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classDiagram
    class ShadowDefend {
        - HEIGHT: int = 768
        - WIDTH: int = 1024
        - MAX_LEVELS_SUPPORTED: int = 2
        - FPS: int = 60
        - levelNumber: int = 1
        + main(args: String[]): void
        + update(input: Input): void
    }
    class Level {
        - WAVES_SRC: String = "res/levels/waves.txt"
        - LEVELS_PATH: String = "res/levels"
        - INDEX_OF_WAVE_NUM: int = 0
        - NEW_WAVE_KEY: Keys = Keys.S
        - SPEED_UP_KEY: Keys = Keys.L
        - SLOW_DOWN_KEY: Keys = Keys.K
        - SENSITIVITY_FOR_KEY: double = 0.5
        - INITIAL_NUM_LIVES: int = 25
        - INITIAL_MONEY: int = 500
        - WAVE_STATUS: String = "Wave in Progress"
        - PLACING_STATUS: String = "Placing"
        - WINNER_STATUS: String = "Winner"
        - WAITING_STATUS: String = "Awaiting Start"
        - frameCount: double = 0
        - timeOfLatestChanger: double = 0
        - timescale: int = 1
        - livesLeft: int = INITIAL_NUM_LIVES
        - moneyLeft: int = INITIAL_MONEY
        - map: TiledMap
        - wavesCompleted: int = 0
        - isActive: boolean = true
        - gamelsOver: boolean = false
        - isPlacing: boolean = false
        + Level(levelNumber: int)
        + adjustTimescale(adjustment: int, frameCount: double): void
        + update(input: Input): void
    }
    class Wave {
        - INDEX_OF_WAVE_TYPE: int = 1
        - SPAWN_EVENT_TYPE: String = "spawn"
        - DELAY_EVENT_TYPE: String = "delay"
        - MONEY_AWARDED: int = 150
        - LEVEL_NUM_BONUS: int = 100
        - polyline: ArrayList<Point>
        - isActive: boolean = false
        - eventsCommenced: int = 0
        - waveNumber: int
        + Wave(polyline: List<Point>, waveNumber: int)
        + addWaveEvent(waveEventInfo: String): void
        + update(timescale: int, frameCount: double): void
    }
    class WaveEvent {
        - INDEX_OF_WAVE_NUM: int = 0
        - MILLI_TO_NORMAL: double = 0.001
        - waveNumber: int
        - isActive: boolean = false
        - frameOfEventStart: double
        + WaveEvent(eventInfo: String[])
        + activate(frameCount: double): void
        + isStillRunning(): boolean
        + update(timescale: int, frameCount: double): void
    }
    class SpawnEvent {
        - INDEX_OF_NUM_SPAWN: int = 2
        - INDEX_OF_ENEMY_TYPE: int = 3
        - INDEX_OF_SPAWN_DELAY: int = 4
        - ONE_PIXEL: int = 1
        - REG_SLICER_NAME: String = "slicer"
        - SUPER_SLICER_NAME: String = "superslicer"
        - MEGA_SLICER_NAME: String = "megaslicer"
        - APEX_SLICER_NAME: String = "apexslicer"
        - numSpawned: int = 0
        - numDeactivated: int = 0
        - numToSpawn: int
        - spawnDelay: int
        - spawnDelay: int
        - frameOfLatestChange: double
        - stillRunning: boolean
        - polyline: ArrayList<Point>
        + SpawnEvent(eventInfo: String[], polyline: ArrayList<Point>)
        + activate(frameCount: double): void
        + isStillRunning(): boolean
        + update(timescale: int, frameCount: double): void
    }
    class Defender {
        - image: Image
        - rect: Rectangle
        - damage: double
        - price: int
        - position: Point
        - isDeployed: boolean = false
        + Defender(point: Point, image: Image)
        + purchase(): int
    }
    class Tower {
        - MILLI_TO_NORMAL: double = 0.001
        - radius: int
        - coolDownTime: int
        - framesSincePrevShot: double
        + Tower(point: Point, image: Image)
        + shoot(): void
    }
    class Tank {
        - TANK_PRICE: int = 250
        - TANK_SRC: String = "res/images/tank.png"
        - RADIUS: int = 100
        - COOLDOWN: int = 1000
        + Tank(point: Point)
    }
    class SuperTank {
        - STANK_PRICE: int = 600
        - STANK_SRC: String = "res/images/supertank.png"
        - RADIUS: int = 150
        - COOLDOWN: int = 500
        + SuperTank(point: Point)
    }
    class Airplane {
        - AIRPLANE_PRICE: int = 500
        - SPEED: int = 5
        - AIRPLANE_SRC: String = "res/images/airsupport.png"
        - isHorizontal: boolean
        - waitTime: int
        + Airplane(point: Point)
        + deploy(point: Point): void
        + drop(point: Point): void
    }
    class Projectile {
        - TANK_PROJ_SRC: String = "res/images/tank_projectile.png"
        - STANK_PROJ_SRC: String = "res/images/supertank_projectile.png"
        - TANK_DAMAGE: int = 1
        - STANK_DAMAGE: int = TANK_DAMAGE * 3
        - SPEED: int = 10
        - position: Point
        - direction: Vector2
        + Projectile(point: Point)
        + hasHit(): boolean
        + inflictDamage(): void
        + move(): void
    }
    class Ammunition {
        - damage: int
        - image: Image
        - rect: Rectangle
        + hasHit(): boolean
        + inflictDamage(): void
    }
    class BuyPanel {
        - MONEY_FONT_SIZE: int = 48
        - BINDS_FONT_SIZE: int = 14
        - PRICE_FONT_SIZE: int = 22
        - BUY_PANEL_IMG: Image = "res/images/buypanel.png"
        - BUY_PANEL_CENTRE: Point = Point(ShadowDefend.getWidth()/2, ShadowDefend.getHeight()/2)
        - KEY_BINDS: String = "Key binds:\nK - Start Wave\nL - Increase Timescale\nK - Decrease Timescale"
        - MONEY_TEXT_XVALUE: ShadowDefend.getWidth() - 200
        - MONEY_TEXT_YVALUE: 65
        - BINDS_TEXT_XVALUE: ShadowDefend.getWidth()/2 - 60
        - BINDS_TEXT_YVALUE: 20
        - DEFENDER_IMG_YVAL: BUY_PANEL_IMG.getHeight()/2 - 10
        - TANK_XVAL: 64
        - PXLS_BTW_IMGS: 120
        + update(moneyLeft: int): void
        + cursorOverDefender(cursorPos: Point): Defender
    }
    class StatusPanel {
        - STATUS_PANEL_IMG: Image = "res/images/statuspanel.png"
        - STATUS_PANEL_CENTRE: Point = Point(ShadowDefend.getWidth()/2, ShadowDefend.getHeight()/2)
        - STATUS_PANEL_IMG.getHeight()/2
        - STATUS_FONT_SIZE: int = 15
        - WAVE_NUM_TEXT_XVALUE: int = 10
        - TSCALE_TEXT_XVALUE: int = 10
        - STATUS_TEXT_XVALUE: int = 10
        - LIVES_TEXT_XVALUE: int = 10
        - ALL_TEXT_YVALUE: int = ShadowDefend.getHeight()/2 + 5
        - STATUS_PANEL_IMG.getHeight()/2 + 5
        + update(waveNumber: int, status: String, timescale: int, livesLeft: int): void
    }
    class Enemy {
        - image: Image
        - rect: Rectangle
        - isActive: boolean
        - polyline: List<Point>
        - currentPoint: Point
        - nextPoint: Point
        - nextPointIndex: int
        - angle: double
        - healthRemaining: double
        + Enemy(point: Point, imageSrc: String)
        + move(dx: Vector2): void
        + findCentre(): Point
        + activate(): void
        + changeMovement(): void
        + die(): int
    }
    class RegularSlicer {
        - REG_SLICER_SRC: String = "res/images/slicer.png"
        - INITIAL_HEALTH: double = 1
        - REWARD: int = 2
        - PENALTY: int = 1
        - SPEED: double = 2
        + die(): int
    }
    class MegaSlicer {
        - MEGA_SLICER_SRC: String = "res/images/megaslicer.png"
        - NUM_CHILDREN: int = 2
        - INITIAL_HEALTH: double = 2 * RegularSlicer.getInitialHealth()
        - REWARD: int = 150
        - PENALTY: int = NUM_CHILDREN * MegaSlicer.getPenalty()
        - SPEED: double = 0.5 * MegaSlicer.getSpeed()
        + die(): int
    }
    class SuperSlicer {
        - SUPER_SLICER_SRC: String = "res/images/superslicer.png"
        - NUM_CHILDREN: int = 2
        - INITIAL_HEALTH: double = RegularSlicer.getInitialHealth()
        - REWARD: int = 15
        - PENALTY: int = NUM_CHILDREN * RegularSlicer.getPenalty()
        - SPEED: double = 0.75 * RegularSlicer.getSpeed()
        + die(): int
    }
    class ApexSlicer {
        - APEX_SLICER_SRC: String = "res/images/apexslicer.png"
        - NUM_CHILDREN: int = 4
        - INITIAL_HEALTH: double = 25 * RegularSlicer.getInitialHealth()
        - REWARD: int = 150
        - PENALTY: int = NUM_CHILDREN * MegaSlicer.getPenalty()
        - SPEED: double = 0.5 * MegaSlicer.getSpeed()
        + die(): int
    }
    ShadowDefend "1" -- "0..*" Level
    Level "1" -- "0..*" Wave
    Wave "1..*" -- "1" WaveEvent
    WaveEvent "1" -- "1" DelayEvent
    DelayEvent "1" -- "1" Enemy
    Enemy "1..*" -- "1" RegularSlicer
    RegularSlicer "1" -- "0..*" MegaSlicer
    MegaSlicer "1" -- "0..*" SuperSlicer
    SuperSlicer "1" -- "0..*" ApexSlicer
    Level "1" -- "0..*" Defender
    Level "1" -- "0..*" Tower
    Level "1" -- "0..*" Tank
    Level "1" -- "0..*" SuperTank
    Level "1" -- "0..*" Airplane
    Level "1" -- "0..*" Projectile
    Level "1" -- "0..*" Ammunition
    Level "1" -- "0..*" BuyPanel
    Level "1" -- "0..*" StatusPanel
    Level "1" -- "0..*" Enemy
    Level "1" -- "0..*" RegularSlicer
    Level "1" -- "0..*" MegaSlicer
    Level "1" -- "0..*" SuperSlicer
    Level "1" -- "0..*" ApexSlicer
    Wave "1..*" -- "0..*" Enemy
    Wave "1..*" -- "0..*" RegularSlicer
    Wave "1..*" -- "0..*" MegaSlicer
    Wave "1..*" -- "0..*" SuperSlicer
    Wave "1..*" -- "0..*" ApexSlicer
    WaveEvent "1..*" -- "0..*" Enemy
    WaveEvent "1..*" -- "0..*" RegularSlicer
    WaveEvent "1..*" -- "0..*" MegaSlicer
    WaveEvent "1..*" -- "0..*" SuperSlicer
    WaveEvent "1..*" -- "0..*" ApexSlicer
    DelayEvent "1..*" -- "0..*" Enemy
    DelayEvent "1..*" -- "0..*" RegularSlicer
    DelayEvent "1..*" -- "0..*" MegaSlicer
    DelayEvent "1..*" -- "0..*" SuperSlicer
    DelayEvent "1..*" -- "0..*" ApexSlicer
    Enemy "1..*" -- "0..*" RegularSlicer
    Enemy "1..*" -- "0..*" MegaSlicer
    Enemy "1..*" -- "0..*" SuperSlicer
    Enemy "1..*" -- "0..*" ApexSlicer
    RegularSlicer "1..*" -- "0..*" MegaSlicer
    RegularSlicer "1..*" -- "0..*" SuperSlicer
    RegularSlicer "1..*" -- "0..*" ApexSlicer
    MegaSlicer "1..*" -- "0..*" SuperSlicer
    MegaSlicer "1..*" -- "0..*" ApexSlicer
    SuperSlicer "1..*" -- "0..*" ApexSlicer
    Defender "1..*" -- "0..*" Tower
    Defender "1..*" -- "0..*" Tank
    Defender "1..*" -- "0..*" SuperTank
    Defender "1..*" -- "0..*" Airplane
    Defender "1..*" -- "0..*" Projectile
    Defender "1..*" -- "0..*" Ammunition
    Defender "1..*" -- "0..*" BuyPanel
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    Defender "1..*" -- "0..*" Enemy
    Defender "1..*" -- "0..*" RegularSlicer
    Defender "1..*" -- "0..*" MegaSlicer
    Defender "1..*" -- "0..*" SuperSlicer
    Defender "1..*" -- "0..*" ApexSlicer
    Tower "1..*" -- "0..*" Tank
    Tower "1..*" -- "0..*" SuperTank
    Tower "1..*" -- "0..*" Airplane
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    Airplane "1..*" -- "0..*" SuperSlicer
    Airplane "1..*" -- "0..*" ApexSlicer
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    Projectile "1..*" -- "0..*" StatusPanel
    Projectile "1..*" -- "0..*" Enemy
    Projectile "1..*" -- "0..*" RegularSlicer
    Projectile "1..*" -- "0..*" MegaSlicer
    Projectile "1..*" -- "
```

