

Introduction of Group Projects

Process

- Form up a group
- Define a project
- Initial project introduction
- Requirements analysis
- Software design-I
- Software design-II
- Final project presentation

Form a Group

- Due 11:59pm, Sep. 4th
- Team (4-5 people)

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Define a Project

- Due 11:59pm, Sep. 23rd
- Predefined projects
 - Requirements are described in natural languages
 - They are not specifications, without much detail, feel free to add/delete things
- Other projects
 - Propose and get approval of the instructor

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Initial Project Presentation

- **Presentation Dates:**
 - Sep. 25th, Sep. 30th, and Oct. 2nd
- 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: 10-12min

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Requirement Analysis

- Deliverable
 - Fully dressed use cases
 - Use case diagrams
 - Conceptual class diagrams
 - Supplementary specifications
- **Due Oct. 23rd, 11:59pm**

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Design-I

- Deliverable
 - Class diagram
 - Data design
 - ER diagrams, tables
- Due Nov. 11th, 11:59pm

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Design-II

- Deliverable
 - UI design
 - Mock UI
 - Algorithm design
 - Pseudo-code
- Due Dec.2, 11:59pm

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Presentation

- **Presentation Dates:**
 - Dec. 4th, Dec. 9th, Dec. 11th
- One or all members of each team presents the work
- Duration: 10-12 mins

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Evaluation

- **Documentation**
 - Requirement: 10 points
 - Design I: 9 points
 - Design II: 8 points
- **Presentation**
 - Initial: 5 points
 - Final: 5 points
- **Process**
 - Usage of GitHub repository: 2 points
 - Usage of issue tracking system: 1 point
- **Group peer review**
- **Member peer review**

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Documentation Quality

- Correctness
- Clearness
- Well organized structure
- A lot of details
- At least 16 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 GitHub
 - Include the link in all documents you will submit
- Reasonable progress

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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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