

# Naval Battle!

Comp-361 : Naval Battle!  
Lecture 2

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# **I want to know ...**

- 1) What do you expect to learn from this course?
- 2) What do you want to learn from this course?

- Students must implement Naval Battle:
  - ◆ a turn-based strategy game
- Teams of 3,4 or 5 students.
- Students are free to use the technology of their choice to implement the game
- They are four deliverables for this course.

# Naval Battle

- Turn-based strategy game.
- Each player controls a fleet of ship.
- Objective is to sink all opposing ships.
- Player without ships is eliminated.
- Last player left in the game → winner.

# Brainstorm

Similar games?

Videogames

Boardgames

Others?

# Naval Battle (cont.)

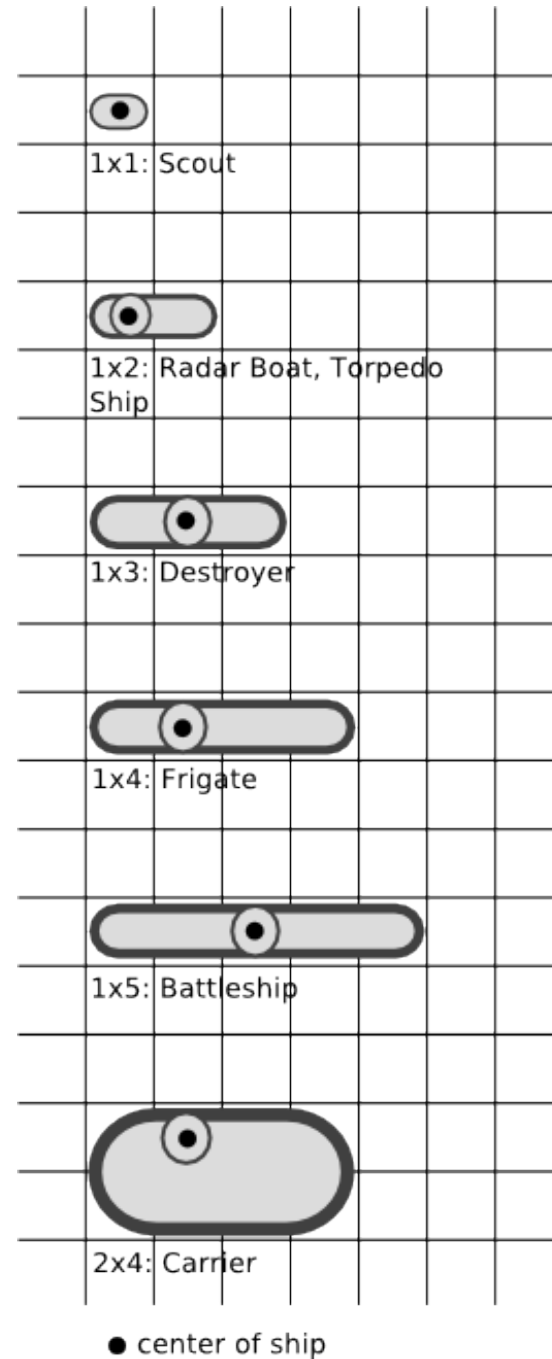
- Phase 1: players choose their fleet using a point allocation system.
- Phase 2: players place their ships he purchased/built in the first phase on the game map.
- Phase 3: each player alternate turn moving their ships and attacking each other.

# Game Map

- A game map is a grid composed of at least 60 by 60 square-shape cells.
- About 15% of the cells on the maps should contain land masses (blocking cells).
  - ◆ The exact distribution of these landmasses is not defined but should be fair to all players.
- The maps should not make the game play repetitive.
- Each map will have a fix number of starting zones assigned to them, each of them at at least 8 by 8 square cells large.

# The Ships

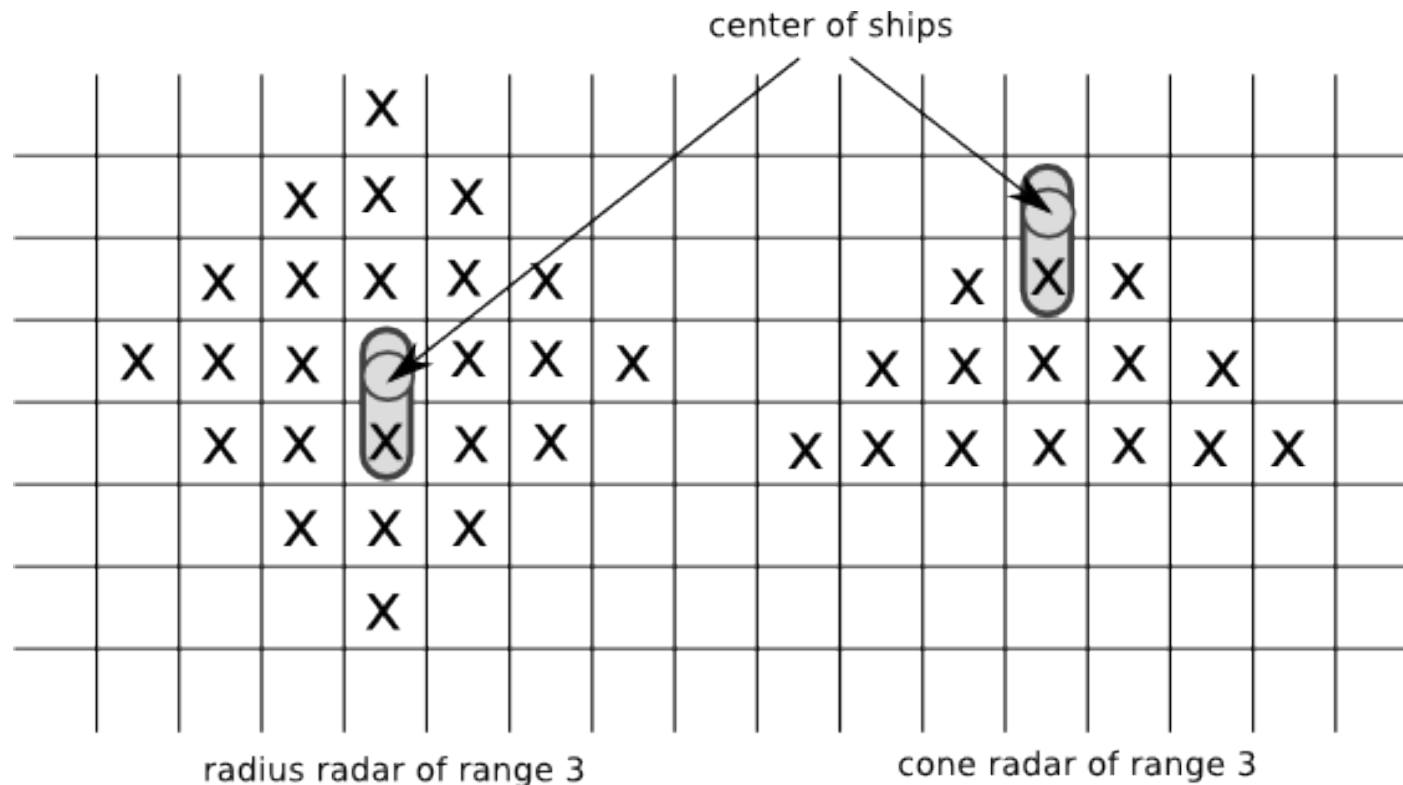
- Center
- Size
- Speed
- Radar
- Health
- Weapons
- Cost





# Radar

- The game map is covered by a shroud of darkness.
- This means players cannot see the contents of a cell, although they can see if the cell has a landmass.
- However, ships are equipped with radars which allows players to see the content of cells around their ships.



# Question

If I don't know what a shroud of darkness (i.e. fog of war) is in a game, what should you do?

# Brainstorm

What games use a shroud of darkness?

# Mini-Assignment

Warcraft 3 demo

<http://www.blizzard.com/us/war3/demo/>

Starcraft demo

<http://www.blizzard.com/us/starcraft/>

# Weapon Systems


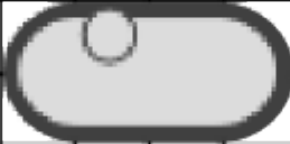
## Weapon Systems

- Shell
- Long Range Shell
- Torpedo
- Mortar
- AirStrike
- Shell Bombardement

## Attributes

- Recharge time
- Damage
- Blocked by landmass and other ships
- Range
- Pattern

# Weapon Range

		6	5	4	3	4	5	6							6	5	4	3	4	5	6					
	6	5	4	3	2	3	4	5	6					6	5	4	3	2	3	4	5	6				
6	5	4	3	2	1	2	3	4	5	6			6	5	4	3	2	1	2	3	4	5	6			
5	4	3	2			2	3	4	5	6			5	4	3	2			3	4	5	6				
6	5	4	3	2	1	2	3	4	5	6			6	5	4	3			4	5	6					
	6	5	4	3	2	3	4	5	6					6	5	4	3	2	3	4	5	6				
		6	5	4	3	4	5	6							6	5	4	3	4	5	6					
			6	5	4	5	6									6	5	4	5	6						

# Damage Patterns

spot attack  
range:5



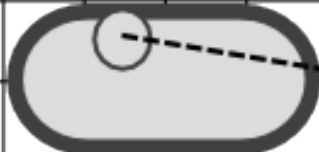
X

X attack  
range:4



X

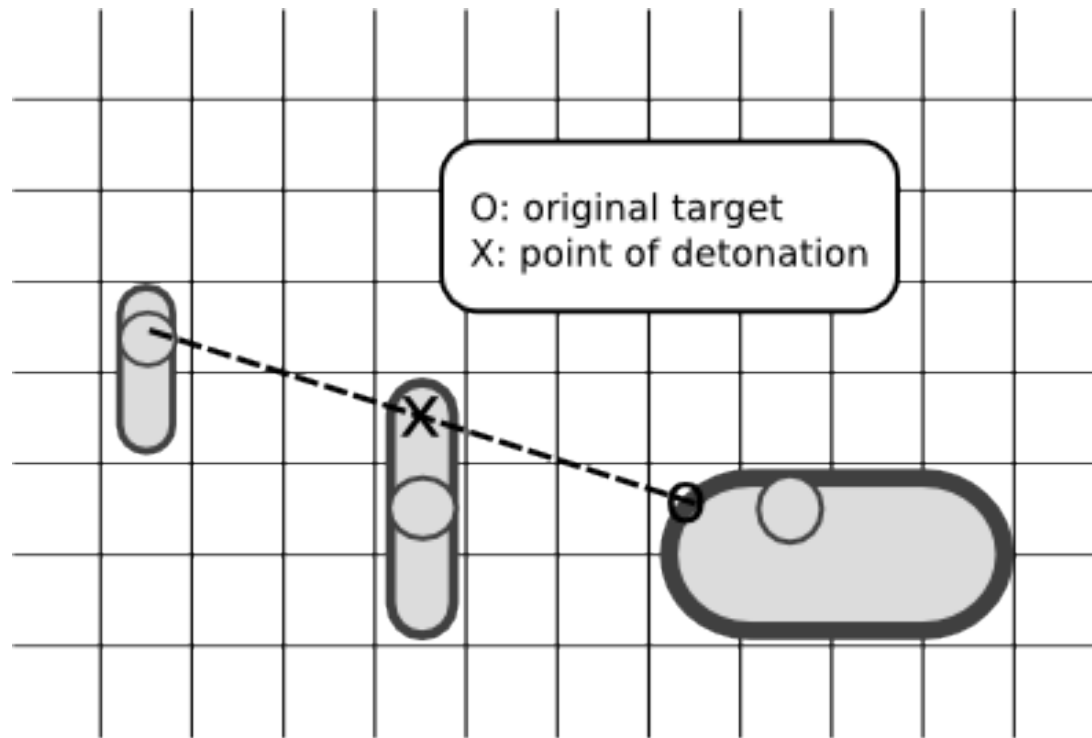
row attack  
range:7



O O O O X

X: target of attack  
O: collateral damage

# Blocked by landmasses/other ships





# Phase 1: Fleet Purchase

- During this phase, players are allowed to purchase up to 1000 units worth of ship.
- A players decision should not be final until he/she has finished all decisions an presses a confirmation button.
- It should be noted that players should not be able to acquire more than two ships of a given type.

# Phase 2: Fleet Positioning

- Each player is assigned a starting zone.
- Players can place their purchased/built ships anywhere (any orientation, horizontal or vertical) in the starting zone.
- All the purchased ships must be able to fit in starting zone.
  - ◆ Otherwise, any excess ships will be discarded.

# Phase 3 : Fleet Battle

- Each players alternate playing their turns.
- During their turn, a player can issue orders to their ships.
- These orders include moving and attack
  - ♦ Attack
  - ♦ Move
  - ♦ Both Move and Attack, in that order
- Ships with recharging weapon systems cannot receive orders.

# Moving a ship

- Each ship can move a fix number of cells.
- Moves are limited to the four cardinal points N,S,E,W.
  - ◆ Moving one cell NE is considered two moves.
- Distances of moves should be calculated from the center of each ship.
- Players get to chose the final orientation of their ship (horizontal or vertical).
  - ◆ The rotation of a ship should also be done from the center of the ship.
- Ships cannot move through or occupy spaces with landmasses or other ships.

# Making an Attack

- Step 1: Chose which weapon system to use.
- Step 2: Select the target cell.
- Attacks are resolved immediately after the order is issued.
- Ships with health bellow zero are considered sunk and are immediately removed from the map.
- Depending on the type of attack, the firing ship might go into recharge mode for a couple of turns.

# Winning the Game

- The game is considered won when only one player has ships remaining in his fleet.
- That player is considered the winner.

# Game Balance

*Game balance is a concept in game design describing fairness or balance of power in a game between multiple players or strategic options.*

*-- Wikipedia*

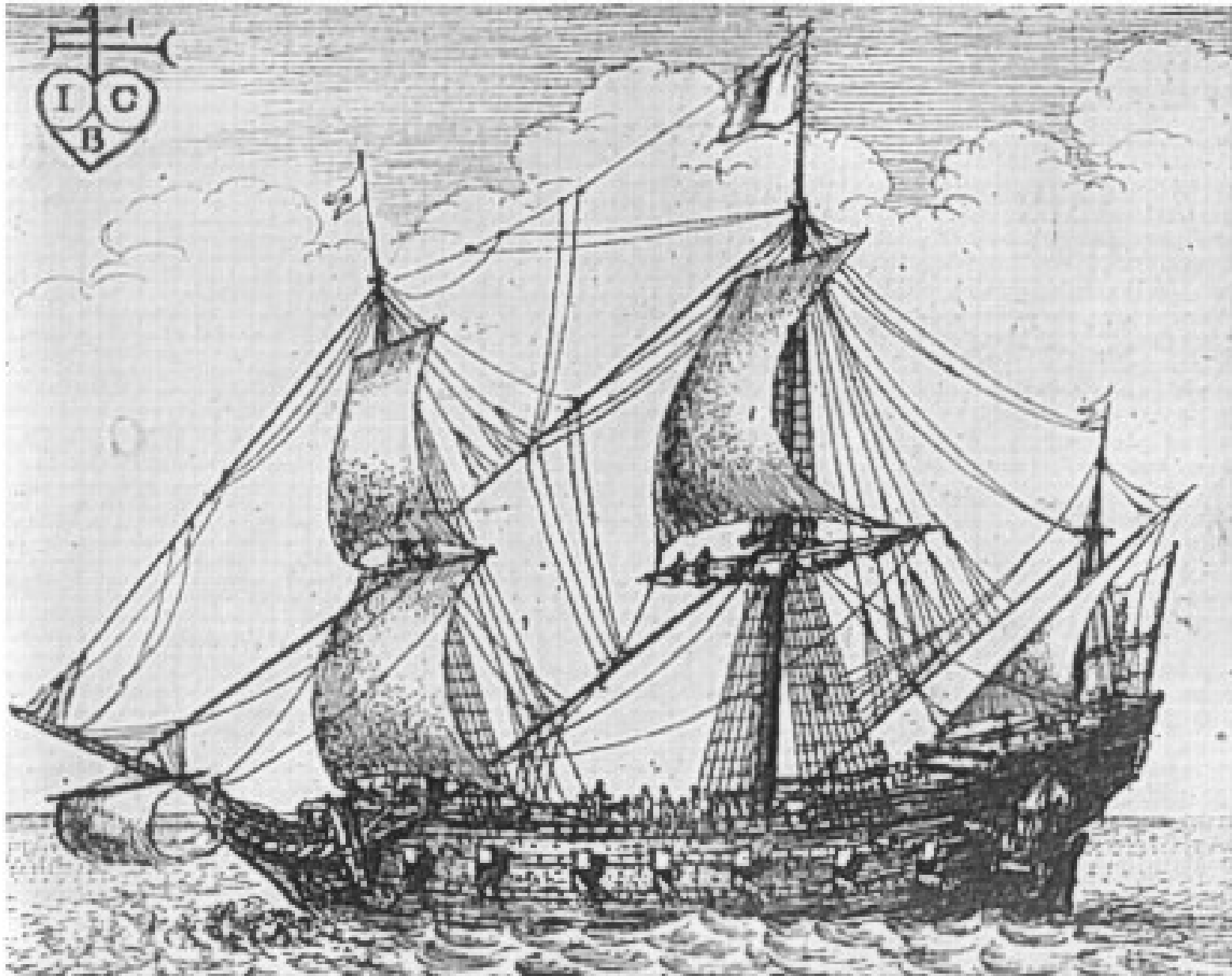
# Naval Battle



<http://www.wallpapergate.com/postcard18675.html>

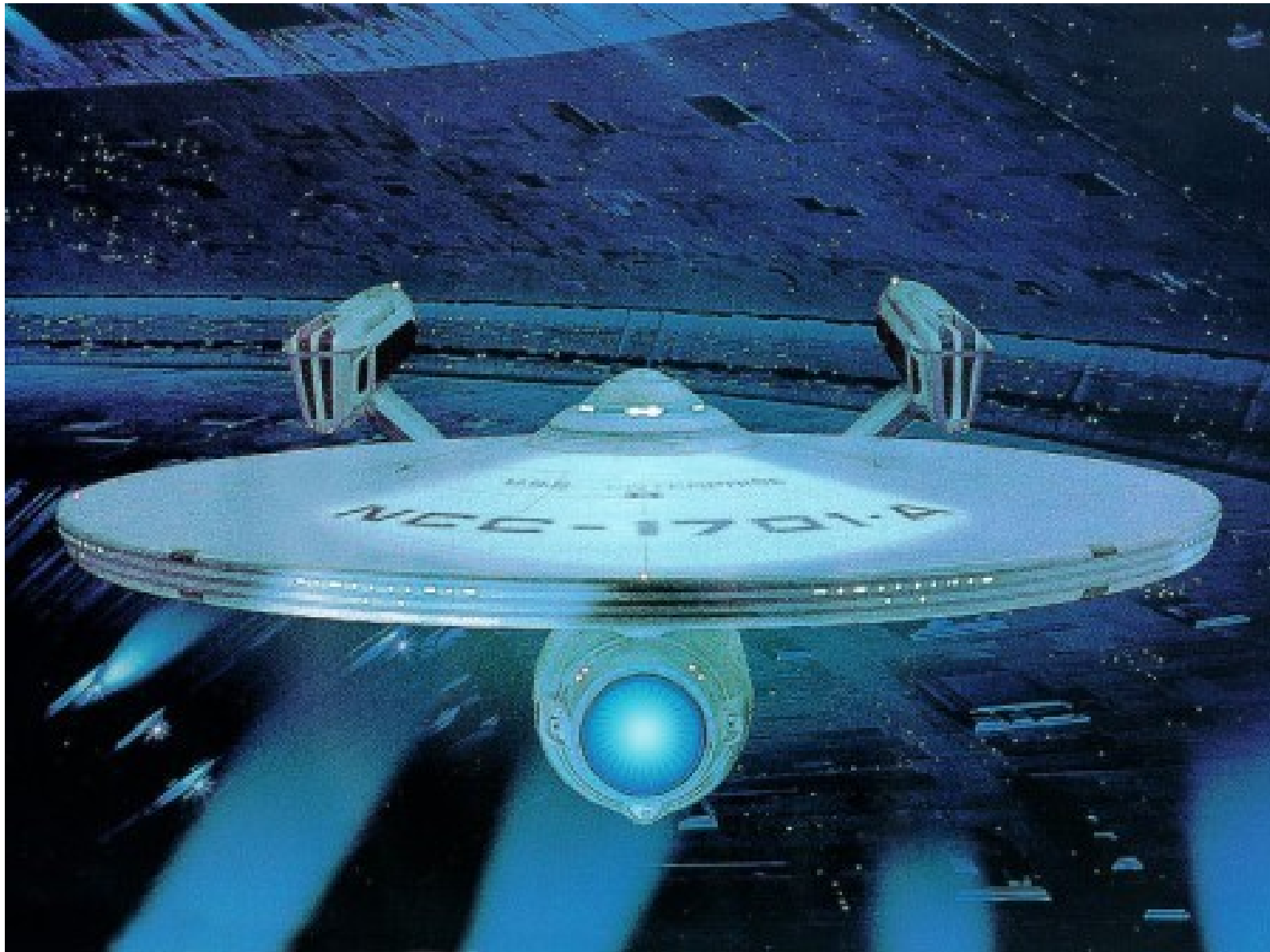


# Naval Battle



<http://web.ukonline.co.uk/lordcornell/iwhr/ship1.gif>

# Naval Battle



<http://i14.photobucket.com/albums/a328/duke-cannon/Wallpaper-StarTrek-USSEnterpriseNCC.jpg>

# Naval Battle



<http://web.mit.edu/newsoffice/2004/raft.jpg>

- Ships in space
- Modern Warfare
- World-War II
- World-War III
- Renaissance Pirate Ships
- Paddle boats in Egypt
  
- Think Monopoly ...

# Design Document

- Shortly after the teams are formed students, will be asked to hand in a short and simple design document.
- The document should not be more than 3 or 4 pages and should include the following:
  - ◆ The name of the team members and how work will be tentatively broken down.
  - ◆ An initial timetable with the team's objective
  - ◆ A simple UML diagram describing the main data structures of the game.
  - ◆ Two drawings illustrating what Phase 1 and Phase 3 of the game might look like.

# Project Demo

- Students will be required to present a demo version of their game.
- During the demo, the group of graders (i.e. my TAs, myself, ...) will not touch the computers, nor interfere with the demo in any way.
- You must demonstrate what your software can do (and do not show what it can not do).
- Feel free to show off your cool features, and do not talk about the bad ones / remaining bugs.
- Successfully demonstrating the game with the strict minimum features and without any crashes will earn you an A- grade.

# Maintenance Phase

- Shortly after the demo, there will be some changes to the game rules.
- This simulates "real-life" software development, in which the application requirements are often subject to change during the development of an application.
- In order to prepare for this phase, try to write structured, modular, extensible code.

# Acceptance Test

- During the test, the group of graders (i.e. my TA, myself, ...) will play your game, looking for bugs/glitches and violations of the game rules.
- During this evaluation, only the graders are allowed to touch the game computers.
- A very detailed and up to date version of these requirements will be released on the course website shortly before.
- Successfully implementing the game with the strict minimum features and without any crashes will earn you an A- grade.



# Going the extra mile

- Multi-player Meeting Room (Game Lobby, like BattleNet)
- Different game modes
  - ◆ (i.e. Scenarios, Capture the flag, etc)
- New units, radar and weapon systems
- Useful tool support
- Etc.

# Final Hand In

- At the end of the term, students will be asked to hand in
  - ◆ a copy of their code
  - ◆ a compiled version of their game
  - ◆ an instruction manual
- The preferred method of handing in this deliverable is in a standard size DVD case with
  - ◆ the code and the game on the optical media (CD or DVD)
  - ◆ the instruction manual inserted into the sleeve of the case
- More information about this deliverable will be given towards the end of the term.

# Changes for Teams of 4 and 5

- Comp-361 project must be completed in teams of 3, 4 or 5 students.
- Most of the game requirements are the same regardless of the size of the team.
- However, to reflect the additional manpower available in teams of 4 and 5, the following changes apply:
  - ♦ A team of 3 students must allow for a multi player game of up to 4 players. Teams of 4 students and 5 students must allow for games of 6 and 8 players respectively.
  - ♦ A team of 5 students is required implement the multi-player Meeting Room expansion idea.



# Question?