NanoBoy Library Reference Manual

This manual summarizes all available functions of the **NanoBoy** library developed by **Mikrotronics Pakistan** (https://mikro.pk). The library is designed to help students and hobbyists learn embedded programming and game development using the NanoBoy gaming console. All examples are free to distribute as long as this notice is preserved.

Initialization

```
nb.begin();  // Call in setup()
```

Display Control

```
nb.clear();
nb.display();
```

Drawing Primitives

```
nb.drawPixel(x, y);
nb.drawLine(x0, y0, x1, y1);
nb.drawRect(x, y, w, h);
nb.fillRect(x, y, w, h);
nb.drawCircle(x, y, r);
nb.fillCircle(x, y, r);
```

Text Functions

```
nb.setCursor(x, y);
nb.print("Hello");
nb.drawText(x, y, "Hello");
```

Sprites

```
struct Sprite {
  int x, y;
  int w, h;
  const uint8_t* bitmap;
  bool active;
};

Sprite player = {16, 16, 8, 8, playerBitmap, true};
nb.drawSprite(player);
```

Tile Maps

```
nb.drawTileMap(tileMap, rows, cols, tiles);
```

Collision Detection

```
if (nb.checkCollision(sprite1, sprite2)) { ... }
```

Input

```
if (nb.buttonPressed(BTN_A)) { ... }
if (nb.buttonReleased(BTN_B)) { ... }
```

LED & Sound

```
nb.setLED(true);
nb.beep(1000, 200);  // 1kHz tone for 200 ms
```

Pin Definitions

```
BTN_UP=2, BTN_DOWN=3, BTN_LEFT=4, BTN_RIGHT=5
BTN_A=6, BTN_B=7, LED=8, BUZZER=9
```

Example Game 1: Pong (Simplified)

```
#include <NanoBoy.h>
NanoBoy nb;

int ballX=64, ballY=32, dx=1, dy=1;
int paddleX=60;

void setup() { nb.begin(); }

void loop() {
  nb.clear();
  nb.fillRect(paddleX, 60, 20, 2);      // Paddle
  nb.fillRect(ballX, ballY, 3, 3);      // Ball

  // Move ball
  ballX += dx; ballY += dy;

  // Bounce
  if (ballX <= 0 || ballX >= 125) dx = -dx;
  if (ballY <= 0) dy = -dy;
  if (ballY >= 57 && ballX >= paddleX && ballX <= paddleX+20) dy = -dy;

  // Paddle control
  if (nb.buttonPressed(BTN_LEFT)) paddleX -= 2;
  if (nb.buttonPressed(BTN_RIGHT)) paddleX += 2;

  nb.display();
}
```

Example Game 2: Snake (Simplified)

```
#include <NanoBoy.h>
NanoBoy nb;

#define MAX_LEN 50
int snakeX[MAX_LEN], snakeY[MAX_LEN], length=5, dir=1;
int foodX=10, foodY=10;

void setup() {
  nb.begin();
  for (int i=0; i<length; i++){ snakeX[i]=20-i; snakeY[i]=20; }
}

void loop() {
  nb.clear();

  // Move snake
  for (int i=length-1; i>0; i--){ snakeX[i]=snakeX[i-1]; snakeY[i]=snakeY[i-1]; }
  if (dir==0) snakeY[0]--; if (dir==1) snakeX[0]++;
  if (dir==2) snakeY[0]++; if (dir==3) snakeX[0]--;

  // Input
  if (nb.buttonPressed(BTN_UP)) dir=0;
  if (nb.buttonPressed(BTN_RIGHT)) dir=1;
  if (nb.buttonPressed(BTN_DOWN)) dir=2;
  if (nb.buttonPressed(BTN_LEFT)) dir=3;

  // Draw snake
  for (int i=0; i<length; i++) nb.fillRect(snakeX[i]*2, snakeY[i]*2, 2, 2);

  // Food
  nb.fillRect(foodX*2, foodY*2, 2, 2);
```

```
  nb.display();
  delay(100);
}
```