# Guidelines for Report 1
First App

Options 1 and 2

Assignment 1

- The first assignment consists on developing an App that provides location and activity information, similar to the image below. Once you push a button, you need to highlight the area/cell where you are (out of four cells in total) and identify the activity you are performing (out of three possible activities).

- For this assignment you do NOT need to apply Bayes, only KNN for both localization and activity recognition. You need to determine the features to use, the value of K and the type of distance. You also have to define your own scenario (at home). The smaller the cells, the more challenging the localization problem is and the higher the grade.

- You need to state the number of samples for your training and testing phases.

- Report the accuracy of your App, for localization and activity recognition, using a confusion matrix. (This will be explained in class)
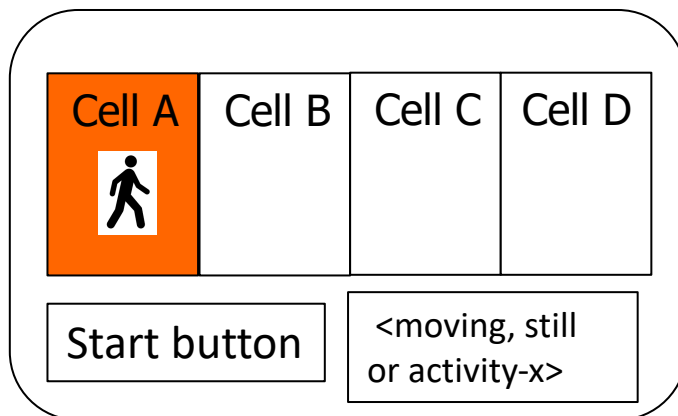
(1) Determine where you are among four zones, &
(2) Determine if you are walking, still or doing activity-X. You will define what activity-X is (jumping jacks, abs, etc). Be creative. The more challenging the activity (in terms of its difficulty to be recognized from walking) the higher the grade.

General Guidelines for both Options

- Submission: BrightSpace
- File name: sps<year>_<group_id>_report1_optionX.pdf
- Max 2 pages including figures, tables and references. Single or double column. We will NOT look at any information beyond 2-pages.
- Only one member of the group needs to submit the report.
- At the top of the report mention
  - your group id, names and student ids, phone used, and version of android
  - provide pointers for code you copied/modified.
  - describe who did what in a concise manner.

Guidelines Specific for Option 1

1) Method
- For activity recognition: describe your activity-X
- For both, activity recognition and localization: describe the features used for RSS and ACC, and the reasoning for selecting those features.
- For both: describe the classifier. If you use KNN, provide only information about the parameters (e.g. K and distance metric used, and why you choose them). Do NOT describe KNN. In general do no describe things that were already presented in class, only describe what is new.

2) Evaluation Setup
- Describe Training method: environment used.
    - For activity recognition: where the phone is located (what part of the body).
    - For localization: layout of your apartment/building, size of cells.
    - For both: window size/number of samples collected for training.
- Describe Testing process.
    - For activity recognition: if the users were the same for testing and training, or if different people were utilized in both phases.
    - For localization: position within cell when you localize yourself (the most obvious choice is the center of the cell)
    - For both: number of samples evaluated

3) Analysis of results
- Accuracy in detecting activity and location
- Use confusion Matrix
- Show GUI of your App

4) References & Other relevant information

Evaluation Criteria

- Description of method

- Accuracy of results

- Presentation

- Innovation (new ideas that you bring to the table to solve elaborated problems. For example, by choosing a complex activity, smaller cells for localization, or proposing new techniques that were not taught in the lectures)

Guidelines Specific for Option 2

1) Introduction

- Describe your Apps goal

2) Challenges

- Identify the 'key' challenges/difficulties for developing the proposed App.

3) Methods

- What methods (e.g. KNN, Particle filters) are you planning to use to solve the abovementioned challenges

4) Preliminary results

- Describe set up and preliminary results.

5) References & Other relevant information