DESIGN:

Player Class:

variables:

- int[] resources (see note at bottom)
- int roadcount
- int citycount
- int settlecount
- String name username
- int victory points
- int army size
- int longest road
- boolean isActive

methods:

- rollDie()
- setters and getters

Resources will be an int array with set indices for each resources:

- 0 - Wheat
- 1 - Sheep
- 2 - Brick
- 3 - Ore
- 4 - Wood

---------- (not included in array but still needed)

- 5 - Desert (for painting and initial robber placement)
- 6 - Water (for painting)

Ports:

- 0 - Wheat
- 1 - Sheep
- 2 - Brick
- 3 - Ore
- 4 - Wood
- 5 - “3-1”
- 6 - NO PORT

Numbers (for resource distribution):

- 0 - Water/Desert

Referee:

variables:

- int road
- int army

boolean gameOver
Player active
methods:
endTurn()
calculateVP()
startTurn()
rollDie()
distributeResources() -- infinite resources
trade(Player p1, Player p2, int[] p1r, int[] p2r)
endGame()

tutorial referee extends referee
networked tutorial referee extends tutorial referee

Game Class -- one instance per player, JFrame, top-level for clients:
variables:
list of Players
Board board
build menu
trade menu
devcard display
methods:
updateBoard(Board b)
updatePlayers(list of Players)

Server Class: (SHOULD BE COMBINED WITH REFEREE)
variables:
Board masterBoard
Referee r
ClientPool (contains a list of ClientManagers)
Chatbox cb
methods:
updateClient()
startGame()
cleanup()

ClientManager Class:
Variables:
Player _p
Socket _client
ObjectInputStream _in
ObjectOutputStream _out
methods:

send(Packet packet)
sendError(String msg)
getPlayerName()

Packet Class:
variables:
int _type
Object _o
boolean accessed

Chatbox Class:
variables:
jtextfield
jtextarea
jbutton (send)
methods:
sendMessage()

Client Class:
variables:
Game g
Chatbox cb
Player p
boolean isActive
methods:
updateGame(Board b, list of players)
updateChat(Chatbox cb)

Board Class
variables:
Tiles[10][10] tiles
Node[22][22] nodes
Edge[22][22] edges
methods:
Edge[][] getEdges()
Node[][] getNodes()
Tiles[][] getTiles()

Tile class extends Component:
variables:
public final int number (for resource distribution)
public final resource
6 references to nodes (array)

boolean hasRobber
methods:
boolean isWater()
boolean hasRobber()
Node[] getNodes()
Node getNode(int index)
void setRobber(boolean b)

Edge class extends Component:
variables:
2 references to start/end nodes (array)
boolean isRoad
reference to owner (Player class)
methods:
boolean isRoad()
Player getOwner()
Node[] getNodes()
Node getNode(int index)
void setOwner(Player p) -- also handles setting isRoad and disables listener

Node class extends Component:
variables:
3 references to adjacent tiles (array)
3 references to adjacent edges (array)
int victoryPoints
boolean isOwned
reference to owner (Player class)
port type
methods:
boolean isOwned()
void setOwner(Player p)
Player getOwner()
Tile[] getTiles()
Tile getTile(int index)
Edge[] getEdges()
Edge getEdge(int index)
void setVP(int pts)
int getVP()
Port getPort()
void addTile(Tile t)
void addEdge(Edge e)

Devcard Interface

execute();

Knight class extends component implements Devcard:

Monopoly class extends component implements Devcard:

Roadbuilder class extends component implements Devcard:

YearOfPlenty class extends component implements Devcard:

Devcard Factory

App Class -- Highest level, instantiates menus to launch game

Settings Class:
variables:
- 3 jradiobuttons (window size)
- jtextfield (default port)
- jbutton (submit default port)
- jtogglebutton (help messages on/off)
- jbutton (go back)

methods:
- associated listeners

MainMenu Class:
variables:
- jframe
- jpanel
- 5 buttons:
  - host
  - join
  - settings
  - profile
  - quit

methods:
- associated listeners

Host menu:
variables:
- jtextfield (port)
- jtogglebutton (# of players -- 3 or 4)
- jbutton (submit)

methods:
    associated listeners

Join Menu:
variables:
    jtextfield (host ip)
    jtextfield(port number)
    jbutton (submit)
    jbutton (go back)

Profile Class:
variables:
    jtextfield (nickname entry)
    jbutton (nickname entry)
    jtextarea (stats)
    jbutton (go back to main menu)
methods:
    associated listeners

Trade menu:
variables:
    two rows of dropdown menus (from 0 to max quantity player_ has)
    submit button
methods:
    associated listeners

Build menu:
variables:
    4 buttons (grayed if Player can't afford)
methods:
    associated listeners

Devcard menu:
variables:
    list of devcards
methods:
    associated listeners

TESTING:
-- board construction
    can we create random board patterns that match requirements? (does our layout algorithm work as it should?)
    can we access specific nodes/edges and see their values? (the basics of building)

can we click specific nodes/edges and change their values? (the basics of building)

-- trading

accept a trade in one client and evaluate if the pop-up closes in the other clients and evaluate whether trade was successful (by checking resource arrays)

decline a trade in one client and evaluate if the pop-up does not close in the other clients

offer a trade that one client cannot accept and verify that they cannot accept it

-- making moves (trade, devcard, build, end turn)

given a master board of a known state and a known move, verify that the referee applies the move to the board correctly

verify that the referee only applies valid moves, and informs the player of invalid moves

-- building

client-side: only let player build things that they have enough resources for

build road, make sure that values for longest road are updated correctly

if build road results in new longest road holder, ensure that vps are removed from former owner and rewarded to new owner in server and all clients

-- devcard

“play knight”, ensure that their global (in server, and all clients) army is increased and ensure their global devcard count decreases (ditto for victory points)

“play knight” that gives largest army, ensure that vps are removed from former owner and rewarded to new owner in server and all clients

-- chat box

can the chat receive normal, ‘chat’-type messages from players?

can the chat receive ‘chat’-type messages intended for just one player (PM)?

can the chat send all types of messages to all players?

-- networking

create an object with specific fields on one client, send it to another, and assert that the fields have not changed

update an object in the server and verify that it changes in the clients

ensure that if a client exits or a connection is lost, game ends appropriately

-- robber

ensure that if 7 rolled or knight played, robber is moved and random card drawn from players with settlements on new robber tile

-- resource distribution

ensure that when dice are rolled, resources are distributed appropriately for the roll

-- end game:

ensure that when a player hits 10 vps, game over pop-up appears until user closes, at which point user is returned to menu screen

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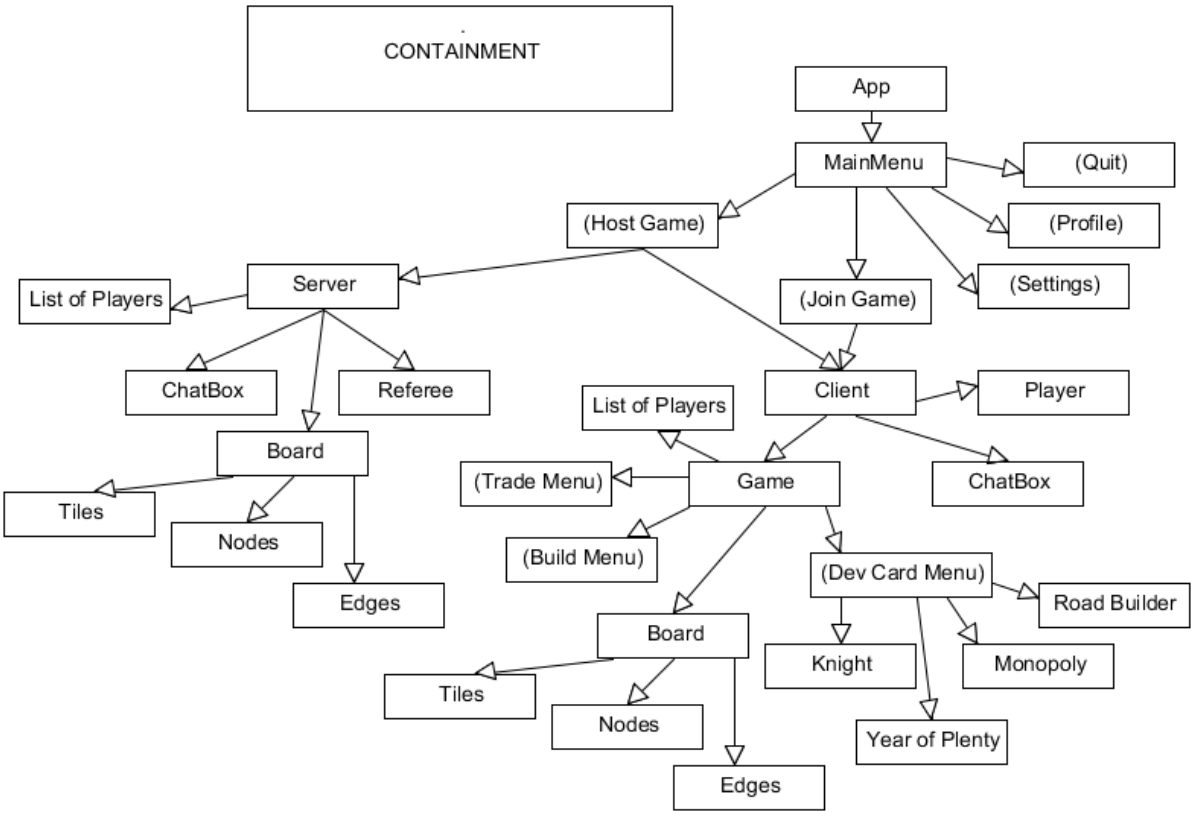
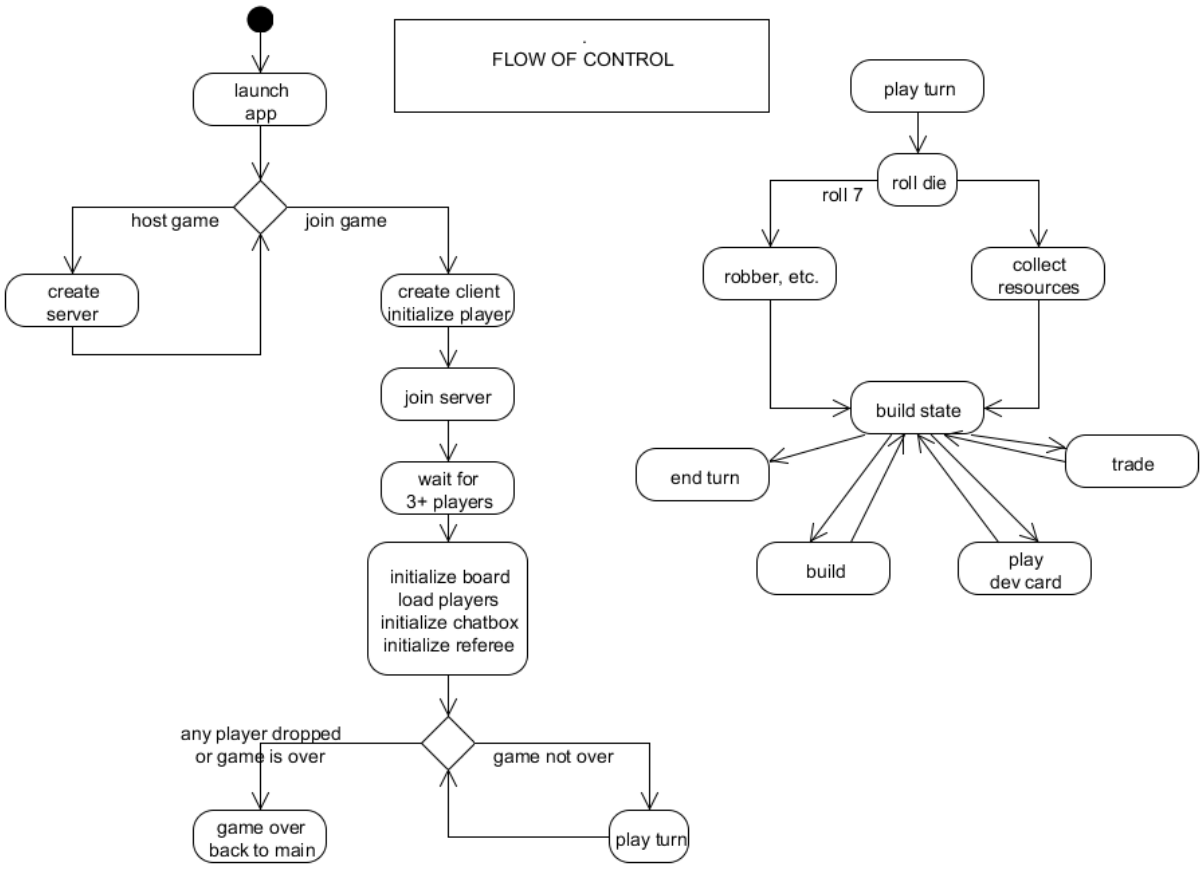
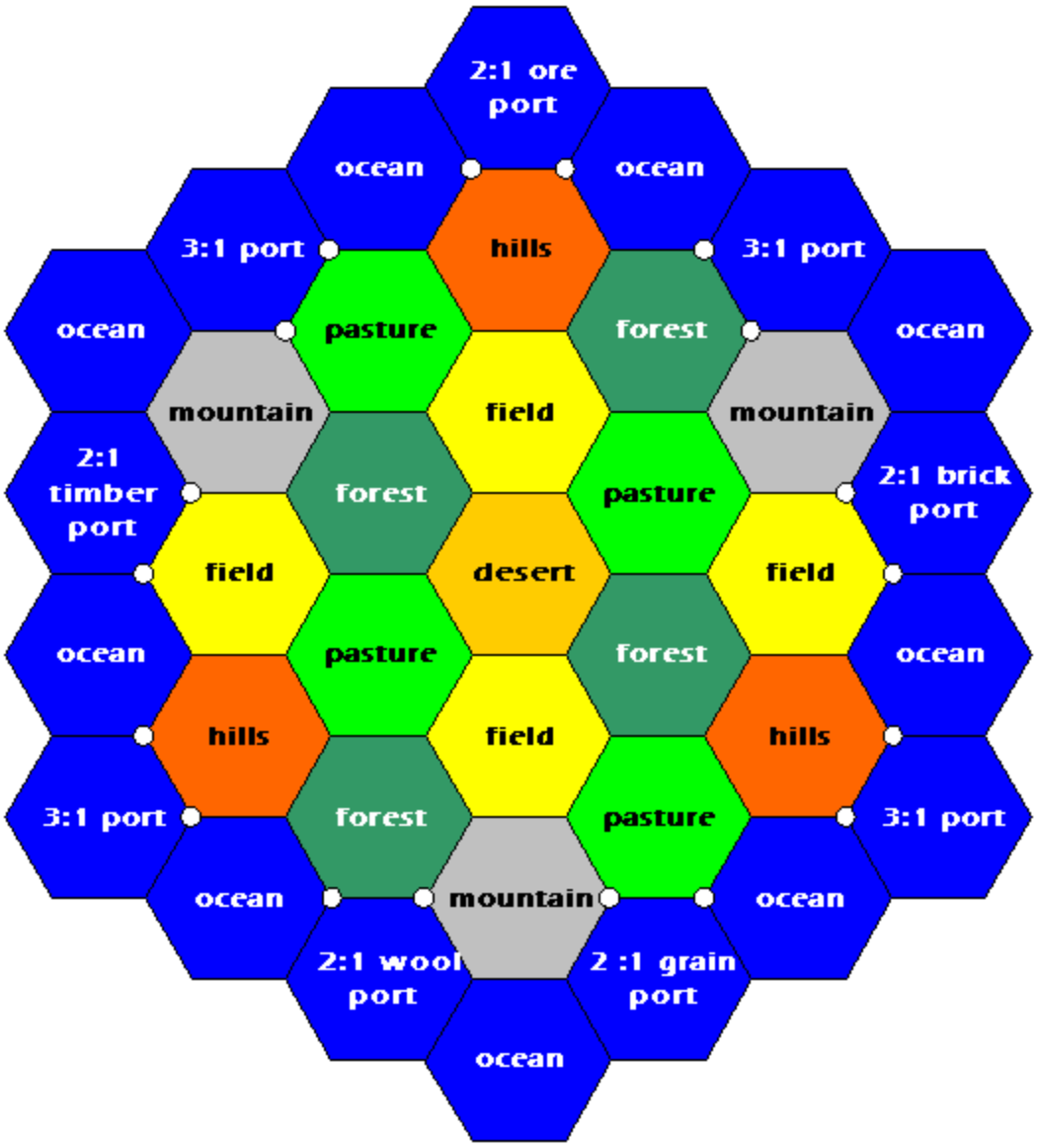

CONTAINMENT
App
MainMenu
(Quit)
(Host Game)
(Profile)
(Settings)
(Join Game)
Server
List of Players
ChatBox
Referee
Board
Tiles
Nodes
Edges
Client
Player
List of Players
(Trade Menu)
Game
ChatBox
(Build Menu)
(Dev Card Menu)
Road Builder
Board
Knight
Monopoly
Tiles
Nodes
Year of Plenty
Edges


FLOW OF CONTROL
launch app
host game
join game
create server
create client initialize player
join server
wait for 3+ players
initialize board
load players
initialize chatbox
initialize referee
any player dropped or game is over
game not over
game over back to main
play turn
play turn
roll die
roll 7
robber, etc.
collect resources
build state
end turn
trade
build
play dev card



http://stackoverflow.com/questions/5040295/data-structure-for-settlers-of-catan-map

Coding Milestone for Settlers of Catan

Basic Idea

We will be implementing an electronic, networked version of Settlers of Catan using the standard rules. Players should be able to connect to each other, talk to each other through a chat system, and trade with each other. Furthermore, the board will be “interactive” in the sense that when a player is trying to build or move the robber, they can click the map to make the change. A game will be completed when a player reaches 10 victory points or if one of the users drops out (lost connection). No matter how the game ends, the game should take the player back to one of the menu screens.

Division of Labor

While we expect all members to be working on all of the parts (particularly the GUI and game board), we have decided to break the project into the following parts:

- Networking - Setting up a host server and allowing multiple clients to connect to it to play the game. The server will communicate with its clients through a specialized protocol and through the chat box. The server will also send updates that the human clients can read through the chat box (Alex)
- Game Logic - This will check the validity of a given move based on a players resources and board positioning. (Thomas)
- Game board and GUI - Menus for settings and hosting game and such. In game menus for building and trading. Visually displaying the board

Milestone 1 rubric

- Set up server that can accept multiple clients at a time (Alex)
- Communication between client and server (Alex)
- All game logic except corner cases (Thomas)
    - internal board representation
    - server and client referees
    - move checking
- Mock-ups of menu screens (Sam/Eric)
    - Main
    - Join
    - Host
    - Profile
    - Settings
    - Placement of swing components
    - Empty listeners
- Mock-ups of assorted pop-ups (Sam/Eric)
    - Trade
    - Build
    - Monopoly
    - Year of Plenty
    - Placement of swing components

    - Empty listeners
- Mock-up of Tile (Sam/Eric)
- Mock-up of Edge (Sam/Eric)
- Mock-up of Node (Sam/Eric)

SECOND MILESTONE (Thursday April 17th)
Playable game with building and rolling only (one player can build, others only get cards)

- board class (Sam)
    - decide how exactly Tiles, Edges, and Nodes are stored and accessed
- game logic (Thomas)
    - simple moves to demonstrate that we can alter the state of the board
- Chatbox (Alex)
    - Sending general messages
    - Updates
    - Private messages
- flush out menus (Eric)
    - integrate for networking
    - Launch the app and host new game on one computer, launch app and join game on another computer
- generic game layout (Eric)
    - player info
    - etc...