

COMP5216 Assignment Project Exam Help

Week 02

Semester 2, 2020

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Outline

- App development workflow
- How to come up with app ideas through problems ?
- Group Project
- Android Programming Basics
 - Android app d
 - Where are the <https://eduassistpro.github.io/>
 - Programming basics

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App development workflow

Six Steps

1. Define Goals
2. Analyse Requirements
3. Design UI: sketches
4. Design project structure
5. Implement codes
6. Test, debug, and release

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1. Design Goals

- Goals vs Ideas
 - Value

Value Propositions

- To meet the needs of customers/users
 - What value do we deliver to customers ?
 - Which one of cus https://eduassistpro.github.io/ to solve ?
 - What bundles of referring to each Customer Segment ?
 - Which customer needs are we satisfying Add WeChat edu_assist_pro
- In business context
 - Offerings from the product
 - What distinguishes itself from its competitors
 - Quantitative – price and efficiency
 - Qualitative – overall customer experience and outcome

2. Requirement Analyses

- How to deliver the values
 - Tasks
 - User scenarios
- How the app will function
 - Key interactions
 - Secondary functions
 - Features in the first version that a user”
- Understand the field
 - Find out whether there are other apps out there doing the same thing
- Obtain insights of the problem
 - Find design inspiration for your app
 - Find information on the technical requirement for your app
 - Find out how you can market and monetize your app

Business Model Canvas

- Proposed by business theorist Alexander Osterwalder
- A strategic management and lean startup template for developing new or documenting existing business models.
- It is a visual ~~Assignment Project Exam Help~~ canvas with elements describing a firm's or product's value proposition, customer segments, channels, , and finances.

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- <https://www.alexandercowan.com/resources/business-model-canvas-templates/>

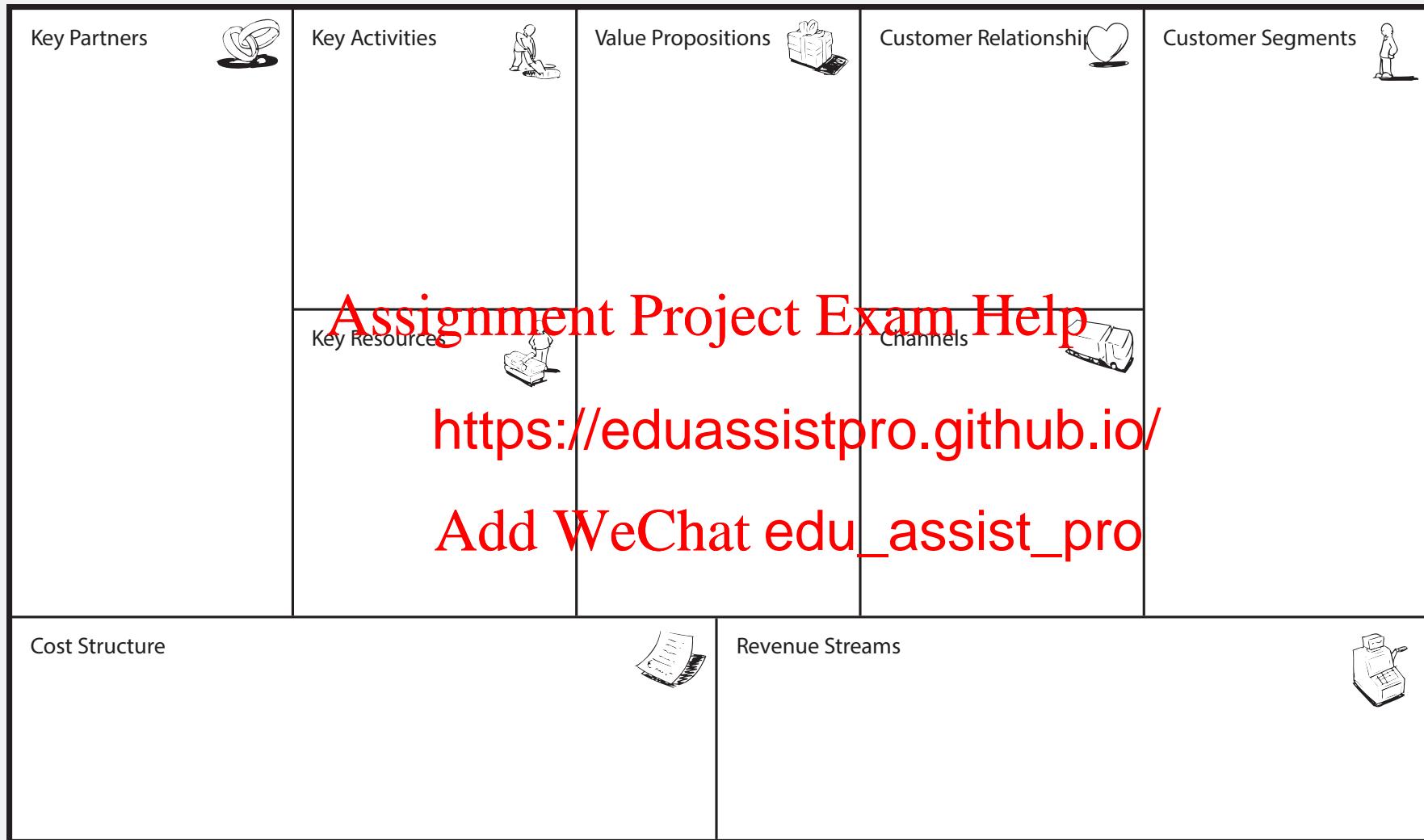
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The Business Model Canvas

Designed for:

Designed by:

On: Day Month Year
Iteration: No.



The Lean Principle

- **Entrepreneurs are everywhere**
 - There's never been a better time to innovate
 - Think big. Start small. Scale Fast
- Entrepreneurship <https://eduassistpro.github.io/>
- Validating learn
- Innovation accounting
- **Build-Measure-Learn**

Build – Measure - Learn

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Minimum Viable Product

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3. UI (User Interface)

- Platform specific UI styles

- iOS - <https://developer.apple.com/design/human-interface-guidelines/>
- Android - <https://developer.android.com/design/>

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3. UI (User Interface)

- Sketching wireframes
- Tools (not free)
 - Balsamiq - <https://balsamiq.com/>
 - Mockups- [Assignment Project Exam Help](https://balsamiq.com/)
 - HotGloo - <https://eduassistpro.github.io/>

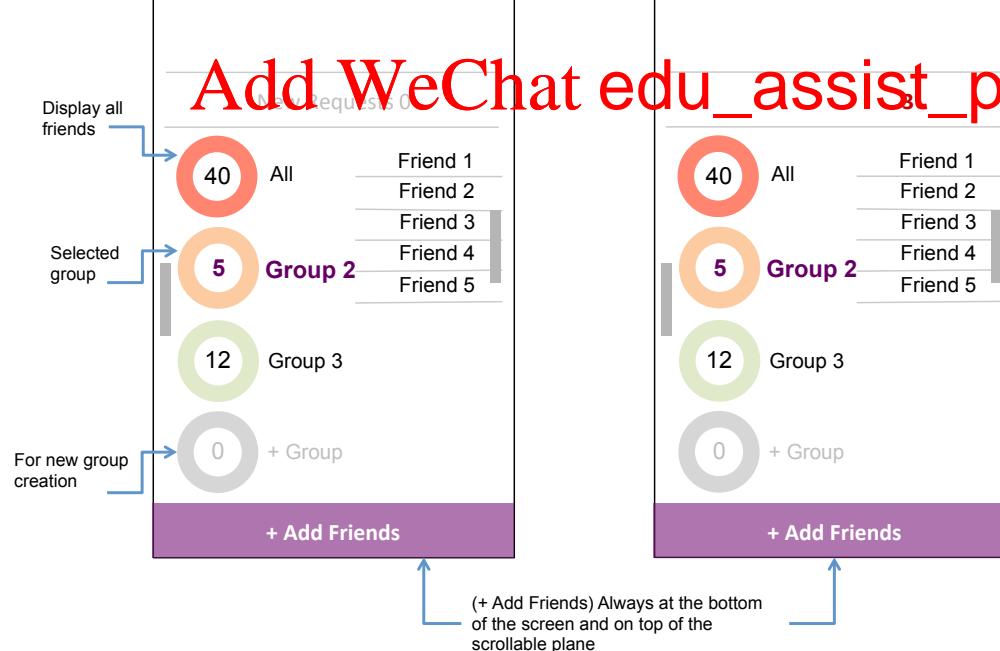
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3. UI (User Interface)

- Tools (free)
 - MS PowerPoint
 - Apple Keynote
 - Apple - <https://developer.apple.com/design/resources/>
 - Android - <https://material.io/design/introduction/#principles>

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3. UI (User Interface)

- Learn from good designs

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3. UI (User Interface)

- Test your UI on the device
 - POP - <https://marvelapp.com/pop/>
 - Balsamiq - <https://balsamiq.com/>

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4. Design Project Structure

- Frontend
 - UI implementation
 - MVC framework (Model-View-Controller)
 - MVP (Model-View-Presenter) and MVVM (Model-View-View-Model)
 - Avoid holistic placement of UI elements
- Backend
 - Use cloud service as much as possib
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- Always think about the impact of your design on other stakeholders of the eco-systems
 - Users
 - Networks
 - ...,

5. Implementing the Code

- **Mobile app development is increasingly getting easier !**
 - OS APIs
 - Web/Cloud services APIs
 - Third party SDKs
 - Third party ~~Assignment Project Exam Help~~
- Develop as a tea <https://eduassistpro.github.io/>
 - 1- Front-end, 1- Back-end, 1- UI/UX,
 - Agile software development
 - Scrum - <https://www.atlassian.com/agile>
- **Take advantage from collaborative tools**
 - Bitbucket - <https://www.bitbucket.org>
 - Github - <https://github.com>
 - Slack - <https://slack.com>

6. Testing and Debugging

- Not only functions
- But also the feedback from users, such as how they use the app
 - Verifying value propositions
 - Taking note of their actions
 - Adapting your
 - App Analytics S <https://eduassistpro.github.io/>
- **Beta version release** Add WeChat `edu_assist_pro`
 - Lets you to distribute the app to known users
- Customer development
 - Users other than your friends and family members: getting out of the building

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How to find app ideas?

Ideas



– Existing ideas

- Even if you find someone else working on the same thing, you're probably not too late.
- Worrying that you're late is one of the signs of a good idea

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– Extension to existing ideas

- Analogy between two domains
 - Airbnb vs Bike sharing
 - Facebook vs LinkedIn
- Add an extra feature
- Opposite thinking
 - Hospital vs Home health-care

– Innovative ideas

Ideas



- The way to get good ideas is not to try to think of your assignment
 - The most common mistake startups make is to solve problems no one has
 - It yields bad ideas that sound plausible enough to fool you into working on them **Assignment Project Exam Help**
 - “made-up” or “
<https://eduassistpro.github.io/>
- Two types of suc
 - Entering a market with existing com Add WeChat **edu_assist_pro** panyed with some secret weapon that will get them all the us
 - Example?
 - Entering a market that looks small, but which will turn out to be big.
 - Example?
- **Look for problems, preferably problems you have yourself**



Own problems

- The general problems you have
 - Online social network
 - Something to get real-time bus timetable
 - Garage sale
 - Discussion forum
 - Something need <https://eduassistpro.github.io/>
 - ...
- Something at least some users who really need, not just may be one day, but want it urgently.

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Where are the problems ?

- Alert to opportunities
 - Dropbox: forgetting USB sticks

- **Live in the future, then build what's missing.**

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- Be open-minded

- Turn off the filter <https://eduassistpro.github.io/> seeing them
 - Why is your inbox overflowing? get so much email?
What problems are people trying to solve? sending you email?
Are there better ways to solve them? Why do you keep emails
around after you've read them? Is an inbox the optimal tool for
that?

- **Live in the future, then build what seems interesting.**



Inter-disciplinary Problems

- Learning about some other field, you'll probably see problems that software could solve.
 - (a) the inhabitants of that domain are not as likely as software people to have already solved their problems with software, and
 - (b) since you come into the new domain totally ignorant, you don't even know what the s^{ed.}
- Taking a class on ~~ASDV, genetics~~ Add WeChat ~~edu_assist_pro~~ ~~Hgpro~~ work for a biotech company.
 - **One way to ensure you do a good job solving other people's problems is to make them your own.**



Problems

- Serve a small initial group
 - High demands → high competition
 - E.g. Apple, Google, Facebook, Microsoft, etc.

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- Make the users happy
 - First iPhone doe <https://eduassistpro.github.io/>
- Germ problems Add WeChat edu_assist_pro
 - Hard to tell, even experienced investors
 - Airbnb
 - Let hosts rent out space on their floors during conventions. They didn't foresee the expansion of this idea; it forced itself upon them gradually

Any ideas ?



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Critical Factors of Startup Success

1. Idea
2. Leader
3. Team
4. Capital
5. Plan
6. Execution
7. Timing
8. Crisis response
9. Marketing
10. Growth

– <https://www.entrepreneur.com/article/252813>

– **These are experiences, rather than rules.**

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It's not just the classes that make a university such a good place to crank oneself into the future. You're also surrounded by other people trying to do the same thing. If you work on projects, you'll end up

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ideas with empirical teams—and that, teams—and that, function.

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Group Project

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Group Project

- Refer to the Project Guidelines document on Canvas
- Two Phases – Proposal and Final
- Minimum feature set:
 - Graphical user interface (GUI) to effectively interact with the user.
 - At least one for either Cellular, WiFi, Bluetooth, etc. <https://eduassistpro.github.io/>
 - At least one technique to save network usage, computation resource usage or device battery Add WeChat **edu_assist_pro**
 - At least one method to secure the communication or data storage.
- **Come and test/discuss your idea with me !**

App development workflow

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Proposal Phase

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Final Phase

Group Project submission

- Refer to the Project Guidelines document on Canvas
- Proposal Phase: Report (hard & electronic)
- Final Phase:
 - Report (hard & electronic)
 - Presentation slides
 - Video
 - Source Code
 - Presentation and Demo

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Deliverables	Due Time
Proposal	Electronic submission 5:00pm, 28/09/2019 (Monday, Week 06)
Final	Electronic submission 5:00pm, 06/11/2019 (Friday, Week 10)
	Presentation & Demo 5:00pm, 09/11/2019 (Monday, Week 11)

Group enrolment

- Maximum Group size is **FIVE**
- **Enroll to groups via Canvas.**
- Pick a group number attached to the tutorial of most number of group members.
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- Tutorial swap pr <https://eduassistpro.github.io/>
 - First, try to swap it yourself.
 - If the system does not allow you do **Add WeChat edu_assist_pro** ur details here.
 - https://unisyd-my.sharepoint.com/:x/g/personal/chamara_kattadige_sydney_edu_au/Eb4wS1Y01s9Es_pokqWGCrwB0UgFR6NEWJQgvTgDpn8aPA?rtime=6jwiy1IN2Eg

Android Programming Basics - 1

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What is Android?

Major components of Android
Stack

- **Applications:** Users interact with the device via the apps. Can be either first party or third party.
- **Android Framework:** Provides basic functions such as communication between apps, managing voice calls or managing app life cycles.

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Native Libraries: C/C++ libraries that contain code for handling different services like Webkit, SSL, SQLite, and

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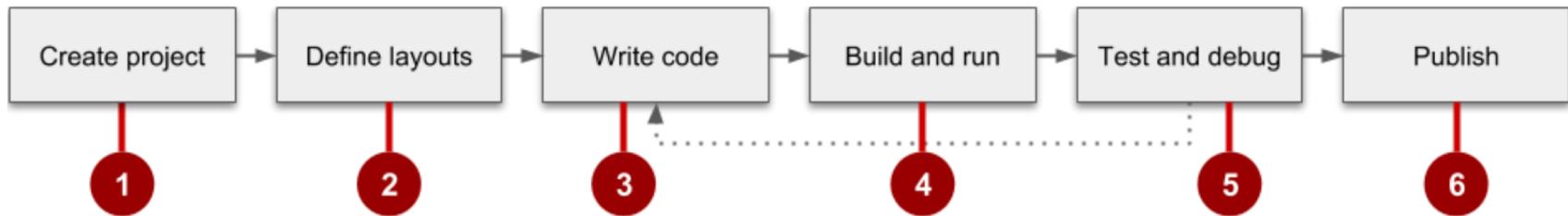
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Android Virtual Machine and
Core Library

- **Hardware Abstraction Layer (HAL):** Converts the Java API calls to system calls that are understood by the Linux kernel.
- **Linux Kernel:** Additional modifications done by Google to make it suitable for smartphones (E.g. power management). Handles all conventional operating system functions such as process management and memory management.

It is easy to develop apps...

- IDE – Android Studio
- Languages
 - Java/Kotlin to develop apps
 - XML to describe data resources
- SDKs hide the complexity
 - E.g.:
 - Java API Framework
 - Google Play Services
- You don't need to know the details of how the APIs work.

Android app development process



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1. Create the project
n appropriate template.
2. Define a layout fo <https://eduassistpro.github.io/>
elements on the scr
nts. You can place UI
directly in the Extensible Markup Lang
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you can write code
3. Write code using the Java programmi
all of the app's components.
Create source code for
4. Build and run the app on real and virtual devices. Use the default build
configuration or create custom builds for different versions of your app.©
5. Test and debug the app's logic and UI.
6. Publish the app by assembling the final APK (package file) and distributing
it through channels such as Google Play.

Resources to help you learn

- **Android developer training courses**
 - Codelabs with suggested homework assignments: [Codelabs for Android Developer Fundamentals](#)
 - Concept reference chapters: [Android Developer Fundamentals — Concepts](#)
 - Source code in GitHub for [starter apps](#) and [solution code](#) for apps that you create in the codelabs

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- The [Android Developers Site](#) is a great source of tutorials and tips.
- <https://eduassistpro.github.io/>
- [Android vocabulary](#)
- Inspire looking at [Add WeChat edu_assist_pro](#)
- **Community Support:**
- The Android team posts news and tips in the [official Android blog](#).
- [Android developers blog](#).
- [Stack Overflow](#). If you run into a problem, chances are high that someone has already posted an answer.
 - Type [android] in the search box. The [] brackets indicate that you want to search for posts that have been tagged as being about Android.

Resources to help you learn

- Android developer fundamentals course
 - Unit 1.4: Resources to help you learn
- This page contains a great collection of links to many resources organ
 - Android Devel <https://eduassistpro.github.io/>
 - Android studio documentation
 - Design **Add WeChat edu_assist_pro**
 - Develop
 - Distribute
 - Blogs
 - Other resources

Building blocks of Android

App components

- Activities
- Services
- Broadcast Receivers
- Content Provider

<https://eduassistpro.github.io/>

Activating components

- Intent

Activity

- One of the basic building block of Android
- Most common component of Android development
- Represents a single screen with user interface
- A single app can have multiple activities. E.g. A game app has login screen, scores page, and the game play screen.
- Associated with a XML file that defines the arrangement of GUI components.
- <https://developer.android.com/guide/components/activities/intro-activities>

Activity Example

activity_main.xml

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<https://eduassistpro.github.io/>

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Activity Operation is
written in Java

Activity Layout and
other resources

Various Layouts

- Layout defines the visual structure of the GUI.
- View hierarchy

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Objects - Layouts

- Linear Layout
- Relative Layout

Web view

Objects - Widgets

- Buttons
- Text view

Layouts

- Can declare Layouts
 - Writing the XML
 - Using Android Studio's "Layout Editor"

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Activity Lifecycle

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Activity Lifecycle

- You can override lifecycle methods to develop your customized activity.
 - E.g. What to do after starting the app → Override onCreate() method
 - From tutorial 1:

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Few ideas on object oriented programming

- The elements we discussed such as Activities, Buttons, TextViews are all classes. What does it mean?
- **Classes and Instances**
- **Attributes and Methods** Project Exam Help
- **Class** is a blueprint of <https://eduassistpro.github.io/> none class will define that each smartphone must have **attributes** such thickness, brand, OS, owner etc. and **methods** such as switch on, s Add WeChat edu_assist_pro
- Kanchana's phone is a specific **instance** of the smartphone class, length=8cm, width=5cm, brand="Nexus", owner="Kanchana" and so on.
- Thilakarathna's phone is a specific **instance** of the smartphone class, length=6cm, width=4cm, brand="iPhone", owner="Thilakarathna" and so on.

Few ideas on object oriented programming

- In the previous example, we creates **instances** of Activity **class** such as MainActivity.
- When we set the ~~Assignment Project Exam Help~~ elements we were assigning v
 - <https://eduassistpro.github.io/>
- We used the ~~onCreate() method~~ Add WeChat edu_assist_pro our GUI logic.

Declaring components – AndroidManifest.xml

- Describes essential information about your app to Android OS
- Examples:
 - App package name
 - Minimum API level required by the app
 - User permission
 - Declare third party services <https://eduassistpro.github.io/>
 - Declare app's components, e.g. Activities
 - Declare component capabilities that can be used Intent filters

```
<?xml version="1.0" encoding="utf-8"?>
<manifest ... >
    <application android:icon="@drawable/app_icon.png" ... >
        <activity android:name="com.example.project.ExampleActivity"
                  android:label="@string/example_label" ... >
            </activity>
            ...
        </application>
    </manifest>
```

<https://developer.android.com/guide/topics/manifest/manifest-intro>

Intents

- Intent is a messaging object to request an action from another app component.
- Primary use-cases:
 - To start an activity
 - To start a service
 - To deliver a broadcast
- Intent types:
 - **Explicit Intents:** Communicate with a specific application. Need to specify the exact name of the component, e.g. class name.
 - **Implicit Intents:** Communicate between applications. Requested by declaring the general action to perform, e.g. location.
- <https://developer.android.com/guide/components/intents-filters>

Building blocks of an Intent

1. Component name

- Name of the component to start
 - Must specify the name for *Explicit Intent*, e.g. class name of the new Activity.
 - Empty for *Implicit Intent*

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2. Action

- String that specifies the desired action.
 - `ACTION_DIAL` - Dial a number
 - `ACTION_EDIT` - Display data to edit
 - `ACTION_SYNC` - Synchronise device data with a server
 - `ACTION_MAIN` - Start as initial activity of the app.

Building blocks of an Intent

3. Data

- Data and type of data (MIME type) associated with the Intent
- Type of data should be related to the action
 - E.g. If the action is ACTION_DIAL, data should be the phone number.
- Formatted as <https://eduassistpro.github.io/>
 - Uri.parse
- Note: To set both Uri and MIME type, `setType()`

Building blocks of an Intent

4. Category

- String containing additional information about the component
 - `CATEGORY_BROWSABLE` – To start a web browser to display data
- Specify the category with `addCategory()`

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5. Extras

- Key-value pair `https://eduassistpro.github.io/` to complete the action
- Add extra info with `putExtra()`

6. Flags

- Metadata for the intent
 - E.g. How to launch the activity, how to treat it after launching, etc.
- Can set flags using `setFlags()`

Example 1

- Start another activity using an Intent
- Example: Tutorial 2
 - What type of an Intent is used ?

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Example 2

- Communicate between apps.
- By declaring the general action to perform. In this case,
 - Action: **ACTION_VIEW**
 - Data: Formatted as Uniform Resource Identifier (URI object) to send Intent Data

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- What type of intent is this?
- What can go wrong with the code above code block?

Intent Filters

- Declare which Intents that your app can receive with **intent-filter** element in your **AndroidManifest.xml**
 - The manifest file describes essential information about your app to the Android build tools, the Android operating system, and Google Play.
- This is how Android pass Implicit Intents to relevant apps
- Define **<action https://eduassistpro.github.io/**
- E.g. Declaration to receive **ACTI nt with text data Add WeChat edu_assist_pro**

Intent Filters

- Who had a look at the AndroidManifest.xml files of Tutorial 1?
- Were there any Intent filter?

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Intent Filters

- **ACTION_MAIN** indicates this activity is the main entry point when the user launch the app and does not expect any intent data.
- **CATEGORY_LAUNCHER** indicates that activity's icon should be placed in the sys

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What's Next ?

- In Week 3;
 - Capabilities of Mobile Devices, e.g. sensors, location, etc.
 - Android building blocks
 - Services
 - Broadcast Receiver
 - Content Provider
- Project <https://eduassistpro.github.io/>
 - Guideline is on Canvas
 - Start forming groups and thinking ab
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- Tutorial 2
 - Tutors will help you to sign-in/register for project groups
 - Register the group with the tutorial class of most members
- Please use “COMP5216” on the subject when you email me.