasi

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```
Logcat: Logcat x +
Pixel XL API 31 (emulator-5554) Android 12, API 31 package:mine

2022-12-29 01:00:55.790 1639-1855 EGL_emulation com.google.samples.apps.sunflower
2022-12-29 01:01:04.770 1639-1675 .apps.sunflowe com.google.samples.apps.sunflower
2022-12-29 02:02:23.199 546-603 VerityUtils system_server
2022-12-29 02:02:23.408 22470-22470 GraphicsEnvironment com.google.samples.apps.sunflower
2022-12-29 02:02:23.408 22470-22470 com.google.samples.apps.sunflower
2022-12-29 02:02:23.402 22470-22470 NetworkSecurityConfig com.google.samples.apps.sunflower
2022-12-29 02:02:23.402 22470-22470 com.google.samples.apps.sunflower
2022-12-29 02:02:23.621 22470-22584 libEGL com.google.samples.apps.sunflower
2022-12-29 02:02:23.664 22470-22584 com.google.samples.apps.sunflower
2022-12-29 02:02:23.673 22470-22584 com.google.samples.apps.sunflower
2022-12-29 02:02:23.743 546-603 VerityUtils system_server
2022-12-29 02:02:24.327 22470-22470 .apps.sunflowe com.google.samples.apps.sunflower
2022-12-29 02:02:24.328 22470-22470 com.google.samples.apps.sunflower
2022-12-29 02:02:25.690 22470-22470 Compatibil...Reporter com.google.samples.apps.sunflower
2022-12-29 02:02:26.155 22470-22470 Choreographer com.google.samples.apps.sunflower
2022-12-29 02:02:26.579 22470-22582 HostConnection com.google.samples.apps.sunflower
2022-12-29 02:02:26.584 22470-22582 com.google.samples.apps.sunflower
2022-12-29 02:02:26.699 22470-22582 com.google.samples.apps.sunflower
2022-12-29 02:02:26.709 22470-22582 OpenGLRenderer com.google.samples.apps.sunflower
2022-12-29 02:02:26.711 22470-22582 com.google.samples.apps.sunflower
2022-12-29 02:02:26.713 22470-22582 EGL_emulation com.google.samples.apps.sunflower
2022-12-29 02:02:26.715 22470-22582 com.google.samples.apps.sunflower
2022-12-29 02:02:26.803 22470-22582 Gralloc4 com.google.samples.apps.sunflower

D app_time_stats: avg=27989792.00ms min=8.37ms max=55979576.00ms count=2
W Reducing the number of considered missed Gc histogram windows from 5000 to 100
E Failed to measure fs-verity, errno 1: /data/app/~~arQa19IZQnQgkPbxc1bMag==/com.google.samples.apps.sunflower-gPx95Scti
V ANGLE Developer option for 'com.google.samples.apps.sunflower' set to: 'default'
V Neither updatable production driver nor prerelease driver is supported.
D No Network Security Config specified, using platform default
D No Network Security Config specified, using platform default
D loaded /vendor/lib64/egl/libEGL_emulation.so
D loaded /vendor/lib64/egl/libGLESv1_CM_emulation.so
D loaded /vendor/lib64/egl/libGLESv2_emulation.so
E Failed to measure fs-verity, errno 1: /data/app/~~arQa19IZQnQgkPbxc1bMag==/com.google.samples.apps.sunflower-gPx95Scti
W Accessing hidden method Landroid/view/View;->computeFitSystemWindows(Landroid/graphics/Rect;Landroid/graphics/Rect;)Z
W Accessing hidden method Landroid/view/ViewGroup;->makeOptionalFitsSystemWindows()V (unsupported, reflection, allowed)
D Compat change id reported: 171228096; UID 10148; state: ENABLED
I Skipped 154 frames! The application may be doing too much work on its main thread.
D createUnique: call
D HostConnection:get() New Host Connection established 0x7df95262cb90, tid 22582
D HostComposition ext ANDROID_EMU_CHECKSUM_HELPER_v1 ANDROID_EMU_native_sync_v2 ANDROID_EMU_native_sync_v3 ANDROID_EMU_
W Failed to choose config with EGL_SWAP_BEHAVIOR_PRESERVED, retrying without...
W Failed to initialize 101010-2 format, error = EGL_SUCCESS
D eglCreateContext: 0x7df95262cf50: maj 3 min 0 rcv 3
D eglMakeCurrent: 0x7df95262cf50: ver 3 0 (tinfo 0x7dfb6e942080) (first time)
I napper 4.x is not supported
```

Breakpoint

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Breakpoint digunakan untuk:

- Menghentikan eksekusi
- Memeriksa nilai variabel
- Analisis program

Ilustrasi

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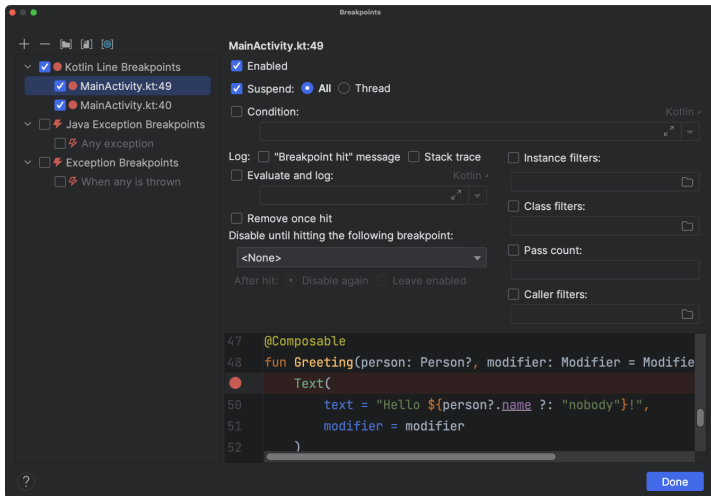
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Android Profiler

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Digunakan untuk monitoring:

- CPU
- Memory
- Network
- Energy

Ilustrasi

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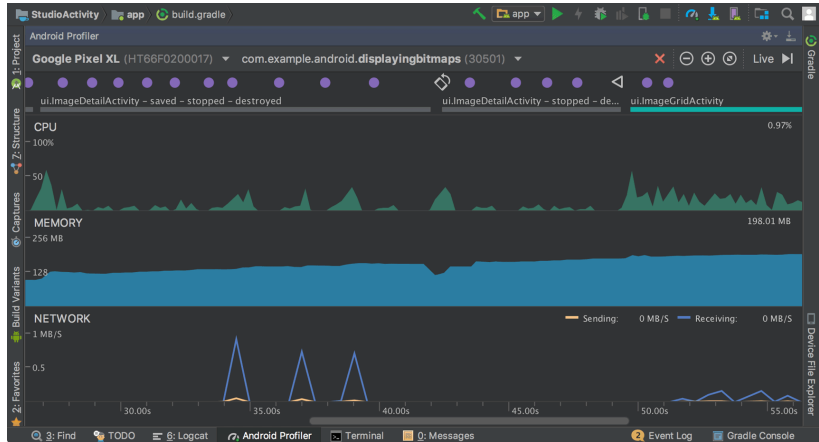
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Apa itu Testing?

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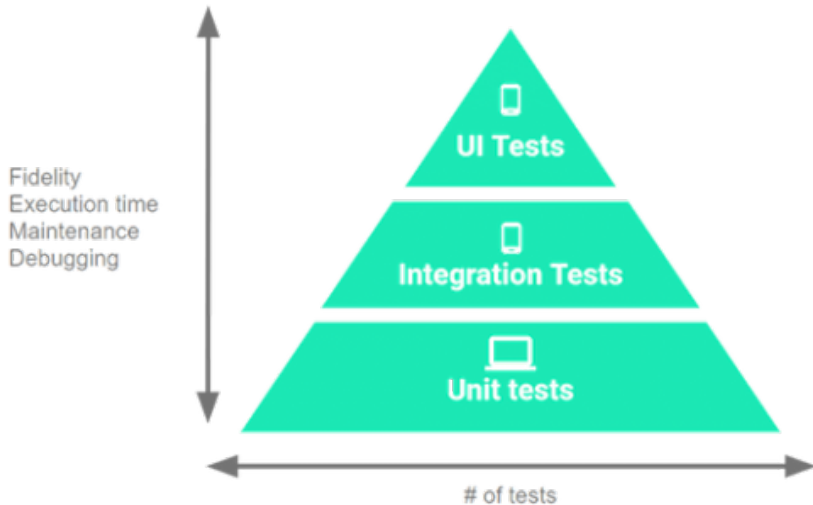
Lastly

Testing adalah proses verifikasi bahwa aplikasi bekerja sesuai kebutuhan.

Jenis

- Unit Test
 - Menguji Function, Class, dan Logic Tanpa UI
- Integration Test
 - Android menggunakan JUnit
- UI Test
 - Menggunakan Espresso Framework untuk UI Testing

Ilustrasi



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Terima Kasih