# STM32 RTOS ???? - ???? RTOS ??? STM32CubeMX ??

## ? ????

- □□ RTOS □□□□
- □□ STM32CubeMX □□ FreeRTOS
- □□□□□□□□□□□□ RTOS □□□ Blink Task□

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## ? RTOS ????

RTOS□ Real-Time Operating System
□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□ FreeRTOS □ STM32
□□□□□□ RTOS□

RTOS □□□

- □□ (Task) □□□
- □□□□□□□
- □□□□□□□□□□ Semaphore□ Queue □□
- □□□□□□□

---

## ? STM32CubeMX ?? FreeRTOS

### Step 1??????

- □□ STM32CubeMX
- □□□□□□□□ STM32F103C8Tx□

### Step 2??? RTOS

- □□□□□□ `Middleware > FREERTOS`

- Enable FreeRTOS
- Task Configuration → □□□□□ `defaultTask` □□□□□ `StartDefaultTask`
- □□ stack size: `128`□ priority: `Normal`

# Step 3??? System Clock

- □□ HSE □ HSI □□□□□□□□□□□□□□ 72MHz□

# Step 4??????

- □□ `Project Manager > Project`□□□□□□
- Toolchain: □□□□ IDE□□ STM32CubeIDE□
- Generate Code □

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# ? ????? - Blink LED

□ `StartDefaultTask` □□□□□ LED □□□□

```
void StartDefaultTask(void *argument)
{
  for(;;)
  {
    HAL_GPIO_TogglePin(GPIOC, GPIO_PIN_13);
    osDelay(500);
  }
}
```

□□□ GPIO □□ CubeMX □□□ `Output`□□ `HAL_GPIO_TogglePin()` □□

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# ? ??????

- □□□□□
- □□ LED □ 0.5 □□□□
- □ HardFault□□□□

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# ? ?????

**□ 2 □□□□□□** **Task □□□□□□□□□□□□□□** **LED □□□**

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