Instituto Superior de Engenharia de Lisboa

Licenciatura em Engenharia Informática e de Computadores
Licenciatura em Engenharia Informática, Redes e Telecomunicações

Mobile Devices Programming
Practical Assignment - Option A, Winter Semester 2025/2026

Delivery date: December 21, 2025

This document specifies the requirements for **Option A** of this course's practical assignment. In this option, your task is to implement the **Chelas Poker Dice** application, a two-player Poker Dice game running on a single Android device, supporting *human vs human* and *human vs AI* gameplay modes.

The game is played over N rounds, where N is an odd number chosen at the start. Each round consists of two turns, one per player. On their turn, players start by rolling all 5 dice and may, up to two times, hold any subset and re-roll the remaining dice, for a maximum of three rolls per turn. At the end of the rolls, the player's final dice combination is established (i.e., the player's hand for the turn). Once both players have taken their turn in the round, their hands are compared and the higher-ranking hand wins the round. Then the next round begins, with the starting player alternating between rounds. After all N rounds are completed, the player who has won the most rounds is declared the victor.

Dice combinations are ranked in descending order of strength as follows: *Five of a Kind*, *Four of a Kind*, *Full House*, *Straight*, *Three of a Kind*, *Two Pair*, *One Pair,* and finally *Bust* (no combination, hand strength determined by the highest die). These rankings adhere to the traditional poker-style hierarchy adapted for dice-based gameplay, with *Five of a Kind* placed above all other hands and excluding *Flushes*.

The **Chelas Poker Dice** application contains the following screens:
- Title - main menu;
- Match Setup - configure a new game (mode, players, number of rounds);
- About - information regarding the game and the application authors;
- Game - play turns, rounds and announce results;
- Statistics (Stats) - dice combinations statistics per player, including the AI

The suggested application navigation is depicted in Figure 1, where arrows represent navigation options. Usage starts at the Title screen, where the application's main menu is presented. There, the player can either elect to start a match (Match Setup screen), see the available game information (About screen) or consult the record game statistics (Stats screen). Further details pertaining to the functionalities provided in each screen are described in the Planning section, where the development milestones are also presented.

Authors are free to improve on the suggested navigation experience. The remaining details, such as the general appearance of the UI, which orientation is used in each screen, and further interaction details are left to the authors' discretion. A good reference for designing user experiences (UX) is "Don't Make Me Think, Revisited: A Common Sense Approach to Web Usability", by Steve Krug
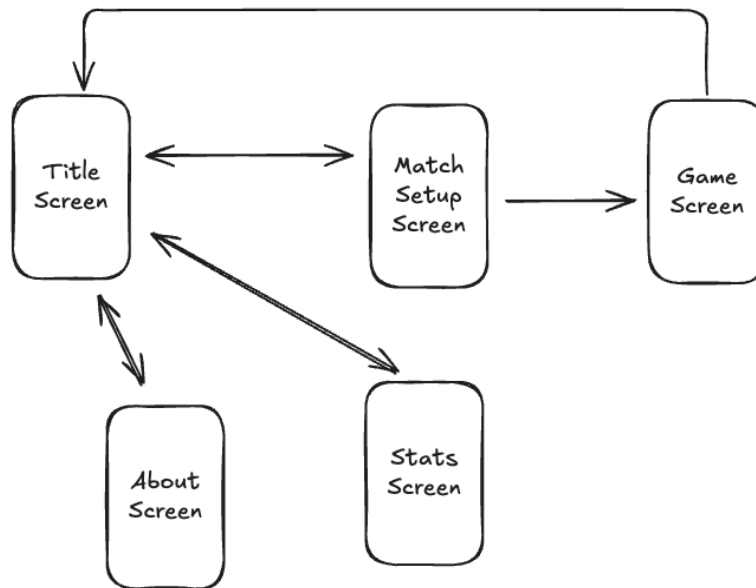
Figure 1 - Suggested application navigation

Planning

The project's milestones are presented next. In each milestone, students are expected to deliver the described functionalities. Deliveries are carried out by creating "chepd_a_X" tags, where "X" stands for the milestone number, in the group's GitHub repository. The repository is created within the scope of GitHub Classrooms by the teacher of each section group and **must contain at its root the README.md file with the identification of the group's members and the link to the video demonstrating how the application works.**

Milestone 1 (week 2 - 15/09/2025)

Deliverables: Title screen and About screen.
- Title screen: displays the application title and the following menu options
    - Start Match → navigates to Match Setup
    - Statistics → navigates to Stats
    - About → navigates to About
- About screen: shows application information.
    - Includes general description of gameplay and link to web page with detailed description
    - Lists all group members with name and student number
    - Includes a button that opens the email app to contact all group members

Acceptance criteria:
- The app starts at the Title screen
- All three menu options are visible and lead to the corresponding screens (dummy screens)
- The About screen shows correct group information and an email button
- When the link for the detailed gameplay description is pressed, the browser opens it
- Pressing the email button opens the email app
- Navigation back to the Title screen is always possible

Milestone 2 (week 4 - 29/09/2025)

Deliverables: Match Setup screen, used to configure a new game before it starts.
- Select mode: Human vs Human or Human vs AI
- Input player(s) names

- Define the number of rounds (N), which must be odd
- Choose the starting player (Player 1, Player 2, or Random)
- Start Match button begins the game with the specified configuration

Acceptance criteria:
- All described fields and choices are available
- Invalid configurations (e.g., even number of rounds) are not accepted
- Starting a match leads directly to the Game screen (dummy implementation that simply displays the game's configuration info)
- Cancelling or going back returns to the Title screen

Milestone 3 (week 10 - 13/10/2025)

Deliverables: Game screen, used to play the game.
- Only supports human vs human
- For each turn:
  - Displays current player, current round, and number of re-rolls left
  - Displays the five dice; players can hold and release dice if re-rolls are available
  - Allows up to three rolls in total
- After both players' turns:
  - Display players' hands and announce round winner
  - Alternate starting player for the next round
- At the end of the match:
  - Show the score and identify the winner

Acceptance criteria:
- The screen clearly indicates whose turn it is
- During the player's turn, the dice configuration (hand) is displayed at all time
- Dice can be rolled, held, and re-rolled up to the allowed maximum
- At any moment, the state of each die is clearly identifiable
- Dice rolls are not instantaneous
- After both players finish, the round winner is announced
- The match ends only after all rounds are played
- The match winner is displayed when the game ends

Milestone 4 (week 12 - 24/11/2025)

Deliverables: Upgrade of the Game screen, used to play the game.
- Adds AI opponent support
- AI follows the same rules: up to three rolls per turn, with dice held and re-rolled
- AI plays automatically in its turn

Acceptance criteria:
- Human vs AI option in Match Setup starts a game where the opponent is AI
- The AI plays without user input and completes its turn automatically
- AI moves are not instantaneous and are legible (i.e., easily understood by the player)
- The match proceeds correctly, alternating between human and AI turns
- At the end of the match, the correct winner is shown

Deliverables: Stats screen, used to display statistics.
- Statistics are aggregated per player, including AI
- Statistics include:
  - Number of games played and won
  - Victory ratio (in percentage)
  - Frequency of each hand
- Statistics are preserved across application restarts

Acceptance criteria:
- Statistics show meaningful values for both human players and AI
- Playing new matches updates the statistics
- Data remains available even after closing and reopening the app

Final Milestone (week 15 - 15/12/2025)

Final Demo
- Deliver a complete and fully functional version of the application
- All features from previous milestones must be integrated and working together
- The group must prepare a short demo video (5–7 minutes) showcasing the application in action
- The demo must cover: starting a match, playing several rounds, showing a match result, verifying updated statistics, and navigating to all screens
- The video link must be included in the repository's README.md file

Acceptance criteria:
- The app is complete and stable, with all planned screens accessible
- All functionality works as specified in earlier milestones
- The demo video clearly shows the application's features
- The repository is correctly tagged (chepd_a_f) and contains the video link in the README.md

Due date
December 21, 2025

ISEL, September 8, 2025