Variables: snake_case
Functions: camelCase
Tasks: camelCaseTask
Task Handle: camelCaseTaskHandle
Semaphores: snake_case_semaphore
Queue: camelCaseQueue
Mutex: snake_case
Constants: static const type const_ant

Controller scheme:
1. Joystick: rotation (L/R)
2. A:
    a. Thrust (config A)
    b.
3. B:
    a. Cannon (config A)
    b. Thrust (config B)
    c. Thrust (config C)
4. C:
    a. Canon (config B)
5. D: free for the time being
6. E: pause
    a. Resume
    b. Quit
7. F: reset
8. K: Cannon (config C)

Menu (Start menu):
1. Single-Player
2. Multi-Player
3. High-Scores
    a. name/identifier - 4 capital letters
        i. Keyboard:
            1. Scrolling thru alphabet with keys/joystick
            2. Full keyboard?
        ii. Avatar?
            1. 15 possibilities
        iii. Combinations of A/B/C/D?
    b. 15 lines
4. Settings
    a. Button config
    b. Have cheats also under settings instead of different place?
5. Cheats
    a. Infinite lives
    b. Starting score
    c. Starting level

Scores: //PLACEHOLDERS, SEE GAMEPLAY
1. Small asteroid
   a. 100p
2. Medium asteroid
   a. 300p = 2 * small + 100
3. Large asteroid
   a. 700p = 2 * medium + 100
4. Flying saucer
   a. Spawns 2 times/level
   b. 1000p

Physics
1. Ship
   a. Think in angle/speed
   b. Accelerate: min_constant + constant * t
      i. Until max_constant
   c. Decelerate: max_constant - e^(-constant*t)
   d. Convert these: X and Y coordinates
   e.
   f.
2. Flying Saucer
   a. Spawn timer: 20s, 35s
   b. 2 lives
   c. Constant speed
   d. Trajectory
      i. Spawns on the left side, in one of the four spawn points
      ii. Linear, changing up/down (see drawing)
      iii. Changes 2 times per screen (after third of the screen has been passed)
   e. Always shoots your way, decide on bullet speed
3. Asteroids: 3 different shapes for each type
   a. Small (destroyed after 1 hits)
   b. Medium (destroyed after 3 hits)
   c. Large (destroyed after 7 hits)
4. New life every 5000 points
5. Next level when everything destroyed
6. Levels
   a. 1: 20 small asteroids + 2 saucers
   b. 2: 10 small +5 medium + 5 large + 2 saucers
   c. 3: 10 medium + 10 large asteroids + 2 saucers

Object types with properties
1. Asteroid
   a. Struct coordinates x, y
   b. Type (1-9) // 3S, 3M, 3L

2. Saucer
    a. Struct coordintates_saucer x, y
    b. Struct coordinates_ball x, y
3. Player
    a. struct coordinates x, y
    b. rotation_angle (from joystick)
    c. struct coordinates_laser x, y

Variables:
1. player_1
2. player_2
3. saucer_1
4. saucer_2
5. asteroid_1
6. asteroid_2
7. asteroid_3
8. asteroid_4
9. asteroid_5
10. asteroid_6
11. asteroid_7
12. asteroid_8
13. asteroid_9
14. asteroid_10
15. asteroid_11
16. asteroid_12

Rules for asteroids:
1. **L**: reserves 4 variables
    a. L: variable_1
    b. M: variable_1 and variable_3
    c. S: variable_1, variable_2, variable_3 and variable_4
2. **M**: reserves 2 variables
    a. M: variable_1
    b. S: variable_1 and variable_2
3. **S**: reserves 1 variable
    a. S: variable_1
4. Splitting //choose one of these
    a. 90 degree from current trajectory
    b. 90 degree from bullet trajectory

Coordinates (see drawing)
1. Absolute
    a. polar coordinates of Player -- convert from speed and angle
        i. $x = (v * t)*cos(speed * t + current\_angle)$
        ii. $y = (v * t)*sin(rotation\_angle)$
    b. Carthesian coordinates for all others
2. Screen

a. (Absolute - 40) for both x and y

3. **Default** values (at game start)
    a. for all objects except player: 0 , 0
    b. for player: screen center (probably abs 200, 160)

Animations:
1. Destructions
2. Shooting
3. Asteroid splitting

State machine //only those that we enable
1. StartMenu
    a. frameSwapper
    b. StateMachine
    c. drawTaskMenu
    d. checkButtons
2. Single
    a. frameSwapper
    b. StateMachine
    c. drawTaskSingle
    d. checkButtons
3. Multi
    a. frameSwapper
    b. StateMachinei
    c. drawTaskMulti
    d. checkButtons
    e. sendUART
    f. receiveUART
4. Pause
    a. frameSwapper
    b. StateMachine
    c. drawTaskPause
    d. checkButtons
5. Settings
    a. frameSwapper
    b. StateMachine
    c. drawTaskSettings
    d. checkButtons
6. High Score
    a. frameSwapper
    b. StateMachine
    c. drawHighScoreTask
    d. checkButtons
7. Cheats
    a. frameSwapper

        b. StateMachine

        c. drawTaskCheats

        d. checkButtons

Tasks
1. frameSwapperTask
2. stateMachineTask
3. changeStateTask
4. drawTaskSingle
5. drawTaskMulti
6. drawTaskStartMenu
7. drawSettingsTask
8. drawHighScoreTask
9. drawCheatsTask
10. drawPauseTask
11. checkButtonsTask
12. UARTsendTask
13. UARTreceiveTask

To'Do's
1. Physics
2. Buttons / State Machine
3. DrawTasks/Graphics
4. UART
5. Macro's (#define)