Conrad Provan
Part A

1. **acoustic proximity fuze**: a trigger that is triggered when a sound is heard within a specific proximity
   source: [@en.wikipedia.org/wiki/Proximity_fuze#Acoustic]
   category: noun
   data: acoustic sensor (static, used to listen), Trigger (dynamic, activates when sensor reads a specific threshold.)
   control: sensor tells trigger when to activate
   behavior: naval mines utilize an acoustic fuze to detonate.
   role: processing, process incoming data from sensor
   pattern: creational, must be defined, Structural, it's a part of a bigger system
   concern: controller, gets data, and manipulates a model
   difficulty: easy, takes an input, the processes the input and provides an output
   risk: moderate, if done wrong, weapons wouldn't work properly or even at all
   presentation: a check box that is labeled and will be checked when activated

2. **acoustic sensor**: sensors that detect sound via microphone
   source: [@www.sunmantechnology.com/system-ip/acoustic-sensors.html]
   category: noun
   data: Microphone (static, doesn't move)
   control: listens for sound and sends data to system
   behavior: used to detect incoming aircrafts
   role: input, gets data so that the other systems can act on that data
   pattern: creational, must be defined, structural, a part of a larger system
   concern: view, gets input to controller to be processed
   difficulty: hard, code that can locate objects by reflecting waves off them
   risk: high, if done wrong units unable to see underwater
   presentation: small circle with a label, displays details when clicked on

3. **acquisition process**: the process in which a target is acquired.
   source: [@en.wikipedia.org/wiki/Military_acquisition]
   category: noun
   data: target (Dynamic, could be moving location), a retriever (Dynamic, going after the target)
   control: target is the subject of interest, retriever goes to acquire the target
   behavior: units need to preform acquisition process to acquire resources
   role: processing, it's a process
   pattern: behavioral, describes the behavior of an object
   concern: view, to keep track of the location of the object
   difficulty: moderate, has to do with movement of objects
   risk: high, if done wrong, objects might not be able to move corectly
   presentation: dotted line and arrow showing path of movement, labeled

4. **active radar sensor**: a sensor that uses a radar transmitter and a receiver, to locate objects
   source: [@en.wikipedia.org/wiki/Radar]
   category: noun
   data: receiver (static, it does not move), transmitter (static, it does not move)
   control: it can send radar waves to identify useable obstacles
   behavior: used to identify enemy units.
   role: input, gets data so that the other systems can act on that data
   pattern: creational, must be defined, structural, a part of a larger system

concern: view, gets input to controller to be processed
difficulty: hard, code that can locate objects by reflecting waves off them
risk: high, if done wrong units unable to see underwater
presentation: small circle with a label, displays details when clicked on

5. **active sonar sensor**: a sensor that uses a sound transmitter and a receiver, to locate objects
   source: [@en.wikipedia.org/wiki/Sonar#Active_sonar]
   category: noun
   data: receiver (static, it does not move), transmitter (static, it does not move)
   control: it can send sonar waves to identify useable obstacles
   behavior: used to identify enemy units.
   role: input, gets data so that the other systems can act on that data
   pattern: creational, must be defined, structural, a part of a larger system
   concern: view, gets input to controller to be processed
   difficulty: hard, code that can locate objects by reflecting waves off them
   risk: high, if done wrong units unable to see underwater
   presentation: small circle with a label, displays details when clicked on

6. **actuator**: a component of a machine that is responsible for moving and controlling a mechanism or system
   source: [@en.wikipedia.org/wiki/Actuator]
   category: noun
   data: Control signal (dynamic, the signal can change) source of energy (static the source of energy doesn't move)
   control: it can convert energy into mechanical motion
   behavior: an actuator can open a valve when signaled to
   role: output, it preforms an action once it receives a signal
   pattern: creational, it must be defined, structural, it is part of a larger system.
   concern: model, it gets manipulated, controller, it manipulates
   difficulty: moderate, must take in input, and execute and action
   risk: high, if done wrong, actions could have unwanted consequences
   presentation: a small switch that lights up when activated

7. **attenuation**: the reduction of the amplitude of a signal, electric current, or other oscillation.
   source: [@en.wikipedia.org/wiki/Attenuation]
   category: noun
   data: material (Static, the material doesn't change) the waves (Dynamic, change as the pass through the material)
   control: can be used for sound dampening
   behavior: used in ships for dampening the sound of the motors
   role: output, it's a result of waves moving through a material
   pattern: behavioral, describes the behavior of waves
   concern: controller, controls the way waves interact with different substances
   difficulty: hard, there are many different waves and different materials to account for
   risk: moderate, relatively simple code
   presentation: show the waves fade while going through an object

8. **battleship**: a heavy warship with extensive armor and large-caliber guns.
   source: [@en.wikipedia.org/wiki/Battleship]
   category: noun
   data: Movement (Dynamic, changing location), Attacking (Dynamic, firing weapons)

control: it can fire weaponry, and travers the water
behavior: it's used in military operations to attack enemy naval units
role: output, military unit used to attack and defend on water
pattern: creational, because it must be defined
concern: model because its manipulated, view because we need to see the state
difficulty: hard, it involves motion
risk: high because it involves code for motion, shooting, and targeting
presentation: a labeled green 2D outline of a boat

9. **bomb**: an explosive weapon, utilizing the exothermic reaction of explosive material
source: [@en.wikipedia.org/wiki/Bomb]
category: noun
data: explosive material (Dynamic, explodes), fuze (Dynamic, triggers the explosion)
control: it can explode
behavior: used to cause extreme damage from a distance
role: output, causes an explosion
pattern: creational, because it must be defined, structural because they can be part of other weapons
concern: model, because it gets manipulated, view to see its state
difficulty: moderate, it involves code that effects the surrounding area
risk: high, could detonate premature, or not at all
presentation: large red circle, labeled

10. **bomber aircraft**: a military aircraft that attacks ground targets by dropping bombs
source: [@en.wikipedia.org/wiki/Bomber]
category: noun
data: Movement (Dynamic, changing location), Attacking (Dynamic, firing weapons)
control: it can attack ground targets by dropping bombs on them
behavior: it's used to cause heavy damage to ground targets with low risk to the actual unit
role: output, military unit used to attack ground from air
pattern: creational, because it must be defined
concern: model because its manipulated, view because we need to see the state
difficulty: hard, it involves motion
risk: high because it involves code for motion, shooting, and targeting
presentation: a labeled green 2D outline of a plane

11. **countermeasure**: a measure or action taken to offset another action
source: [@en.wikipedia.org/wiki/Countermeasure]
category: noun
data: movement (Dynamic, changing location)
control: it can offset another action
behavior: used to prevent an undesirable outcome
role: output, an action taken in response to another action
pattern: behavioral, its how an object responds
concern: view, has to do with the state of the object
difficulty: hard, has to do with motion and interaction with other objects
risk: high, if done wrong, countermeasures could fail or not work
presentation: dotted line and arrow showing path of movement, labeled

12. **cross-section/reflectivity**: a measure of an objects' reflectivity
source: [@copradar.com/chapts/chapt3/ch3d6.html]

category: noun
data: reflectivity (Static, a property of an object)
control: knowing the reflectivity allows us to tell the type of material
behavior: used to tell whether something on the radar is a threat or not
role: input, data that other systems can act on
pattern: structural it is a component of another object
concern: view, sends data to the controller
difficulty: easy, just a simple property
risk: moderate, if done wrong can cause objects to be distinguished incorrectly
presentation: I don't see a need to have a visual of this one

13. **defensive maneuver**: a type of movement employed to deny an attack from enemy weapons or units
    source: [@www.flightsimbooks.com/f15strikeeagle/05_04_Defensive_Maneuvers.php]
    category: noun
    data: attacker (dynamic, attacking), defender (Dynamic, changing location)
    control: movement to deny incoming attacks
    behavior: captains use defensive maneuvers to evade enemy fire
    role: output, it's a result of the input of the captain
    pattern: behavioral, it is a way to manipulate an object
    concern: view, has to do with the state of the ship
    difficulty: moderate, involves motion of an object
    risk: high, it involves motion
    presentation: dotted line and arrow showing path of movement, labeled

14. **depth charge**: an anti-submarine warfare weapon
    source: [@www.ussslater.org/tour/weapons/dpthchrg/dpthchrg.html]
    category: noun
    data: depth fuze (Dynamic, triggers explosion), charge (Dynamic, explodes)
    control: it can explode at specific depths
    behavior: used to attack submarines
    role: output, a weapon used in response to nearby enemies
    pattern: creational, because it must be defined
    concern: view, to see state, model, because it is manipulated
    difficulty: easy, takes in data and acts on the data
    risk: moderate, if done wrong the charge could detonate to early
    presentation: large red circle, labeled

15. **depth fuze**: a trigger that activates at a designated depth
    source: [@en.wikipedia.org/wiki/Fuze]
    category: noun
    data: depth sensor (static, recording data), trigger (Dynamic, activates)
    control: it can trigger a weapon to fire once something enters a specific depth.
    behavior: it is used to cause weapons to activate once a target enters a specific depth.
    role: processing, it takes in an input and gives out an output
    pattern: behavioral, communicates between two objects
    concern: controller, updates the object it's connected to after receiving input
    difficulty: easy, takes an input, the processes the input and provides an output
    risk: moderate, if done wrong, weapons wouldn't work properly or even at all
    presentation: a check box that is labeled and will be checked when activated

16. **destroyer**: a fast, maneuverable, and long-endurance warship

source: [@en.wikipedia.org/wiki/Destroyer]
category: noun
data: Movement (Dynamic, changing location), Attacking (Dynamic, firing weapons)
control: protects larger ships, attacks enemy ship
behavior: attacks other ships, maneuvers in water
role: output, military unit used to attack and defend in the water
pattern: creational, because it must be defined
concern: model because its manipulated, view because we need to see the state
difficulty: hard, it involves motion
risk: high because it involves code for motion, shooting, and targeting
presentation: a labeled green 2D outline of a boat

17. **distance fuze**: a trigger that activates at a designated distance from a target
source: [@en.wikipedia.org/wiki/Fuze#Proximity_fuze]
category: noun
data: distance sensor (Static, records data), trigger (Dynamic, activates)
control: it can trigger a weapon to fire once something enters a specific distance.
behavior: it is used to cause weapons to activate once a target enters a specific distance.
role: processing, it takes in an input and gives out an output
pattern: behavioral, communicates between two objects
concern: controller, updates the object it's connected to after receiving input
difficulty: easy, takes an input, the processes the input and provides an output
risk: moderate, if done wrong, weapons wouldn't work properly or even at all
presentation: a check box that is labeled and will be checked when activated

18. **engagement process**: the process in which one unit engages another unit
source: [@en.wikipedia.org/wiki/Engagement_(military)]
category: noun
data: a target (Dynamic, it could be moving) engager (Dynamic, moving toward target)
control: the process in which one force engages another force
behavior: describes the way in an object(s) engages another object(s)
role: processing, it's a process that will end with an outcome
pattern: behavioral, have an object behaves
concern: view, how an object moves
difficulty: moderate, has to do with movement of objects
risk: high, if done wrong, objects might not be able to move when needed
presentation: dotted line and arrow showing path of movement, labeled

19. **evasive maneuver**: movement to avoid incoming obstacles
source: [@memory-alpha.wikia.com/wiki/Evasive_maneuvers]
category: noun
data: attacker (Dynamic, attacking) operator (Dynamic, Evading the attacker)
control: movement to avoid incoming obstacles
behavior: captains use evasive maneuvers to evade enemy fire
role: output, it's a result of the input of the captain
pattern: behavioral, it is a way to manipulate an object
concern: view, has to do with the state of the ship
difficulty: moderate, involves motion of an object
risk: high, it involves motion
presentation: dotted line and arrow showing path of movement, labeled

20. **fighter aircraft**: a military aircraft designed primarily for air to air combat
    source: [@en.wikipedia.org/wiki/Fighter_aircraft]
    category: noun
    data: Movement (Dynamic, changing location), Attacking (Dynamic, firing weapons)
    control: flies, and fires weapons
    behavior: used in air to air military operations
    role: output, military unit used to attack and defend in the air
    pattern: creational, because it must be defined
    concern: model because its manipulated, view because we need to see the state
    difficulty: moderate, it involves motion
    risk: high because it involves code for motion, shooting, and targeting
    presentation: a labeled green 2D outline of a plane

21. **lethality process**: the process in which something is lethal
    source: [@en.wikipedia.org/wiki/Lethality]
    category: noun
    data: a weapons lethality (Static, value)
    control: the process that makes a weapon lethal
    behavior: a missile being fired at a target
    role: processing, it's a process
    pattern: behavioral, it describes the behavior of an object
    concern: controller, it manipulates a model
    difficulty: hard, since the process can very based on the weapon or object
    risk: high, if done wrong weapons would not function as expected
    presentation: I don't see a need to have a visual of this one

22. **main battery gun**: the primary weapon or group of weapons around which a warship is designed
    source: [@en.wikipedia.org/wiki/Main_battery]
    category: noun
    data: aiming (Dynamic, changing targets), firing (Dynamic, attacking)
    control: can aim and launch projectiles at targets, dynamic, it moves
    behavior: used to attack enemy units in time of battle
    role: output, it is a weapon that supports in attacking and defending
    pattern: creational because it must be defined, structural because it's a part of warships
    concern: model because its manipulated, view because we need to see the state
    difficulty: moderate, it involves motion
    risk: high because it involves code for motion, shooting, and targeting
    presentation: red labeled cylinder

23. **missile**: guided, self-propelled system with a warhead
    source: [@en.wikipedia.org/wiki/Missile]
    category: noun
    data: guiding system (dynamic, adjusting trajectory), rocket (Dynamic, changing the location), warhead (Dynamic, explodes)
    control: it can propel itself to a target and explode
    behavior: used to inflict large amounts of damage to enemies
    role: output, it's a weapon for destroying stuff
    pattern: creational, because it must be defined, behavioral, because the guiding system
    concern: model, because it's something that's manipulated.
    difficulty: hard, its composed of many sub systems that all must work together
    risk: high risk because of all the different components having to work together

presentation: a labeled green 2D outline of a missile

24. **mobility process**: the process in which a weapons system or combat unit moves
    source: [@en.wikipedia.org/wiki/Mobility_(military)]
    category: noun
    data: location (Static, location to be moved to)
    control: it can move a combat unit to a military objective
    behavior: moving a ship to a location requested
    role: output, its how a ship moves from one location to another
    pattern: behavioral, how a ship behaves
    concern: view, alters the state of the ship
    difficulty: moderate, must deal with moving objects
    risk: moderate, must hand code for movement
    presentation: dotted line and arrow showing path of movement, labeled

25. **munition**: materials of war, weapons, ammunition, armaments
    source: [@en.wiktionary.org/wiki/munition]
    category: noun
    data: materials of war (Dynamic, they get used)
    control: can be used to attack or defend in military combat
    behavior: used in military combat to attack and defend
    role: input, because they get used
    pattern: creational, because they must be defined
    concern: model, they get manipulated
    difficulty: moderate, each one needs to be defined
    risk: high, if done wrong the actions of the munition wouldn't work
    presentation: red labeled square

26. **offensive maneuver**: a type of maneuver to put a ship in an offensive position
    source: [@en.wikipedia.org/wiki/Basic_fighter_maneuvers]
    category: noun
    data: a target (Dynamic, it could be moving) attacker (Dynamic, moving toward target)
    control: helps an attacker get the upper hand in a confrontation
    behavior: a captain uses an offensive maneuver to get the upper had on the enemy ship
    role: output, it's a result of the input of the captain
    pattern: behavioral, it is a way to manipulate an object
    concern: view, has to do with the state of the ship
    difficulty: moderate, involves motion of an object
    risk: high, it involves motion
    presentation: dotted line and arrow showing path of movement, labeled

27. **passive radar sensor**: a sensor that picks up radar waves without giving any off
    source: [@en.wikipedia.org/wiki/Passive_radar]
    category: noun
    data: receiver (Static, reads waves)
    control: reads radar waves that transmit form third party transmitters
    behavior: used to detect objects or enemy ships without being detected
    role: input, it collects data
    pattern: creational because it must be defined
    concern: controller, updates the object it's connected to after receiving input

difficulty: easy, takes an input, the processes the input and provides an output
risk: moderate, if done wrong, weapons wouldn't work properly or even at all
presentation: small circle with a label, displays details when clicked on

28. **passive sonar sensor**: sensor that reads sonar waves without giving any off
    source: [@en.wikipedia.org/wiki/Sonar#Passive_sonar]
    category: noun
    data: receiver (Static, reads waves)
    control: it can listen to sonar waves, without transmitting any
    behavior: used to listen for enemy subs or mines
    role: input, it collects data
    pattern: creational because it must be defined
    concern: controller, updates the object it's connected to after receiving input
    difficulty: easy, takes an input, the processes the input and provides an output
    risk: moderate, if done wrong, weapons wouldn't work properly or even at all
    presentation: small circle with a label, displays details when clicked on

29. **power**: a quantitative measurement of energy
    source: [@https://en.wikipedia.org/wiki/Power_(physics)]
    category: noun
    data: amount of energy (Dynamic, the amount of energy can change)
    control: it can cause damage, be read by sensors, or used to cause actions
    behavior: heat sensors read the amount of power in the form of temperature
    role: input, when being read as data, output when being used to cause an action
    pattern: creational, because it must be defined, structural because it is a part of some objects
    concern: model because it can be manipulated, view so we can see the state
    difficulty: easy, this is more of an attribute to be read
    risk: high, if done wrong interactions between objects can fail
    presentation: I don't see a need to have a visual of this one

30. **radar proximity fuze**: a trigger that activates when radar waves come within range
    source: [@en.wikipedia.org/wiki/Fuze#Proximity_fuze]
    category: noun
    data: radar sensor (static, reads data), trigger (Dynamic, activates)
    control: it can trigger a weapon to fire after once something enters its radar.
    behavior: it is used to cause weapons to activate once an object enters a specific radar.
    role: processing, it takes in an input and gives out an output
    pattern: behavioral, communicates between two objects
    concern: controller, updates the object it's connected to after receiving input
    difficulty: easy, takes an input, the processes the input and provides an output
    risk: moderate, if done wrong, weapons wouldn't work properly or even at all
    presentation: a check box that is labeled and will be checked when activated

31. **sensor**: a data collection device
    source: [@en.wikipedia.org/wiki/Sensor]
    category: noun
    data: sensor (Dynamic, reads data)
    control: can collect data and report that data to another system
    behavior: used to collect data, and report to different systems
    role: input, it collects data
    pattern: creational because it must be defined

concern: view, because it sends input to the controller
difficulty: easy, all it must do is send data
risk: low, not any moving parts
presentation: small circle with a label, displays details when clicked on

32. **sensor fusion**: software made to combine data from multiple sensors
source: [@en.wikipedia.org/wiki/Sensor_fusion]
category: noun
data: data (Static, inputted data)
control: able to combine data from many sensors
behavior: used to combine data do there are less uncertainties
role: processing, because it's manipulating the data it receives.
pattern: behavioral, because its acting on input to perform a function
concern: controller, because it acts on data
difficulty: hard, combining multiple sets of data and making it all work has many ways to fail
risk: high, if done wrong it could cause issues in many other places
presentation: I don't see a need to have a visual of this one

33. **submarine**: a vehicle able to maneuver under and on top of water
source: [@en.wikipedia.org/wiki/Submarine]
category: noun
data: composed of many systems, like maneuvering, weapons, ect (Dynamic, because there is motion)
control: it can dive under water, rise above water, change direction and launch weapons
behavior: they are used to survey waters and create blockades from enemies
role: output, because it is a vehicle used for military practices
pattern: creational because it must be defined, structural because it is made of many parts
concern: model because it is something manipulated
difficulty: hard, because it is made up of many smaller parts
risk: high because if any part is wrong it could cause issues.
presentation: a labeled green 2D outline of a submarine

34. **thermal proximity fuze**: an object to trigger another object do to temperature
source: [@en.wikipedia.org/wiki/Fuze#Proximity_fuze]
category: noun
data: thermal sensor (Static, just collects data) trigger (Dynamic, triggers action)
control: it can trigger a weapon to fire after once it reaches a specific temperature.
behavior: it is used to cause weapons to activate once a the fuze hits a specific temperature.
role: processing, it takes in an input and gives out an output
pattern: behavioral, communicates between two objects
concern: controller, updates the object it's connected to after receiving input
difficulty: easy, takes an input, the processes the input and provides an output
risk: moderate, if done wrong, weapons wouldn't work properly or even at all
presentation: a check box that is labeled and will be checked when activated

35. **thermal sensor**: a data collection device that collects data on temperature
source: [@www.cpinc.com/Trerice/Temperature/63%20-%2064%20temperature.pdf]
category: noun
data: data collector (Static, does not move)
control: it collects data of temperature and sends that data off to be processed
behavior: takes in data and sends data to be analyzed

role: input, collects data and sends it to process
pattern: behavioral, used to determine the behavior of what's it connected to.
concern: controller, because it manipulates how the model should behave
difficulty: easy, should just be a simple piece of data collection script
risk: low risk because it shouldn't be all that har to write
presentation: small circle with a label, displays details when clicked on

36. **timed fuze**: a trigger that activates after a set period
source: [@en.wikipedia.org/wiki/Fuze#Time_fuze]
category: noun
data: timer (dynamic, timer changes), trigger (dynamic, used to activate)
control: it can trigger a weapon to fire after a set period.
behavior: it is used to be able to delay the activation of a weapon after its been triggered.
role: processing, it takes in an input and gives out an output
pattern: behavioral, communicates between two objects
concern: controller, updates the object it's connected to after receiving input
difficulty: easy, takes an input, the processes the input and provides an output
risk: moderate, if down wrong, weapons wouldn't work properly or even at all
presentation: a check box that is labeled and will be checked when activated

37. **torpedo**: a self-propelled weapon with an explosive warhead
source: [@en.wikipedia.org/wiki/Torpedo]
category: noun
data: thruster (dynamic, used to move the whole object), warhead (dynamic, it explodes)
control: it can propel its self through water and explode either on contact with an object or in proximity to an object
behavior: used in war to damage enemy ships
role: output, it is a result of
pattern: behavioral, because this acts on an object
concern: controller, because it responds to input and acts on another object
difficulty: moderate, this must respond to one object and act on another object
risk: moderate risk, since it has to interact with other object giving opportunity for failure.
presentation: small red triangle with a T in the middle

38. **triangulation**: a process using geometry using triangles to locate an object
source: [@en.wikipedia.org/wiki/Triangulation]
category: noun
data: known objects (static, not moving), unknown object (dynamic, could be moving)
control: it can find location of points by forming triangle to it from known points
behavior: used to locate ships or objects of interest
role: processing because it is a process using data from the environment
pattern: behavioral because it's a process acting on data
concern: controller because it responds to the input given
difficulty: easy because it's just a simple math mathematical equation
risk: moderate, if someone were to mess up the equation it would not work
presentation: show the triangles crated from each object

39. **trilateration**: a process using geometry to locate objects
source: [@www.revolvy.com/page/Trilateration]
category: noun
data: known objects (static, not moving), unknown object (dynamic, could be moving)

control: it can find location of points by measurement of distances using geometry
behavior: used to locate ships
role: processing because it is a process using data from the environment
pattern: behavioral because it's a process acting on data
concern: controller because it responds to the input given
difficulty: easy because its just a simple math mathematical equation
risk: moderate, if someone where to mess up the equation it would not work
presentation: show the geometry being used from each object

Total Word Count: 4193

Part B

Vehicles

Battleship

bomber aircraft

destroyer

fighter aircraft

submarine

Weapons

Torpedo

Munition

Missile

main battery gun

depth charge

bomb

Sensors

active radar sensor

active sonar sensor

acoustic sensor

passive radar sensor

passive sonar sensor

sensor

sensor fusion

thermal sensor

Fuzes

timed fuze

thermal proximity fuze

radar proximity fuze

distance fuze

depth fuze

acoustic proximity fuze

Processes

acquisition process

engagement process

lethality process

mobility process

Maneuvers

Countermeasure

defensive maneuver

evasive maneuver

offensive maneuver

Calculations

Triangulation

Trilateration

Miscellanies

Actuator

Attenuation

Power

cross-section/reflectivity