



COMPUTER APP PROGRAMMING (CAP 2015) 電腦應用程式比賽2015

CAP Day 即日解難比賽

Regulations:

1. The time limit for this competition is **1 hour**.
2. There are 2 questions in this paper. **Attempt ALL questions.**
3. Follow the instructions on the paper to submit the answers.
4. All candidates must stop their work when the invigilator announces “Times up.”
5. Candidates may use their own Android device **ONLY** for program testing purpose.
6. If any candidate is found cheating or violating the regulations by any means, he/she will be disqualified from the competition immediately.

比賽守則：

1. 本比賽限時 **1 小時**。
2. 本卷共有兩道題目，**需全部作答**。
3. 請依照試題上的指示，完成答卷。
4. 當考場人員宣布「比賽結束」的時候，所有參賽者必須停止作答。
5. 參賽者可以自備 **Android** 裝置，但只能用作測試程序。
6. 若發現任何參賽者作弊或者違反比賽守則，將被即時取消參賽資格。

Question 1: Save the project as “Question_1”. 請開新專案，命名為 “Question_1”。

Question 2: Save the project as “Question_2”. 請開新專案，命名為 “Question_2”。

Question 1

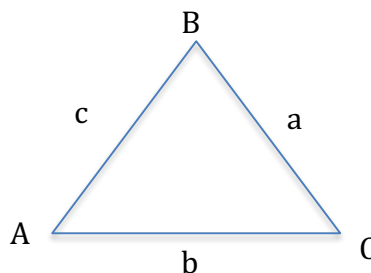
Design an app for drawing a triangle by dragging three dynamic “balls” in a “canvas”. The app will display the value of the three angles in degree. You can make use of the Distance Formula and Cosine Formula as shown below to calculate the angles. (30% for drawing the triangle, 10% for calculating the angles)

設計一個應用程式, 在“畫布”上拖動三個可移動的“球形精靈”從而組成一個三角形。程式會自動計算出三角形的三個角度並顯示在程式上。你可運用距離公式及餘弦公式(如下)進行運算。

(畫三角形 30 分, 計算角度 10 分)

$$\text{Distance between } A(x_1, y_1) \text{ and } B(x_2, y_2) = \sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}$$

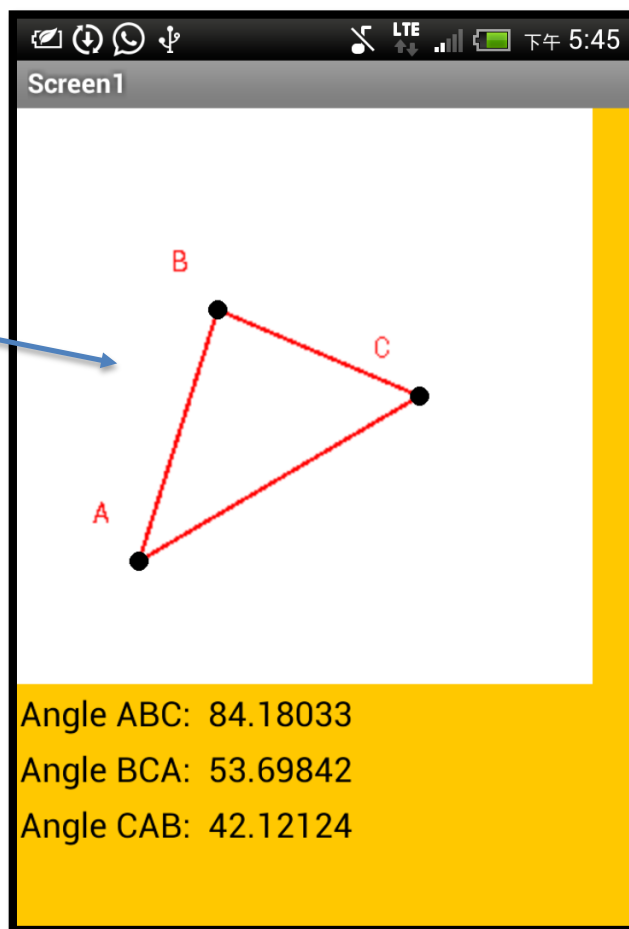
$$\angle BAC = \text{Arccos} \left(\frac{b^2 + c^2 - a^2}{2bc} \right)$$



Demo app screenshot for Question 1

Construct a triangle by moving the three black “balls”
拖動三個可移動的“球形精靈”組成一個三角形

Display the value of three angles in degree using the Cosine Formula
運用餘弦公式計算出三角形的三個角度並顯示在程式上



Question 2

Design a “phone book” app that can store the name, phone number and birthday of a contact person in a device. The functions of the phone book should include:

- Displaying the information of contacts (15%)
- Adding new contacts (5%)
- Editing the information of contacts (5%)
- Using a “list picker” to select the contact to be displayed (5%)
- Using a “date picker” to input the birthday of the contact (5%)
- Saving information of contacts in a TinyDB (15%)
- Deleting contacts (5%)
- Calling a contact (5%)

設計一個“電話簿”應用程式, 用以儲存聯絡人的姓名, 電話號碼及出生日期在用家的手機上。應用程式的功能需包括:

- 顯示聯絡人的資料 (15%)
- 新增聯絡人 (5%)
- 修改聯絡人資料 (5%)
- 用“清單選擇器”選擇要顯示或修改的聯絡人資料 (5%)
- 用“日期選擇器”選擇聯絡人的出生日期 (5%)
- 用“微資料庫”儲存聯絡人資料 (15%)
- 刪除聯絡人資料 (5%)
- 致電聯絡人 (5%)

Demo app screenshot for Question 2

The screenshot shows a mobile application interface titled "Screen 1". It features several interactive elements: a "Choose contacts" button, an "Add contacts" button, a text input field for "Name" containing "calvin", a text input field for "Phone number" containing "23456789" (highlighted with an orange border), a "Call" button, a date picker for "Birthday" showing "1/1/1990", a "Save changes" button, and a "Delete this contact" button. The status bar at the top shows "LTE", signal strength, battery, and the time "下午 4:31".

Annotations with arrows point to specific features:

- "List picker" to select the contact to be displayed
"清單選擇器"選擇要顯示或修改的聯絡人資料
- Adding new contacts
新增聯絡人
- Calling the contact
致電聯絡人
- "Date picker" to input the birthday of the contact
"日期選擇器"選擇聯絡人的出生日期
- Saving information of contacts in a TinyDB
用"微資料庫"儲存聯絡人資料
- Deleting contacts
刪除聯絡人資料