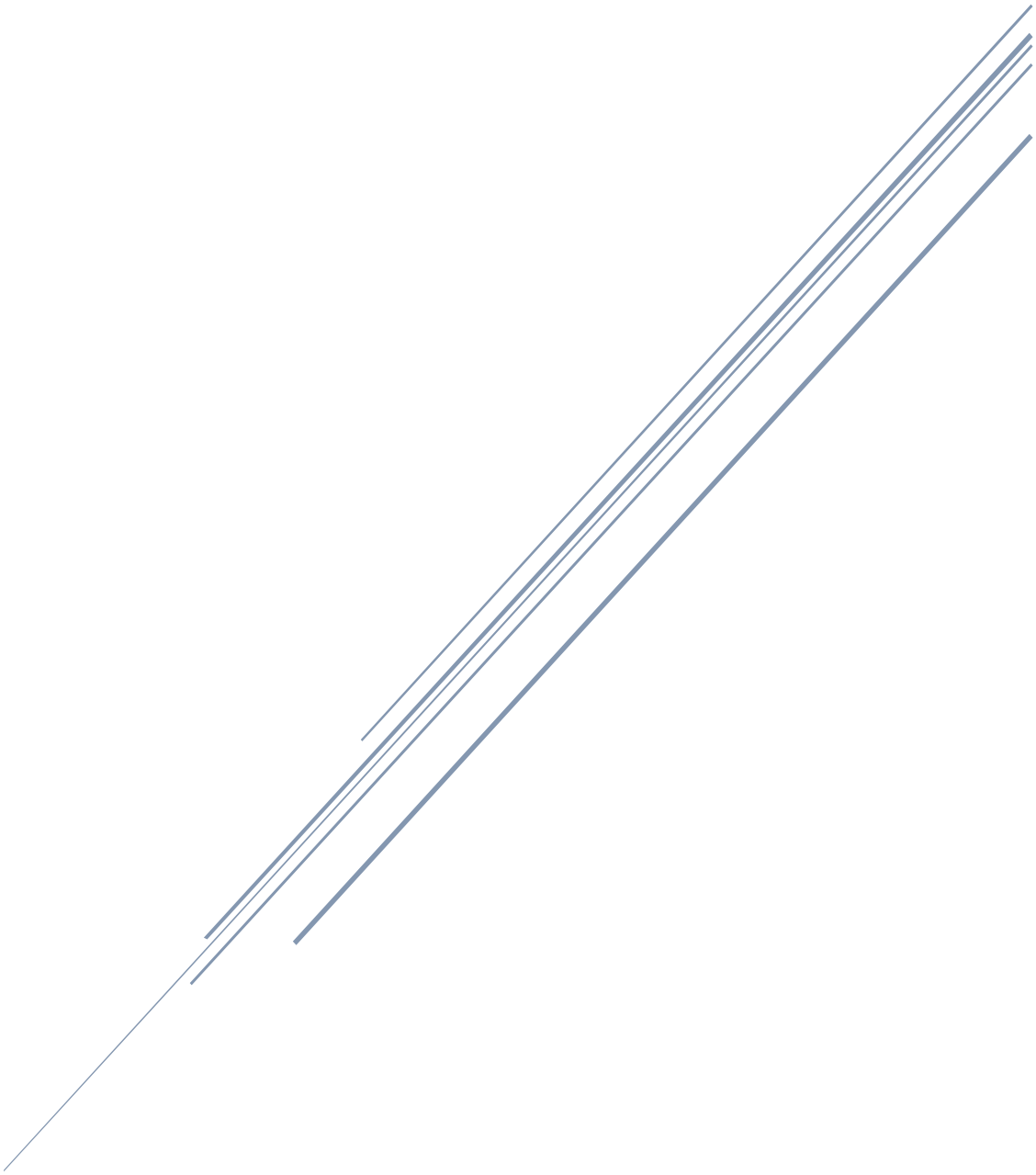
# INF-2C SOFTWARE ENGINEERING

## Coursework 1



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## 3.1 App Name:

- TOUROUND

## 3.2 Description:

- The app provides attractive tours around the fascinating spots in the city which would let you have a better travelling experience. When following the tour that you selected, simply follow the directions, which are suitable for users on foot, and you will reach the destination. Also, you could have a better knowledge of the city by viewing the annotations provided.

## 3.3 Stakeholders:

- User: Users, especially visitors to the city, would like to have an efficient app helping them travel around the city and have a better knowing of the city; And sometimes, they need to pay for the tours.
- Author: Authors would get paid for each tour they complete.
- App company: The app company profit from the app which they release and maintain.
- Investor: Investors profit from the app they invested.
- Local store: Local stores would get an increasing turnover by advertising on the app.
- Travelling spot owner: Owners of travelling spots that cost money would get an increasing in turnover by advertising on the app.
- Local police: The local police's work might increase due to the possible increase of the visiting population.
- Government: The government would support the app company since it will create more working opportunities.
- Local community: The app company might help improve the well-being of the local communities as they help promoting the app and improve the accuracy of the data i.e. tours.
- Government regulatory agency: Government regulatory agency have the duty to make sure that the app obeys all concerning regulations.
- Tax collection agency: Tax collection agencies have the duty to collect taxes from the app company.
- The media: The media would get paid when broadcasting the commercials of the app.
- Labour union: Labour union helps provide a better scheduling of worktime for employees, which could make employees more efficient.
- Travel agency: Travel agencies might lose a proportion of customers due to app
- Bookstore and the Press: Bookstores and the Press might experience a decrease in sale on travelling related books due to the app.

## 3.4 System state:

- User mode:
  i) Normal conditions:
     (1) Browse tour:

(a) Display list: Display the listing of the tours.
(b) Display tour: Display details of a selected tours.
(c) Return list: Return to the part of the list that the user was viewing.

(2) Select tour:
(a) Display tour: Display the selected tour.
(b) Confirmation: Confirm selection when the user presses the 'select' button.

(3) Pay for tour:
(a) Change interface: Jump to payment interface if the selected tour is not for free.
(b) Display detail: Display the details of the selected tour and the price.
(c) Display payment: Display the payment details simultaneously when the user inputs them.
(d) Process payment: Process payment with the server.
(e) Display result: Display payment result.

(4) Follow tour:
(a) Display information: Display information for the selected (and payed if not free) tour.
(b) Display start annotation: Display annotations for the start waypoint.
(c) Display direction: Display directions to the next waypoint.
(d) Display leg annotation: Display the annotations for the leg.
(e) Display reached annotation: Display the annotations for the reached waypoint.
(f) Display end: If the reached waypoint is destination, then display the 'end' trip button.
(g) Change interface: Jump to the browse tour interface if the user presses the 'end' trip button.

ii) Failure conditions:

(1) Internet fails:
(a) Browse tour:
(i) Display error: Display the error message.
(ii) Display cache: Display the caches on the phone.
(b) Select tour:
(i) Display error: Display the error message.
(ii) Set button: Set the 'select' button to unclickable.
(c) Pay for tour:
(i) Display error: Display the error message.
(ii) Display cache: Display the caches on the phone.
(d) Follow tour:
(i) Display error: Display the error message.
(ii) Display audio: Display the audio.
(iii) Display cache: Display the caches.

(2) GPS fails:
(a) Follow tour:
(i) Display error: Display the error message.
(ii) Navigation: Navigate using internet only.
(b) Other:

(i) Display error: Display the error message.

- Author mode:
  i) Normal conditions:
    (1) Create template: Create a blank template for the new tour.
    (2) Record direction: Record directions for the next waypoint.
    (3) Record leg annotation: Record annotations for the leg.
    (4) Record waypoint annotation: Record annotations for the waypoint.
    (5) Mark destination: Mark the destination when it is reached.
    (6) Edition: Edit the annotations.
    (7) Addition: Add descriptions.
    (8) Upload: Upload the tour.
  ii) Failure conditions:
    (1) Internet fails:
      (a) Display error: Display the error message.
      (b) Save: Save the unfinished work in the device.
    (2) GPS fails:
      (a) Display: Display the error message.
      (b) Display suggestion: Suggest the author not to carry on.
      (c) Save: Save the unfinished work in the device.

## 3.5 Use-cases:

- Use case name: Follow tour
- Primary actor: User
- Supplementary actor: App
- Summary: User chooses a preferred tour; User pays for the tour if it costs money; User browses annotations, follows the directions, and reaches the destination.
- Precondition:
  i) The device has a functioning power source.
  ii) The device has a connected internet service.
  iii) The device has an available GPS signal.
- Trigger: User chooses a preferred tour.
- Guarantees:
  i) Success Guarantees: All annotations are properly displayed. All directions are correctly given. And the user would safely arrive at the destination.
  ii) Failure Guarantees: If the app fails to function and the fee has been paid by the user, the fee should be refunded to the user.
  iii) Minimal Guarantees: The app leads the user to the expected destination.
- Main Success Scenario:
  1. User chooses a preferred tour.
  2. App jumps to payment interface if the selected tour costs money.
  3. User pays for the fee if the fee has never been payed yet.
  4. App provides the annotations for the start waypoint.
  5. User presses the start tour button.
  6. App provides directions to the next waypoint.
  7. User follows the directions.
  8. App provides annotations for the leg if there is one.

9. User reaches the next waypoint.
10. App provides annotations for the reached point.

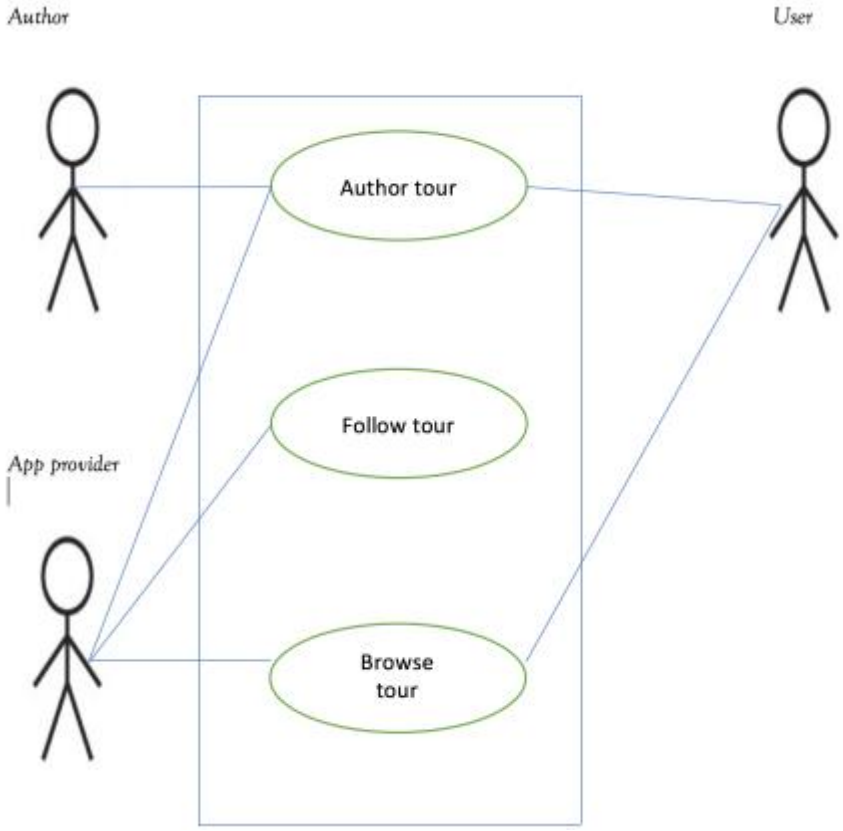
- Extensions:
  7a. The user fails to follow the directions.
  .1 App does a rerouting and give new directions.
  10a. The reached point is not the destination of the tour.
  .1 Jumps to 6.
- Notes:
  i) The location sensing service is GPS-based, and the app would be warned when the user is off course.
  ii) How are display and audio updated:
    (1) Display:
      (a) User is shown with the thumbnails and general features of all the tours when browsing tours.
      (b) User is shown with several photos, some more detailed features of the clicked tour and a 'select' button.
      (c) When the user presses the 'select' button, the app jumps to an interface showing the price, some details of the tour and the columns for entering payment details.
      (d) After entering the payment details, the user presses 'pay' button.
      (e) App jumps to a new interface showing payment success.
      (f) After pressing the 'continue' button, the user could view the general information of the journey (e.g. a highlighted route of the journey on a map, the estimated time of arrival etc.), the introduction (in form of text, photo, or video) of the start waypoint and a 'start' button.
      (g) After pressing the 'start' button, the user is shown with a more detailed highlighted route on a map and some concise directions (they are updated actively as the user changes his position).
      (h) After reaching the next waypoint, the user is shown with the introduction (in form of text, photo, or video) of that waypoint.
    (2) Audio:
      (a) After pressing the 'continue' button, the user could hear the introduction in an audio form of the start waypoint.
      (b) After pressing the 'start' button, the user could hear a short message, "Tour starts", and detailed directions in audio form (directions are updated actively as the user changes his position).
      (c) After reaching the next waypoint, the user could hear the introduction in an audio form of that waypoint.

- Use case name: Browse tour
- Primary Actor: User
- Main Success Scenario:
  1. App provides the list of the tours with the descriptions.
  2. User browses the list.
  3. User selects a tour.
  4. App provides the detailed information about the selected tour.
  5. User presses the 'return' button.

6. App displays the list at the position where the user selects the previous tour.

- Extensions:
  6a. The reached waypoint is not the destination of the tour.
  .1 Jumps to 3.
  10a. The author wants to do some changes before the final upload.
  .1 Jumps to 8.
- Use case name: Author tour
- Primary Actor: Author
- Main Success Scenario:
  1. Author creates a template for the new tour.
  2. Author notes the annotation for the starting waypoint.
  3. Author follows the intended directions and records them.
  4. Author notes the annotation for the leg.
  5. Author reaches the next waypoint.
  6. Author notes the annotation for the reached point.
  7. Author notes the destination when it is reached.
  8. Author edits the finished annotations.
  9. Author adds the descriptions for the tour.
  10. Author uploads the tour.
- Extensions:
  6a. The reached waypoint is not the destination of the tour.
  .1 Jumps to 3.
  10a. The author wants to do some changes before the final upload.
  .1 Jumps to 8.

## 3.6 Use-case diagram:




## 3.7 Non-functional requirements:

- Security requirements:
  i) Encryption: All data should be encrypted before its transmission.
  ii) Verification: The app should verify the identity of the user.
  iii) Authorization: All transaction should be authorized and confirmed.
  iv) Protection: The server should be able to resist the attacks from malwares.
- Usability requirements:
  i) Ease of using: First-time user should be able to be familiar with the app in a very short time.
  ii) Multilingual access: The app should provide multilingual versions for people from countries.
- Performance requirements:
  i) Response time: The app should respond to any operation within 2 seconds.
  ii) System dependability: Disfunction of the app should not occur unless the device loses the signal of network or GPS; If that happens, the user should be informed.
  iii) Resources required: The app should be efficient and use as less memory as possible (e.g. 200 to 500 MB in ROM and 300 – 600 MB in RAM).
  iv) Battery usage: Battery is a valuable resource for smart devices, so low-consuming of battery is necessary. Make sure there would be no consumption of battery when the app is not used and the device would run for 6-9 hours when the app is in constant use, depending on the device.
  v) Screen resolution: There should be various versions of resolution that would fit a wide range of devices from tablets to smartwatch.

vi) Interrupt, notifications, and multi-tasking: When a phone call, a text message or some other notifications arrives and the user decide to respond to them, it should make sure it would not affect the system to handle the interruption and it will maintain its conditions to resume after the interruption.
vii) Data roaming: For users whose devices need data roaming while accessing the internet, the app should provide low-quality photos and videos or even no photos and videos according to the preference of the user and the condition of the internet.

- Reliability requirements:
  i) Internet service: The app should be able to connect the internet with different internet providers.
  ii) GPS service: The app should be located at every GPS covered area.
  iii) Payment service: The app should accept most mainstream card types.
  iv) Multiple platforms: The app should be available on multiple platforms, such as tablets, smartphones, and smartwatches.
- Safety:
  i) It will not affect the use of other apps.
  ii) It cannot cause any damages to the phone or its internal components.
- Maintainability requirements:
  i) Tours: Authors should maintain the accuracy of the tours.
  ii) App: The developers should maintain the correct functioning of the app.

## 3.8 Ambiguities:

1. Avoid repeated payment: The task did not specify a way to check whether the user had paid for the trip before.
2. Payment method: The task did not specify the available payment methods.
3. Refunding: The task did not specify the refunding details.
4. Sorting: The task did not specify any sorting method of the list.
5. Filtering: The task did not specify any filters of the list.
6. Searching: The task did not specify any keyword searching.