<<interface>>
Drawable

---

void drawObj()
ImageStorage getImg()

<<interface>>
Collideable

---

boolean isColliding(Collideable other)
void collide(Collideable other)
void collide()
int getX(); int getY()
int getWidth(); int getHeight()

<<class>>
Tile

TileType _type
int _xPos, _yPos, _value, dim
Tower _tower
int _value
ImageStorage img

Tile()
Tile(int x, int y, int value,
        ImageStorage nimg)
boolean towerPlaceable()
int getValue()
int setValue()
void setType(TileType t)
void addTower(Tower tower)
Drawable getTower()
boolean towerPlaceable
TileType getType()

<<class>>
Button

PImage _btnImg
ImageStorage img
ButtonType _type
Tower targetTower
float x,y

Button(float nx,float ny,ButtonType type,
   Tower target, ImageStorage nimg)
void setType(ButtonType t)
void setTarget(Tower t)
void setX(float nx)
void setY(float ny)
void action()
Tower getTarget()
boolean hovering()

<<class>>
Projectile

---

float damage, _xPos, _yPos, _speed, _angle
double _dx, _dy
int _rad
ImageStorage img

Projectile(float x, float y, double _speed,
   float dmg, float _angle, ImageStorage nimg)
boolean outOfBounds()

<<class>>
Tower

---

float _range, _xPos, _yPos, _reloadTime
int _width, _height
Queue<Enemy> _enemies
float _angle, _atk
double _speed
boolean showRange
ImageStorage img
int atkUpgradeCost, rangeUpgradeCost,
    reloadUpgradeCost, speedUpgradeCost
int dim
boolean active

Tower(int xPos, int yPos,
        ImageStorage nimg)
void cheque()
void detect()
void shoot()
void aim()
void increaseAttack()
void increaseRange()
void increaseReload()
void increaseSpeed()
int getAtkCost()
int getRangeCost()
int getReloadCost()
int getSpeedCost()
void setShowRange(boolean s)

<<class>>
Map

Tile[][] _map
int _width, _height
ImageStorage img
Tile _start, _end

Map(ImageStorage img)
void mapOne()
int idealSquare()
void placePath(int x, int y)
void placePath(int x, int y, int value)
void placeGrass(int x, int y)
void placeTower(int x, int y)
Tile getTile(int x, int y)
Tile getLeft(Tile t)
Tile getRight(Tile t)
Tile getUp(Tile t)
Tile getDown(Tile t)
Tile getStart()
Tile getEnd()

<<class>>
Enemy

---

int _hp, _rad
float _xPos, _yPos, _d, _dx, _dy
Map _map
Tile _target
ImageStorage img

Enemy(Map theMap, ImageStorage nimg)
boolean isAlive()
void setMovement()
void move()
String toString()
String printInfo() //debug method

Game
<<class>>
Game
(Main Class)

```
Map _map
ImageStorage _img
List<Enemy> _enemies
List<Projectile> _projectiles
List<Tower> _towers
QuadTree _qTree
Deque<Enemy> _enemyQueue
GameState status
int lives, money, kills
boolean running, showUpgrades, confirmTower
PImage menu, loss, win
Button playBtn, atkBtn, reloadBtn, rangeBtn, speedBtn,
        confirmBtn, cancelBtn
int tutorialSlide
```

```
void setup()
void draw()
void render()
void spawn()
void popQuadTree()
void tutorial()
void mouseClicked()
void keyPressed()
void titleScreen()
void endScreen()
void winScreen()
```

<<class>>
QuadTree

```
int _maxObjects
int _maxLevels
int _level
List _objects
Rectangle _bounds
QuadTree[] _nodes
QuadTree _parent
```

```
QuadTree( int level,
        Rectangle bounds )
---------------------
void clear()
void split()
int getIndex()
void insert( Collideable obj )
List retrieve( List retList,
            Collideable obj )
void insertCollideables( List objects )
// Iterate through objects. If an object
   is a Collideable, insert it into to the
   quadTree
```

<<class>>
ImageStorage

```
PImage grass
PImage tower
PImage path
PImage turret
PImage play
PImage fast
PImage slow
PImage attack
PImage reload
PImage range
PImage speed
PImage ok
PImage cancel
```

```
PImage grass()
PImage tower()
PImage path()
PImage turret()
PImage play()
PImage fast()
PImage slow()
PImage attack()
PImage reload()
PImage range()
PImage speed()
PImage ok()
PImage cancel()
```

<<enum>>
TileType

```
GRASS
PATH
```

<<enum>>
GameState

```
TITLE
TUTORIAL
WAITING
GAMEPLAY
END
WIN
```

<<enum>>
ButtonType

```
PLAY
FASTFORWARD_ON
FASTFOWRRD_OFF
ATTACK
RANGE
RELOAD
SPEED
OK
CANCEL
```

<<templateUML>>
TemplateUml

```
Integer example
```

```
String toString()
```

Team PotatoPower
Arif Roktim, Alitquan Mallick, Shakil Rafi
APCS2 pd4
HW48 -- On Target
2017-06-07