BINUS University

Academic Career: ***Undergraduate / ~~Master~~ / ~~Doctoral~~ *)***			**Class Program:** ***~~International~~/Regular/~~Smart Program~~/~~Global Class~~*)***		
☐ **Mid Exam** ☑ **Final Exam** ☐ **Short Term Exam** ☐ **Others Exam : _____**			**Term : ~~Odd~~/Even/~~Short~~ *)**		
☑ **Kemanggisan** ☐ **Alam Sutera** ☐ **Bekasi** ☐ **Senayan** ☐ **Bandung** ☐ **Malang**			**Academic Year :** **2020 / 2021**		
Faculty / Dept.	:	School of Computer Science	Deadline	Day / Date :	Sabtu / 24 Juli 2021
				Time :	17:00
Code - Course	:	MOBI6002 – Mobile Object Oriented Programming	Class	:	All Classes
Lecturer	:	Team	Exam Type	:	Online
*) *Strikethrough the unnecessary items*					
The penalty for CHEATING is DROP OUT!!!					

Learning Outcomes :
LO1 : Explain the Object Oriented Concept
LO2 : Recognize Fundamental Knowledge of Java and Mobile Technology and Development
LO3 : Give examples Simple Java Application using Core Java
LO4 : Build a simple application based on Java Android**.**

I. Esai (30 %)

1. **(LO1,LO2,LO3, 15%)** Explain ConstrainLayouts in Android UI and Java Programming.
   a. (7.5%) Explain 5 possible constraints in terms of positioning your UI widget components. Write and show it in the layout xml file.
   b. (7.5%) Write a java program in your Android project that will implement listener when a button object is clicked. The result of click button is shown on the screen.

2. **(LO2,LO3,LO4, 15%)** Multi threading in Java. Inheritance. Interface.
   a. (7.5%) Write a code that shows how to implement thread using 2 types of approach in Java.
   b. (7.5%) Write a main program that will create 2 x 10 threads, 10 threads using first approach and execute **funcA**, second 10 threads using second approach and execute **funcB**. **funcA** is a method that do something different with method **funcB**.

II. Use Case (LO2, LO3, LO4, 70 %)

Game Battle of Castle

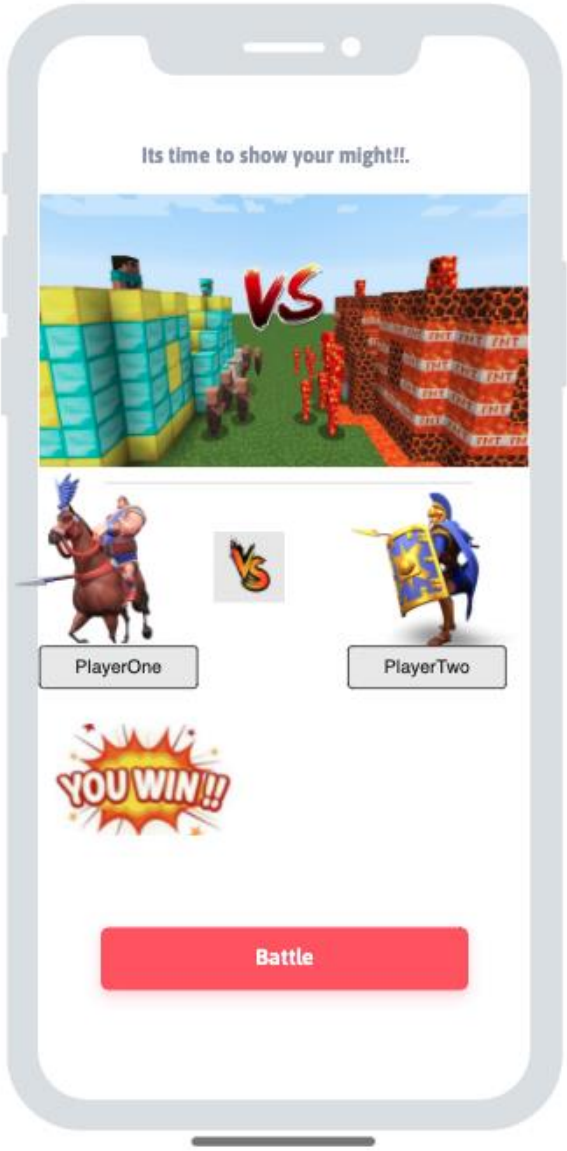
Create Android App that has 1 single screen / activity.
The main activity will show a battle of two castle, with a button to start the battle.

The battle process is simply call the method that will result to who will win and who will lose.

Verified by,

I Gusti Gede Krisna Dewanta (D6425) and sent to Program on Jun 26, 2021

The screen DOES NOT show the battle animation where Army moves and attack each other. Please see the mockup design below as reference, and you are free to design that looks similar.



(*) some images taken from game: Rise of Kingdom)

The Game play of battle will follow, but not limited to, the below requirement:
The game is about war game played by multiple players.
Every player has a castle. In a castle there will be armies, with 4 categories: Infantry, Cavalry, Archer, Catapult.
Every castle has different Skin: Horse, Wood, Steel, Stone
Skin will boost 20% skill of Cavalry, Archer, Infatry, Catapult respectively.

- Horse castle -> boost 20% Cavalry skill
- Wood castle -> boost 20% Archer skill,
- Steel castle -> boost 20% Infantry skill,
- Stone castle -> boost 20% Catapult skill,

Castle skin can be changed anytime by player.

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Every castle may have many heroes, there 4 types of heroes.
Each heroes has category either leader of :

- Infantry (boost 40% attack infantry),
- Cavalry(boost 40% attack Cavalry),
- Archer(boost 40% attack Archer),
- Catapult(boost 40% attack Catapult),

Hero has level from level 1 up to level 50.

Battle rules / formula:

- Troops send to battle with maximum number of 100.000 troops (can be single type of army or mix).
  I.e Battle of Player 1 (100.000 Cavalry) **vs** Player 2 (75.000 infantry + 25.000 archer)
- Maximum 5 heroes send to Battle.
- 1 Cavalry will kill 0.4 Infantry, 0.1 Archer (I.e 100.000 cavalry will kill max 40.000 infantry)
- 1 Infantry will kill 0.1 Cavalry, 0.4 Archer (I.e 100.000 infantry will kill max 10.000 Cavalry)
- 1 Archer will kill 0.4 Cavalry, 0.1 Infantry (I.e 100.000 Infantry will kill max 40.000 Archer, I.e 100.000 Archer will kill max 40.000 Cavalry)

Battle example and casualties formula

Player A send **5 Cavalry heroes** with 100k Cavalry vs Player B send **5 Infantry heroes** with 100k Infantry
Result:
Player A boost: 5 heroes x 40% cav attack = 200% boost added. Cav troops similar to 100k + 200% x 100k
Player A total = 300k power of cavalry

Player B boost: 5 heroes x 40% infantry attack = 200% boost added. Infantry troops similar to 100k + 200% x 100k
Player B total = 300k power of infantry

300k power Cavalry AGAINST 300k power infantry
=> 30k cavalry dead AGAINST **90k** infantry dead

Casualties explained:
30k Cavalry dead because 300k power infantry can kill each 0.1 cavalry = 30k cavalry
30k Infantry dead because 300k cavalry can kill each 0.3 infantry = 90k infantry

WIN: Player A with 30k dead armies 70k survives
LOST: Player B with 90k dead armies, 10k survives

ATTENTION:
Students odd id (NIM ganjil): Implement a simulation of 2 battles between Cavalry vs Infantry AND Infantry vs (Cavalry + Range)
Students even id (NIM genap): Implement a simulation of 2 battles between: Cavalry vs Archer AND mix armies vs Infantry

EXPECTED RESULT:
Android App using Java Programming language, Constraint layout based on given mockup design. Battle simulation result shown on the UI.

Your project source code only and explanation in PDF is submitted to Binusmaya,
Github URL is provided in your document.

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