Introduction of Group Projects

Process

• Form up a group and pick a topic
• Initial project introduction
• Requirement analysis
• Software design-I
• Software design-II
• Final project presentation
Form a Group & Pick a Topic

• Due 11:59pm, Sep. 16th
• Team (3-4 people)
• Predefined topics
  – Requirements are described in natural languages
  – They are not specifications, without much detail, feel free to add/delete things
• Other topics
  – Propose and get approval of the instructor

Initial Project Presentation

• One or all members of each team present the project
  – To describe the project/the system to build in terms of requirements and design
• Other groups may ask questions
  – Feasibility, domain knowledge, responsibility separation, etc.
• Duration: 15-20min
Requirement Analysis

• Deliverable
  – Fully dressed use cases
  – Use case diagrams
  – Conceptual class diagrams
  – Supplementary specifications
• Due Date 10/26/2015 11:59pm

Design-I

• Deliverable
  – Class diagram
  – Data design
    • ER diagrams, tables
• Due Date 11/11/2015 11:59pm
Design-II

• Deliverable
  – UI design
    • Mock UI
  – Algorithm design
    • Pseudo-code
• Due Date 11/30/2015 11:59pm

Presentation

• One or all members of each team presents the work
• Duration: 15-20 mins
Evaluation

• Documentation
• Process
• Presentation
• Group peer review
• Member peer review

Documentation Quality

• Correctness
• Clearness
• Well organized structure
• A lot of details
• At least 16 major functional requirements – 4 for each member on average
• Some nonfunctional requirements
• At least 1 interesting algorithm design
• Novelty/Domain knowledge in the project
## Process Quality

- **Version-control & issue tracking**
  - Create a project on bitbucket
  - Add me and Mohammed as users
- **Reasonable progress**
- **Maturity of commit**
- **Use of issue tracking**

## Presentation Quality

- **Introduce the project and responsibilities of each member**
- **Answer questions from the audience**
Projects

• Smart Home System
• Virtual Stock Market Game
• Web-based Stock Forecasters
• Location-aware Purchase Recommendation
• Restaurant Automation

Smart Home System

• Access control
  – Intrusion detection
    • Leverage camera, sensor, light, RFID (Radio frequency identification) tags
  – Authenticate
    • Check whether you are who you claim to be?
  – Validate
    • Check whether you are supposed to be entering this house?
• Lock control
  – Key checker
  – Open/Close the door (main entrance, garage door)
• “live-in look” control
  – Use timers to control lights, televisions, a/c, and sound
• Remote controller
• Status report
  – Send emails/phone calls to home owners/police when intrusion happens
  – Send status report periodically to owners when they are away for vacation

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**Virtual Stock Market Game**

• A website which allows investor players to make virtual investments in real world stocks using fantasy money
• Each player has a personal account with a fixed amount of startup funds—fantasy money
• The system tracks actual stock prices via a third-party system
• Advertisers pay fees for displaying advertisements
• The system displays advertisements when players navigate to a new window
• Award 10% of advertisement profits to the best player of the month
• Provide stock buying recommendation
  – Players who bought this stock also bought these five others

Web-based Stock Forecaster

• A web service which tracks different stocks, and when queried, issue a forecast about the price movement for a given stock
  – Factors considered to predict
    • Stock prices, trading volumes, general economic indicators, etc.
  – Prediction algorithms
  – Suggested actions: buy, sell, hold, sit-out, amount
The client module acts as a “facilitator” to gather information from multiple Web services (“independent experts”) and combines their answers into a single recommendation.

- If conflict answers, repeat the process of querying and combining results.
- Real-time response/decision.

Location-aware Purchase Recommendation

- A phone app to track and influence people’s buying habits.
- Each time a user visits a store and buys grocery items, the app connects to the store’s website to query his/her item list.
- Identify buying habits:
  - Identify correlation between items bought together to suggest things to buy.
• Customers create a to-buy list
  – Suggest where to go to buy these things
• Navigate customers to find all items

Restaurant Automation

• Record of employees
  – Managers fire or hire an employee
• Menu management
  – Promotion
• Customer records
• Dish promotion & suggestion
• Order management
  – Place an order, update items
• Keep track of waiting time of each table
• Inventory management
• Send notification to suppliers