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

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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

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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

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Requirement Analysis

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

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Design-I

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

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Design-II

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

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Presentation

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

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Evaluation

- Documentation
- Process
- Presentation
- Group peer review
- Member peer review

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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

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Process Quality

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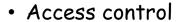- Use of issue tracking

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Presentation Quality

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

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Projects

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

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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?

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- 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

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- 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

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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

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- 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

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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

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- Customers create a to-buy list
  - Suggest where to go to buy these things
- Navigate customers to find all items

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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

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- Keep track of waiting time of each table
- Inventory management
- Send notification to suppliers

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