Engineering Design for Embedded Systems
Assignment 12: Create a game with Android

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Due Date: April 8, 2013

Learning Goals

The goals of this assignment include:

- Getting more Android development experience.
- Leading an iteration of the software development life cycle by designing, developing and testing an Android application.
- Gaining an improved understanding of the design challenges inherent to coding and how to overcome them.

Your Task

For this assignment, you will write a mobile game for Android. The game can be designed and developed any way you want, but it must be able to run on any Android device running Android 2.3.3 Gingerbread or higher.
Your game must be well-tested and stable. Also, your game must look presentable and visually pleasing (put some effort into it!).
To help you calibrate our expectations:

- a blackjack game like the one I used for A10 would net you a 6/10: it doesn't represent a real deck (-1 mark for level design) and is not visually pleasing (-2 marks for visuals). I will explain more in the tutorial.
- a very simple game like Tic-Tac-Toe or something that doesn't require level or control design will not receive full marks for those categories.
- if it is clear that very little effort was put into your submission, you will receive no more than 2/10.

A submission like this will not earn you marks:
`http://www.youtube.com/watch?v=cD69PAIqiYo`

Some Words on Game Development

A game generally consists of two main parts: a **start screen** and a **game loop.** The start screen introduces the game and also may provide options to set the parameters of the game. The game loop runs the actual game itself. You will use the Android event loop for your game activity as your game loop; it will respond to user actions and present new game states.

Your game will likely fall into one of these three categories:

- A short, simple game that is easy to learn and hard to master (e.g. billiards, Counter-Strike).
- A level-based game in which the player must navigate obstacles to reach the end of the level (e.g. Super Mario Bros. and most puzzle games).
- A story-driven game in which the player's decisions can affect the outcome in potentially unexpected ways (e.g. choose-your-own adventure games, some RPGs, and board games such as Monopoly).

Marking

- **Start Screen—2 Marks:** Your game must include a title screen with the name of the game and the author. If necessary, the start screen should also include options to set game parameters. Also, the start screen should be aesthetically pleasing (to attract players).
- **Overall Functionality—2 Marks:** The game should consist of reasonably sturdy code: don't crash! You will lose 1 functionality mark for each misbehaviour I detect (including program crashes and instances where the game does something it's clearly not supposed to do). You can get bonus marks if you can implement good use of sound effects/music or if you implement multiplayer functionality.
- **Level Design—2 Marks:** Your overall game design should be visually pleasing, and the level design should not be too easy or too difficult. Otherwise, the game can lose its appeal very quickly. For non-level-based games, I'll evaluate overall game mechanics, including the story or the appeal of the basic idea behind the game.
- **Control Design—2 Marks:** The controls for the game should be intuitive, easy to use, and not require any prior knowledge to play. The controls should also accurately respond to user input. Bonus marks will be awarded to those who make effective use of multitouch or the accelerometer to control the game.
- **Enjoyment Value—2 Marks:** You will be awarded full marks if I can play your game for 5 minutes without getting horribly frustrated or bored (I will ask other people to test it if I don't like your game).

Don't Want to Make a Game?

No problem! Instead, feel free to make an Android app that performs a useful function (i.e. something one would download off the Play Store).

- **Features—3 marks.** The app must contain three major features (e.g. a calculator that performs basic operations, trigonometric operations and solves linear equations).
- **Design—5 marks.** The app must also meet criteria for good design; must look visually pleasing; and implement a usable workflow. (I shouldn't have to navigate a series of menus to perform a quick task)
- **Stability—2 marks:** The app must also run without bugs or crashes.

Deliverables

Please submit an unsigned APK file to: <userid>/a12/a12_userid.apk. Please submit your code as well.

Final word

Have fun!