**ĐẠI HỌC BÁCH KHOA HÀ NỘI**

**TRƯỜNG ĐIỆN – ĐIỆN TỬ**

----------

A picture containing logo

Description automatically generated

**BÁO CÁO BÀI TẬP LỚN**

***Đề tài****: Lập trình VĐK STM32 giao tiếp với cảm biến DHT11, SRF05 để hiện thị thông số đo được lên LCD 1602 và truyền thông số lên máy tính*

|  |  |  |
| --- | --- | --- |
| Môn học | Thiết kế hệ thống nhúng | |
| Giảng viên hướng dẫn | ThS. Lê Công Cường | |
| Nhóm thực hiện | Nhóm 2 |  |
|  | Phạm Thanh Tùng | 20192160 |
|  | Nguyễn Đình Dương  Lê Đình Khánh  Nguyễn Quang Minh  *Hà Nội, 03/2023* | 20191792  20191905  20191964 |

Mục lục

[MỞ ĐẦU 2](#_Toc129383977)

[Chương 1: Xác định yêu cầu 5](#_Toc129383978)

[1.1. Phân tích yêu cầu 5](#_Toc129383979)

[Chương 2: Giới thiệu phần cứng 6](#_Toc129383980)

[2.1. Nguyên lí các module phần cứng 6](#_Toc129383981)

[2.1.1. Vi điều khiển STM32F103C8T6 6](#_Toc129383982)

[2.1.2. LCD 1602 8](#_Toc129383983)

[2.1.3. DHT11 10](#_Toc129383984)

[2.1.4. Module cảm biến siêu âm HC-SR05 13](#_Toc129383985)

[2.1.5. Module USB to TTL CH340 15](#_Toc129383986)

[2.2. Ngoại vi của STM32 cần sử dụng 16](#_Toc129383987)

[*2.2.1.* Truyền thông nối tiếp UART 16](#_Toc129383988)

[*2.2.2. GPIO và ngắt ngoài* 17](#_Toc129383989)

[2.3. Sơ đồ kết nối STM32 và các module phần cứng. 21](#_Toc129383990)

[2.3.1. sơ đồ nguyên lý 21](#_Toc129383991)

[2.3.2. Sơ đồ ghép nối 22](#_Toc129383992)

[2.4. Lưu đồ thuật toán giao tiếp giữa STM32 và module phần cứng 22](#_Toc129383993)

[2.4.1. Giao tiếp giữa STM32 và DHT11 23](#_Toc129383994)

[2.4.2. Giao tiếp giữa STM32 với HC-RS04 24](#_Toc129383995)

[2.4.3. Giao tiếp giữa STM32 với LCD 25](#_Toc129383996)

[Chương 3. Thiết kế phần mềm 26](#_Toc129383997)

[3.1. phân tích và xử lý yêu cầu 26](#_Toc129383998)

[3.2. Thiết kế chương trình đơn nhiệm 27](#_Toc129383999)

[3.3. thiết kế chương trình đa nhiệm 28](#_Toc129384000)

[Chương 4: kết quả thực nghiệm và đánh giá 32](#_Toc129384001)

[4.1. kết quả đạt được 32](#_Toc129384002)

[4.2. đánh giá kết quả 33](#_Toc129384003)

[4.3. đánh giá công việc của từng thành viên trong nhóm 34](#_Toc129384004)

[Chương 5: Link share thư mục lập trình 35](#_Toc129384005)

# MỞ ĐẦU

Thiết bị phục vụ yêu cầu cuối kỳ của môn Thiết kế Hệ thống Nhúng, kỳ 20221. Mục tiêu của môn học là lập trình thời gian thực, lập trình ứng dụng FreeRTOS, kiểm tra và sửa lỗi.

Báo cáo của nhóm gồm 5 chương:

Chương 1: Xác định yêu cầu

Chương 2: Giới thiệu phần cứng

Chương 3: Thiết kế phần mềm

Chương 4: Kết quả thực nghiệm và đánh giá

Chương 5: Link share thư mục lập trình

Trước hết nhóm em xin gửi lời cảm ơn tới thầy Lê Công Cường đã hướng dẫn chỉ dạy để chúng em hoàn thành bản báo cáo môn học này. Vì hiểu biết còn hạn hẹp và thời gian hạn chế nhóm em còn nhiều thiếu sót, nhóm mong nhận được những sự góp ý, sửa đổi từ phía thầy để báo cáo của nhóm em được hoàn thiện hơn.

Bọn em xin chân thành cảm ơn thầy!

Danh mục hình ảnh:

[Figure 1: STM32c8t6 7](#_Toc129383122)

[Figure 2 Các thành phần chức năng của STM32F103C8T6. 8](#_Toc129383123)

[Figure 3: LCD1602 10](#_Toc129383124)

[Figure 4: kết nối giữa DHT11 với vi điều khiển 11](#_Toc129383125)

[Figure 5: module cảm biến siêu âm HC-SR04 14](#_Toc129383126)

[Figure 6: nguyên lý hoạt động của cảm biến HC-SR04 15](#_Toc129383127)

[Figure 7: module USB to TTL CH340 16](#_Toc129383128)

[Figure 8: sơ đồ nối dây giao thức UART 17](#_Toc129383129)

[Figure 9: định dạng gói tin của giao thức UART 18](#_Toc129383130)

[Figure 10: cấu trúc bên trong các chân GPIO của STM32 19](#_Toc129383131)

[Figure 11: cấu trúc tín hiệu của các chân ngắt ngoài 21](#_Toc129383132)

[Figure 12: sơ đồ nguyên lý của dự án 22](#_Toc129383133)

[Figure 13: sơ đồ ghép nối các module phần cứng 23](#_Toc129383134)

[Figure 14: Giao tiếp giữa STM32 với các module phần cứng 23](#_Toc129383135)

[Figure 15: lưu đồ thuật toán giao tiếp giữa STM32 với DHT11 24](#_Toc129383136)

[Figure 16: lưu đồ thuật toán giao tiếp giữa STM32 với HC-SR04 25](#_Toc129383137)

[Figure 17: lưu đồ thuật toán giao tiếp giữa STM32 với LCD1602 26](#_Toc129383138)

[Figure 18: lập lịch cho các task ở chế độ đa nhiệm 28](#_Toc129383139)

[Figure 19: lưu đồ thuật toán chương trình ở chế độ đa nhiệm 31](#_Toc129383140)

[Figure 20: kết quả chạy ở chế độ debug 32](#_Toc129383141)

[Figure 21: kết quả truyền lên phần mềm hercules trên máy tính 32](#_Toc129383142)

[Figure 22: hình ảnh mạch thực tế 33](#_Toc129383143)

# Chương 1: Xác định yêu cầu

* 1. Phân tích yêu cầu

Bảng 1: yêu cầu dự án

|  |  |  |
| --- | --- | --- |
| Stt | Yêu cầu | Ghi chú |
| 1 | Lập trình VĐK STM32 giao tiếp với cảm biến DHT11, SRF05 để hiện thị thông số đo được lên LCD 1602, và truyền thông số lên máy tính theo 2 chế độ:  1) Theo chu kỳ, với chu kỳ cài đặt được từ máy tính và phím bấm  2) Theo yêu cầu từ máy tính với từng thông số  Lựa chọn chế độ và đặt ngưỡng cảnh báo cho từng thông số từ máy tính. |  |
| 2 | Lập trình đơn nhiệm |  |
| 3 | Lập trình đa nhiệm |  |

1.2. Tổng quan chương trình:

- Đọc dữ liệu nhiệt độ, độ ẩm từ cảm biến DHT và khoảng cách từ HCSR04 hiển thị LCD, truyền nhận Uart lên máy tính theo chu kì, có Led báo ngưỡng khi dữ liệu đo được vượt quá ngưỡng cho phép.

- Cập nhật command, ngưỡng , chu kì của từng dữ liệu qua Uart.

- Có nút nhấn để cập nhật chu kì: nhấn 1 lần gửi Uart với chu kì 1s; nhấn 2 lần gửi Uart với chu kì 2s; nhấn 3 lần gửi Uart với chu kì 3s.

# Chương 2: Giới thiệu phần cứng

## 2.1. Nguyên lí các module phần cứng

### 2.1.1. Vi điều khiển STM32F103C8T6

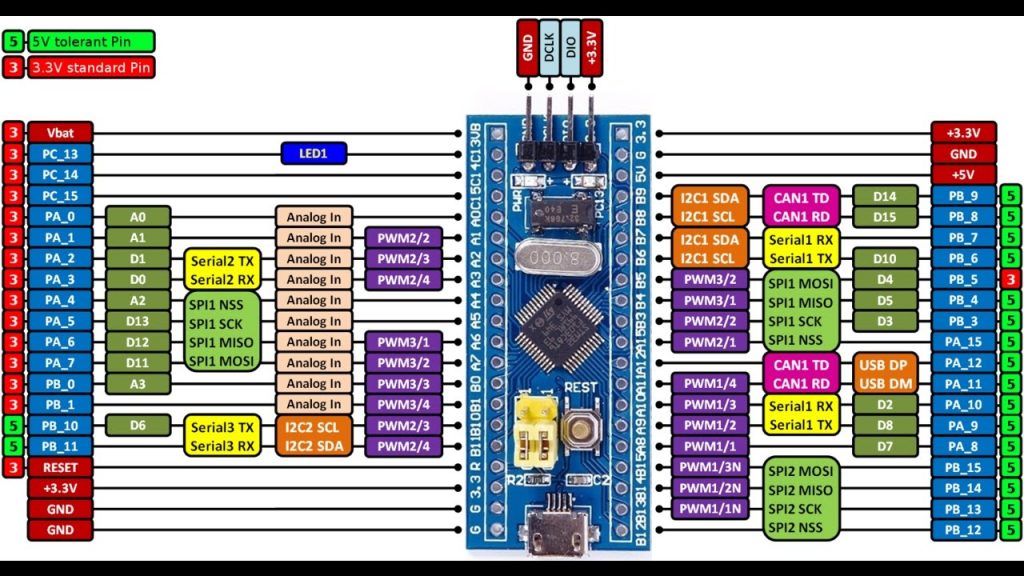


Figure : STM32c8t6

STM32F103 là vi điều khiển 32-bit có lõi vi xử lý là Arm 32-bit CortexM3 với tần số xung nhịp tối đa là 72MHz. Tốc độ thực hiện lệnh là 1.25 DMIPS/ MHz.

Một số ứng dụng chính: dùng cho driver để điều khiển ứng dụng, điều khiển ứng dụng thông thường, thiết bị cầm tay và thuốc, máy tính và thiết bị ngoại vi chơi game, GPS cơ bản, các ứng dụng trong công nghiệp, thiết bị lập trình PLC, biến tần, máy in, máy quét, hệ thống cảnh báo, thiết bị liên lạc nội bộ…

Phần mềm lập trình: có khá nhiều trình biên dịch cho STM32 như IAR Embedded Workbench, Keil C… Nhóm em sử dụng STM32CubeMX và Keil C để cấu hình và lập trình cho STM32F103.

Mạch nạp: có khá nhiều loại mạch nạp như: ULINK, J-LINK, CMSISDAP, STLINK… ở đây nhóm em sử dụng Stlink vì giá thành khá rẻ và debug lỗi cũng tốt.

Diagram, schematic

Description automatically generated

Figure Các thành phần chức năng của STM32F103C8T6.

Đặc điểm của vi điều khiển STM32F103C8T6:

* ARM 32-bit Cortex M3 với clock max là 72Mhz.
* Bộ nhớ:
  + 64 kbytes bộ nhớ Flash (bộ nhớ lập trình).
  + 20 kbytes SRAM.
* Clock, reset và quản lý nguồn.
  + Điện áp hoạt động 2.0V -> 3.6V.
  + Power on reset (POR), Power down reset (PDR) và programmable voltage detector (PVD).
  + Sử dụng thạch anh ngoài từ 4Mhz → 20Mhz.
  + Thạch anh nội dùng dao động RC ở mode 8Mhz hoặc 40khz.
  + Sử dụng thạch anh ngoài 32.768khz được sử dụng cho RTC.
* Trong trường hợp điện áp thấp:
  + Có các mode: ngủ, ngừng hoạt động hoặc hoạt động ở chế độ chờ.
  + Cấp nguồn ở chân Vbat bằng pin để hoạt động bộ RTC và sử dụng lưu trữ data khi mất nguồn cấp chính.
* ADC 12-bit với 12 kênh
  + Khoảng giá trị chuyển đổi từ 0 – 3.6V.
  + Lấy mẫu nhiều kênh hoặc 1 kênh.
  + Có cảm biến nhiệt độ nội.
* DMA: bộ chuyển đổi này giúp tăng tốc độ xử lý do không có sự can thiệp quá sâu của CPU.
  + 7 kênh DMA.
  + Hỗ trợ DMA cho ADC, I2C, SPI, UART.
* 7 timers:
  + 3 timer 16-bit hỗ trợ các mode IC/OC/PWM.
  + 1 timer 16-bit hỗ trợ để điều khiển động cơ với các mode bảo vệ như ngắt input, dead-time…
  + 2 watdog timer dùng để bảo vệ và kiểm tra lỗi.
  + 1 sysTick timer 24-bit đếm xuống dùng cho các ứng dụng như hàm Delay….
* Hỗ trợ 9 kênh giao tiếp bao gồm:
  + 2 bộ I2C(SMBus/PMBus).
  + 3 bộ USART (ISO 7816 interface, LIN, IrDA capability, modem control).
  + 2 SPIs (18 Mbit/s).
  + 1 bộ CAN interface (2.0B Active)
  + USB 2.0 full-speed interface.
* Kiểm tra lỗi CRC và 96-bit ID.
  + 1. LCD 1602

A, Thông số kĩ thuật:

* Điện áp hoạt động là 5 V.
* Kích thước: 80 x 36 x 12.5 mm
* Chữ đen, nền xanh lá
* Khoảng cách giữa hai chân kết nối là 0.1 inch tiện dụng khi kết nối với Breadboard.
* Tên các chân được ghi ở mặt sau của màn hình LCD hổ trợ việc kết nối, đi dây điện.
* Có đèn led nền, có thể dùng biến trở hoặc PWM điều chình độ sáng để sử dụng ít điện năng hơn.
* Có thể được điều khiển với 6 dây tín hiệu

B, Sơ đồ chân:

* VSS: tương đương với GND – cực âm
* VDD: tương đương với VCC – cực dương (5V)
* Constrast Voltage (Vo): điều khiển độ sáng màn hình
* Register Select (RS): điều khiển địa chỉ nào sẽ được ghi dữ liệu
* Read/Write (RW): Bạn sẽ đọc (read mode) hay ghi (write mode) dữ liệu? Nó sẽ phụ thuộc vào bạn gửi giá trị gì vào.
* Enable pin: Cho phép ghi vào LCD
* D0 – D7: 8 chân dư liệu, mỗi chân sẽ có giá trị HIGH hoặc LOW nếu bạn đang ở chế độ đọc (read mode) và nó sẽ nhận giá trị HIGH hoặc LOW nếu đang ở chế độ ghi (write mode)
* Backlight (Backlight Anode (+) và Backlight Cathode (-)): Tắt bật đèn màn hình LCD.

Graphical user interface, application

Description automatically generated

Figure : LCD1602

* + 1. DHT11

A, Thông số kỹ thuật:

* Nguồn: 3 -> 5 VDC.
* Dòng sử dụng: 2.5mA max (khi truyền dữ liệu).
* Đo tốt ở độ ẩm 0 to 100%RH với sai số ±2%.
* Đo tốt ở nhiệt độ -40 to 80°C sai số ±0.5°C.
* Tần số lấy mẫu tối đa 0.5Hz (2 giây 1 lần)
* Kích thước 27mm x 59mm x 13.5mm (1.05" x 2.32" x 0.53")

1. Nguyên lý hoạt động

* Sơ đồ kết nối vi xử lý :

![Diagram, schematic

Description automatically generated](data:image/jpeg;base64,/9j/4AAQSkZJRgABAQEAeAB4AAD/4RDcRXhpZgAATU0AKgAAAAgABAE7AAIAAAAGAAAISodpAAQAAAABAAAIUJydAAEAAAAMAAAQyOocAAcAAAgMAAAAPgAAAAAc6gAAAAgAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAGFkbWluAAAFkAMAAgAAABQAABCekAQAAgAAABQAABCykpEAAgAAAAMzMwAAkpIAAgAAAAMzMwAA6hwABwAACAwAAAiSAAAAABzqAAAACAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAMjAyMjowMTowOCAxMDoxNDoyMAAyMDIyOjAxOjA4IDEwOjE0OjIwAAAAYQBkAG0AaQBuAAAA/+ELGGh0dHA6Ly9ucy5hZG9iZS5jb20veGFwLzEuMC8APD94cGFja2V0IGJlZ2luPSfvu78nIGlkPSdXNU0wTXBDZWhpSHpyZVN6TlRjemtjOWQnPz4NCjx4OnhtcG1ldGEgeG1sbnM6eD0iYWRvYmU6bnM6bWV0YS8iPjxyZGY6UkRGIHhtbG5zOnJkZj0iaHR0cDovL3d3dy53My5vcmcvMTk5OS8wMi8yMi1yZGYtc3ludGF4LW5zIyI+PHJkZjpEZXNjcmlwdGlvbiByZGY6YWJvdXQ9InV1aWQ6ZmFmNWJkZDUtYmEzZC0xMWRhLWFkMzEtZDMzZDc1MTgyZjFiIiB4bWxuczpkYz0iaHR0cDovL3B1cmwub3JnL2RjL2VsZW1lbnRzLzEuMS8iLz48cmRmOkRlc2NyaXB0aW9uIHJkZjphYm91dD0idXVpZDpmYWY1YmRkNS1iYTNkLTExZGEtYWQzMS1kMzNkNzUxODJmMWIiIHhtbG5zOnhtcD0iaHR0cDovL25zLmFkb2JlLmNvbS94YXAvMS4wLyI+PHhtcDpDcmVhdGVEYXRlPjIwMjItMDEtMDhUMTA6MTQ6MjAuMzI4PC94bXA6Q3JlYXRlRGF0ZT48L3JkZjpEZXNjcmlwdGlvbj48cmRmOkRlc2NyaXB0aW9uIHJkZjphYm91dD0idXVpZDpmYWY1YmRkNS1iYTNkLTExZGEtYWQzMS1kMzNkNzUxODJmMWIiIHhtbG5zOmRjPSJodHRwOi8vcHVybC5vcmcvZGMvZWxlbWVudHMvMS4xLyI+PGRjOmNyZWF0b3I+PHJkZjpTZXEgeG1sbnM6cmRmPSJodHRwOi8vd3d3LnczLm9yZy8xOTk5LzAyLzIyLXJkZi1zeW50YXgtbnMjIj48cmRmOmxpPmFkbWluPC9yZGY6bGk+PC9yZGY6U2VxPg0KCQkJPC9kYzpjcmVhdG9yPjwvcmRmOkRlc2NyaXB0aW9uPjwvcmRmOlJERj48L3g6eG1wbWV0YT4NCiAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAKICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgIAogICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgCiAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAKICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgIAogICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgCiAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAKICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgIAogICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgCiAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAKICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgIAogICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgCiAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAKICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgIAogICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgCiAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAKICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgIAogICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgCiAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAKICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgIAogICAgICAgICAgICAgICAgICAgICAgICAgICAgPD94cGFja2V0IGVuZD0ndyc/Pv/bAEMABwUFBgUEBwYFBggHBwgKEQsKCQkKFQ8QDBEYFRoZGBUYFxseJyEbHSUdFxgiLiIlKCkrLCsaIC8zLyoyJyorKv/bAEMBBwgICgkKFAsLFCocGBwqKioqKioqKioqKioqKioqKioqKioqKioqKioqKioqKioqKioqKioqKioqKioqKioqKv/AABEIARgB+AMBIgACEQEDEQH/xAAfAAABBQEBAQEBAQAAAAAAAAAAAQIDBAUGBwgJCgv/xAC1EAACAQMDAgQDBQUEBAAAAX0BAgMABBEFEiExQQYTUWEHInEUMoGRoQgjQrHBFVLR8CQzYnKCCQoWFxgZGiUmJygpKjQ1Njc4OTpDREVGR0hJSlNUVVZXWFlaY2RlZmdoaWpzdHV2d3h5eoOEhYaHiImKkpOUlZaXmJmaoqOkpaanqKmqsrO0tba3uLm6wsPExcbHyMnK0tPU1dbX2Nna4eLj5OXm5+jp6vHy8/T19vf4+fr/xAAfAQADAQEBAQEBAQEBAAAAAAAAAQIDBAUGBwgJCgv/xAC1EQACAQIEBAMEBwUEBAABAncAAQIDEQQFITEGEkFRB2FxEyIygQgUQpGhscEJIzNS8BVictEKFiQ04SXxFxgZGiYnKCkqNTY3ODk6Q0RFRkdISUpTVFVWV1hZWmNkZWZnaGlqc3R1dnd4eXqCg4SFhoeIiYqSk5SVlpeYmZqio6Slpqeoqaqys7S1tre4ubrCw8TFxsfIycrS09TV1tfY2dri4+Tl5ufo6ery8/T19vf4+fr/2gAMAwEAAhEDEQA/APpGiiigAooooAKKKKACiiigAooooAKKKKACq0enWMWoy38VnbpeTKEkuViUSOo6AtjJA9Ks0UAFFFFABRRRQAUUUUAUhq1m2tNpQmH21YROYiDnYTjP51Tv/FWkaZ9vN5dhBp0ayXXyk+WG+709fSsfxsV0XUdK8VfdjsJDDdt/0wk4J/AgGua1W3cfCPXdZvfluNUlW6ct/CnmKEH4KBQB22leONB1i/Sys70i5kBMcc0bRl8ddu4DP4VDffEHw7p2pXFjdXjie1YLMFgdhGSM8kDHSsLxjqmn6w2gWOjXdveamNRgliFu4dolU5diR0G3INP8P61pWl+KPGI1TULW2/05GKzSqpI8sdj1oA7iyvbfULOK7spknt5V3RyRnIYetWK474aRlfC80qRtFaT31xNZoy42wtISvHYY5rsaACiiigAooooAKo6brFlq1ibywnWWBXdGbBGGUkMDnpgg1eNeX6/NceH9X1rw/YkrJ4leOTTsD7skh2T4/wB0Df8AjQB1dz4/8PWlpZXEl6zR3wY25jhdzIFOCQAM4q7pvinSNW064vbG8WSG1BM/BDR4GTlTyOK5fUl0/wAPeOvCls00NpaW1jPEhlcIMBQByapzXFtqnirxXf6M6zWS6GYbieI5SSYByACOCQp/UUAdJYfEXw1qU8EVtqGDc48lpYnjWTPTBYAHNdQK8q1LV9JvPgtpmmQXlvdajNp9rHbW8Th5BLsXGAOQQfyr06yWVLGBbg5lWNQ59WxzQBPRRRQAUUUUAFFFFABRRRQAUUUUAFFFFABRRRQAUUUUAFFFFABRRRQAUUUUAFFFFABRRRQAUUUUABrB1bxt4b0G/NlrGr29pc7Q/lSMQcHoa3jXhXjfSLTXf2hrDTdSQyWtxbxiRQ2CRtY9RSY0elf8LP8ABf8A0MVl/wB9H/Cj/hZ/gv8A6GKy/wC+j/hWX/wpTwV/0D5f/AhqP+FKeCf+gfL/AOBDUahoan/Cz/Bf/QxWX/fR/wAKP+Fn+C/+hisv++j/AIVl/wDClPBP/QPl/wDAhqP+FKeCv+gfL/4ENRqBqf8ACz/Bf/QxWX/fR/wo/wCFn+C/+hisv++j/hWX/wAKU8Ff9A+X/wACGo/4Up4K/wCgfL/4ENRqBqf8LP8ABf8A0MVl/wB9H/Cj/hZ/gv8A6GKy/wC+j/hWZ/wpTwV/0D5v/AhqT/hSngn/AKB8v/gQ1GoGp/ws/wAF/wDQxWX/AH0f8KP+Fn+C/wDoYrL/AL6P+FZf/ClPBP8A0D5v/AhqP+FKeCf+gfN/4ENQGhqf8LP8F/8AQxWX/fR/wo/4Wf4L/wChisv++j/hWX/wpTwV/wBA+X/wIag/BXwV/wBA+X/wIajUNDbsfiD4U1K+hs7HXLWe4mbbHGjHLH0roxXgOoeGdM8K/Hbw9Y6NC0MDFXIZy3OD3Ne/0IGFFFFMQUUUUARzwRXUDQ3MayxOMMjjII9xXLeJvDfiHV7gJo/iGHTbDygjWj6ek6sR3yT+ldbRQB4zomkeLh461nQLHxNZWbabBBKbiLSIgZPNBOMDpjFd9onhF4Ell8UTWet3rybhdGxSIgemBnP1rI8P8fHTxePXT7E/o9d/QAiqqqFUAADAAHSloooAKKKKACiiigAqGa0gmmimkhjaaHPlSMoJTIwcHtU1FAHm+teC/Fl4s9xdeLbSeOLfJFHNo8b7BycZJ/DNZXg3SvGniDwfa39t4utbGG4Vs26aTGVHJHqM16rfjOm3I/6ZN/I1yXwiOfhnpvsZB/4+aAOg0nw9p+mQwMlna/a0jCvPFAqF2xy2B0yecVq0UUAFFFFABRRRQAUUUUAFFFFABRRRQAUUUUAFFFFABRRRQAUUUUAFFFFABRRRQAUUUUAFFFFABRRRQAV4vr3/ACc7pP8A1wj/APQHr2ivF9e/5Oc0n/rjH/6A9JjR7RRRRTEFFFFABRRRQAUUUUAFFFFABRRRQB4t4z/5OI8Of7qfyavaa8W8Z/8AJxHhz/dT+TV7TSGFFFFMQUUUUAFGKKKAOA0Lj48eKx66bZH/ANCrv64DRePj14n99KtD+rV39ABRRRQAUUUUAFFFFABRRRQBDeDNjOP+mbfyrjvhD/yTWxHpJKP/ACIa7K5/49Jf9w/yrjfhCf8Ai3NqPSeYf+RGoA7eiiigAooooAKKKKACiiigAooooAKKKKACiiigAooooAKKKKACiiigAooooAKKKKACiiigAooooAKKKKACvF9e/wCTndJ/64x/+gPXtFeL69/yc7pP/XFP/QGpMaPaKKKKYgooooAKKKKACiiigAooooAKKKKAPFvGf/JxHhz/AHU/k1e014t4z/5OI8Of7qfyavaaQwooopiCiiigAoorP16SSHw7qUsLlJI7WVlZTgqQhIIoA4/SOPj74j99ItT/AOPNXoFfE+keMPEh8U297/bl/wDariSKGabz23SIG4UnuOTxX2uDxSG0LRTfNTdt3ru9M80u4HOCOOvPSmIWikVlYZUgj1BpaACiiigAooooAjnGbeT/AHD/ACrivhB/yT6IH+G6uB/5Eau3l5hf/dNcP8ID/wAUKR/dvrgf+RGoA7qiijNABRRRQAUUUUAITjrSbh61518UZ7pL/SYbW5kg85ihKMR1IHb61H/wrjXsf8jI3/j/AP8AFV1xw8ORTnO1zzp4yp7WVOnTbselbh60ZHrXmv8AwrjX/wDoZG/8f/8AiqX/AIVvr/8A0Mjf+P8A/wAVT9jS/wCfi+5i+tYj/ny/vR6TuHrRuHrXm3/Ct9f/AOhkb/x//wCKo/4Vvr//AEMjf+P/APxVHsaP/Pxfcw+tYj/ny/vR6TuHrRuHrXm3/Ct9f/6GRv8Ax/8A+Ko/4Vvr/wD0Mjf+P/8AxVHsaP8Az8X3MPrWI/58v70ek7h60bh615t/wrfX/wDoZG/8f/8AiqP+Fb6//wBDI3/j/wD8VR7Gj/z8X3MPrWI/58v70ek7h60bh6ivNv8AhW+v/wDQyN/4/wD/ABVH/Ct9f/6GRv8Ax/8A+Ko9jR/5+L7mH1rEf8+X96PSdw9aMj1rzb/hXGv/APQyN/4//wDFVjeJ/DOteGtK+2za7LOCwXajOvX3zVRw1Ob5Y1Ff0Jnja0IuUqTsvNHsVArN8PO0nh2xZ2LM0CkknJPFaYrias7HpRlzRUgooopFBRRRQAUUUUAFFFFAAeleL69/yc7pP/XBP/QGr2g14vr3/Jzuk/8AXBP/AEBqTGj2gUUCimIKKKKACiiigAooooAKKKKACiiigDxbxn/ycR4c/wB1P/Zq9prxbxn/AMnEeHP91P5NXtNIYUUUUxBRRRQAVm+I/wDkVtV/685v/QDWlWZ4jP8AxS+q/wDXnL/6AaAPiDSP+Q3Yf9fMf/oQr7w7V8HaOQdasOR/x8x9/wDaFfeOMj60kUzyeys59A1S31vxJo0Uy3erFRex3jO8TSyFYzszt28gY7Zqlfa1qMGueIbEC4tdIk1ZUv8AUkbJgRo1G1fTJ6ntmu+g8BadBfQyG4vJbS3uPtUFjJNmGOXOQwHsSSAeBWjD4Y0+JNVjeMzR6rIZLlJDkElQvHtgUyS5plla6fpsFrp6hbaNAIwDnI9c96uVn6LpMeiaRBp0Es00UA2o0zbmC9hn26VoUAFFFFABRRRQAjDKke1cL8If+RNnH93Ubkf+RTXdmvOfhTqVja+G76G5vbeF11O5+WSVVP8ArD2JoA9FNcz488Qal4d8N3F5o9h9qnSNnLucRxADkt6/Stn+2tK/6CVn/wB/1/xrH8XTWeteENT06y1KxNxdW7Rx77lQuSO5zQBU8V69qljbaAmmXFray6lciKSa5TciDy2bpkdxVG08Wapa6pqmm6lfafd/ZdPa8W+tEOyHGfldcn0z1qXxHp2n66PDsU15ps9vYXQkukkuFwVEbLx68kVdv7Dw/F4X1TT9Ck0u1lvLaSMbJkUMxUgZNAE1x4107T1s7e5aa6vLi0F0sdtAWLp0LAdhmtzS9SttY0uDULCTzbe4QPG+MZFchplnDa+JLO+l1DTzFDoYsWIuVJ8zeG/LArS8Gta6H4Ts9OvdRsfPh37tlwpHLsR+hoA574of8hrQv+uw/wDQ1r0gfdFeY/Ei7t7vWNENrcRTBZhny3DY+dfSvTh90fSuyt/Bp/M87Df7zW+X5C0UUVxnohRRRQAUUUUAFFFFABRRRQAVw3xX/wCRRX/rstdzXDfFf/kUV/67LXRhf40Tjx3+7T9DpfDf/It6f/1wT+ValZfhv/kW7D/rgn8q1Kxn8TOil/Dj6BRRRUmgUUUUAFFFFABRRRQAV4vr3/Jzuk/9cI//AEBq9orxfXv+TndJ/wCuEf8A6A1JjR7RRRRTEFFFFABRRRQAUUUUAFFFFABRRRQB4v4z/wCTiPDn+6n/ALNXtFeLeM/+TiPDn+6n/s1e00hhRRRTEFFFFABTZI1ljaORQ6OMMpGQR6U6jNAHmFl4c0Vfjpf2w0ixECaJDKkX2ddqv5xG4DHB969PFcFb8ftAX3v4fi/9HNXe0AFFFFABRRRQAUUUUAFFFFAAa5K4+Fngi7uZLi58NWMksrF3cqcsx6nrXW0UAcd/wqTwF/0K9h/3wf8AGj/hUngP/oV7H/vk/wCNdjRQBxv/AAqTwF/0K9j/AN8n/Gj/AIVH4C/6Fex/75P+NdlRQBxv/Co/AX/Qr2P/AHyf8aP+FR+Av+hXsf8Avlv8a7KigDx7xh4U0Pwvq2kJ4f0yGwWedTIIs/MQy4zk17APuivN/ih/yGtC/wCuw/8AQ1r0gfdFddb+DT+Z52G/3mt8vyFooorkPRCiiigAooooAKKKKACiiigArh/it/yKK/8AXZa7iuH+K3/IpL/12WujC/xonHjv92n6HS+G/wDkW7D/AK4J/KtOszw3/wAi3Yf9cE/lWnWM/iZ0Uv4cfQKKKKk0CiiigAooooAKKKKACvF9e/5Od0n/AK4R/wDoDV7RXi+vf8nO6T/1wj/9Aekxo9oooopiCiiigAooooAKKM0UAFFFFABRRRQB4t4z/wCTiPDn+6n8mr2mvFvGf/JxHh3/AHU/k1e00hhRRRTEFFFFABRRRQBwcXH7QFz7+H0/9Hmu8rg14/aAk9/D6/8Ao413lABRRmkzQAtFGaM0AFFJmloAKKKKACiiigAoopkk0cK7pXVFzjLHAoAfRUck8UKhpZERT0LMAKEuIpIzIkiMg6srAgUASUUgYMAVOQehFLQB5t8T/wDkNaF/12H/AKGtekD7orzf4of8hrQv+uw/9DWvSB90V2Vv4NP5nnYb/ea3y/IWiiiuM9EKKKKACiiigAooooAKKKKACuH+K/8AyKK/9dlruK4f4r/8iiP+uy10YX+NE48d/u0/Q6Xw3/yLdh/1wT+VadZfhv8A5Fuw/wCuC/yrUrGfxM6KX8OPoFFFFSaBRRRQAUUUUAFFFFABXi+vf8nO6T/1xj/9AavaK8X17/k5zSf+uMf/AKA1JlI9oriviR8R7f4c2Njc3OnS3wvJWjCxSBNuFznmu1rxr9oKNJW8IRyqGR9U2sp7ggcUyT0vwj4mtvF/hez1qyRo47lSTGxyY2BwVJ9RSeL/ABRa+DvCt5rd9G0sdqoIiU4aRicBR7kmvP8A4QTP4f8AEvifwVcEgWV2bm0U94n9P0qb4pH/AISXxj4Z8FxndDNOb+/HYRRjIB+pzQPqdP8ADvx9B8QdDn1K2sZLJYZzCY5JA5JwDnI+tWvGXjzRPA2nLda3OweQ4ht4l3SSn2H9TXBfs4HPgjU+w/tJ+P8AgIqj4egTxv8AtDa1f6oq3FtoS+VaRvyqtnAOPzNAGmfjH4i8n7cnw11o6aBu84n5tv8AextruPBfjvRvHWltd6NKweM7Z7eUbZIm9CP610e0Vx+j/DjT9D8eX/ifTrmaFr5NslogAiJ7t9c80CHeK/H8HhXxRoOiy2Ety+tSmNJUkAEWCoyRjn71dfmvGfi9/wAlY+Hv/X23/oaV7NQByGu/ECDQ/iBovhZ7CWaXVlLLcLIAseM9R1PSuvzXjHj/AP5OM8Df9c2/9nr2fvSA8W8Z/wDJxHh3/dT/ANmr2mvFvGf/ACcR4d/3U/k1ezvIkS7pHVF9WOKBjqK5zVviB4W0RW/tHW7ONl6oJAzfkK5yy+Ovge8v5rf+0WhSNQwmmjKo/OMD3piPRqK5bTfiV4Q1ZpBZa7aMYwC26QL/ADrQ/wCEv8O/9Bux/wC/6/40AbNFY3/CX+Hf+g3Y/wDf9f8AGj/hL/Dv/QbsP/Ahf8aAOcPH7QA9/D//ALWNd5XmEniPRf8AhecV2NUtPs/9hmMy+cu3d52cZ9a7b/hMPDv/AEG7H/wIX/GkBzFr/wAJJr/iLxGtn4kksItPvRb28C2sbrjy0bkkZPLHvVu08Z3H/CvrzVL+NF1GzkktJEjHyyTq20bR6E4OKw49SudL13W59F17w6bfVLr7Qr3Fyd0XyKnQdfu560xtL8PS6RpekXXiTT7myju3vNSLThWupCS3GDwNx9egFMDe8N32ta1od/o+o6mbTXbGUJLdQxJkq2GVgpGOVOPwNV/B6+IL7VdTk1LxNPcQaZqD23km2iUSqqqckhcj73b0qvp0HhbQPGMep+H9Z062s57Zob6BrssZGByjgknkZI+hp0F3p9npPiOGz8SaWtzqt3LPA5nGIw6qvPvwaAJdA8XajeeMSL11Oj6m0sem/IAVaI4OT33DJH0rv815Pc+HPBlro9kfD+r6da6vYSRyw3L3hKllPzZG7GGGe3eu9Xxf4e2jdrdhu7/6Qv8AjQBt0Vjf8Jf4d/6Ddj/3/X/Gj/hL/Dv/AEG7H/v+v+NAGzRWN/wl/h3/AKDdj/3/AF/xo/4S/wAO/wDQbsf+/wCv+NAGya5Hxpa6JG0Op+IfOu1jQw22nJ83nyt0CoPvN29vatX/AIS/w7/0G7H/AL/r/jXOa7F4S17WLbU5fFX2W6tozHE1teooUHrwc8n1oA57WdNu9O8K+DLHX7GfUpRqLGWxjYSNtKyMseSQG2ggcn+GrVpp9zp39v6tZ6DLo2kLpbr9hu3B+0SgE7tisdoxx15rUvta8FaXZaVJqvicXJ065MsE0t0HdnIYfNjqME/pVLxF8Y/AT6W9lPqbXUN6rQS/ZVJKKwwSfTrQBe/tvXrrUdO0fQjZWaSaKt88s0TPsIYKFVcjg5/DFdL4S1ibXvCtlqV1GkU8yHzFT7oZWKnHtkVy/h7xV4C1HUIL3S9ch+0R2IsUSaXYfL3BuQe+R1rr9BsbHStHgsdLkEltFnYd4bqSx5+poA4j4of8hnQv+uw/9DWvSB90V5v8UP8AkM6F/wBdh/6GtekD7orrrfwafzPOw3+81vl+Rk694q0TwvDFL4g1KCwjmYrG0zYDEdRWVafFHwRfXCQWvifTmlc4VTNtyfxrmPi9DHP4o8CRToskb6vhkdchhgcEGux1XwH4Y1nTpbO80Ox8uRSNyW6qy+4IGQa5D0ToFdXUMh3KRkEd6paTrmm67DNLpF5FdxwytDI0Zztdeqn3FcH8Gr66TS9Y8PXk73B0O+a2hkc5Jj6rn6Vy/wAL/iB4c8K6brljrd8be4fWbiUL5bN8pIweB7UAex6nr2maNNaxapexWz3kvlW6yHHmP6D3qhrvjnwz4ZvEtdf1m1sJ3TesczYJXpmvK/HvjjQPFniPwhDoV59okh1VHceWVwOmea9mu9G0zUJRLf6fa3UijAaaFXIHpkigDmj8XPAQGT4p0/8A77P+FdNpeq2WtabFqGlXMd1aTDMc0ZyrD2ryz4X6Lpdz4x8eR3Om2cyQ6ttiWSBWEYweBkcCvS9Ts7u38PT23hhbW0ugm223R4jjOeu0fjQBM+tacmtx6Q15ENQliMyW2fnKDgtj0q6TXivhvw7c+HP2gbVNS1ObVdQu9HkuLq6lGNz78YUdlAGAK9F8Y6R4g1y3gsdC1RNKt5WIvLgLul2eiehPrQBsabrOnau1yumXcVybSYwT+W2dkg6qffmuV+K3/Ior/wBdlrD+BVlHpmleI7GFneO31mWJWc5YgBRkn1rc+K//ACKS/wDXZa6ML/GiceO/3afodJ4b/wCRbsP+uCfyrUrL8N/8i1p//XBP5VqVjP4mdFL+GvQKKKKk0CiiigAooooAKKKKACvF9e/5Od0n/rjH/wCgNXtFeL69/wAnO6T/ANcY/wD0BqTKR7RXjn7QH+t8G/8AYWH9K9jriviH4Ck8cPopiv1s/wCy7z7Sd0e/zOnHUY6UyTmPHQ/4RL4y+HPE8Y222og6fdt0HP3Sam8Aj/hJvH3izxg/zQqx06yJ7In3iPqcV1nxC8Fx+OvCsmkm4FrNvWSGcpu8th3xkVY8GeE4vB/g610OGXzjEh8ybbjzHPJbFIZwH7N//Ij6n/2EX/8AQRVPwlKvhP8AaH8QaXfsIY9YUTWrucBznIA9+T+Vdz8M/Aknw/0G606W/W9M9y04dYtm3IAxjJ9Kk8e/DjSvHlrCbqSWz1C1O62voDh4z6e4oA6/NcTZfEeHUfihceEbCya4W2i3zXiSArG3dSK5g/Dv4mtb/YD8RybEjaZPIPnbf97r+tdh4D+HeleArCWOxaS6vLg7rm8n5eU/0HtTEcL8bnXT/HHgLVp/lt4L5llc9F+aM/yyfwr2ZXDKCpBBGQR3rC8ZeDtL8b+HpNJ1lG8ssHjljOHicdGU/wCcivOoPhh8R9KgFho3xEZbBBtjE0RLovoOuPzpDIvFsq6n+034Vtbf53sbdnlwc7eGPP5ivaa4LwD8L7Twde3Gq3t/Nq+t3QxLfXHUA9Qo7Z9a72gDxbxn/wAnEeHf91P5NXqPiDwtpfie2EGrxPIgGBskZMfka8u8Z/8AJxHhz/dT/wBmr2mgDxjWP2bfD90zSaTqN5ZOeiuRIv68/rXOWf7M96b6VNQ12MWwXMUkMXzFs9CD7V9FUYoC54hp/wCzRosTP/aer3dyCPkEahNtX/8Ahm3wl/z9ah/38H+Fev4paAuzx/8A4Zt8Jf8AP1qH/fwf4Uf8M2+Ev+frUP8Av4P8K9gopgeP/wDDNvhL/n71D/v4P8KP+GbfCX/P1qH/AH8H+FewUUAeP/8ADNvhL/n61D/v4P8ACj/hmzwl/wA/eof9/B/hXsFFAHj/APwzb4R/5+9Q/wC/g/wo/wCGbPCX/P1qH/fwf4V7BRQB4/8A8M2+Ev8An71D/v4P8KP+GbPCX/P3qH/fwf4V7BRQFzx//hm3wl/z96h/38H+FH/DNvhL/n61D/v4P8K9gooA8f8A+GbfCX/P3qH/AH8H+FH/AAzb4S/5+tQ/7+D/AAr2CigDx/8A4Zt8Jf8AP1qH/fwf4Uf8M2+Ev+frUP8Av4P8K9gooA8V1D9mnw/Jbgabqd5by7uXfDgj0xWFqP7M10ixf2TrySEt+8NxFjavtjqa+h6MUBdnh2kfs0aTEVfWtXubph1SFRGp/rXp3hrwJofhRR/Y8EqHGCZJmfP5mujxRQI82+J//IZ0L/rsP/Q1r0gfdrzf4n/8hrQv+uw/9DWvSB92uut/Bp/M87Df7zW+X5HlXxku7ew8ReBrq9mSC3h1XfJLI2FUADJJrodT+LfgnTrGSceIbO5dVykNvIJHc9gAK6bVdC0nXI401nTbS/SMkotzCsgUn03A4qpaeDPDOnziex8P6Zbyr0eK0RSPxArkPROS+D2kX1voup65qtu1tc65eNdiFxhkQ/dB/CqHwUsbS60DXnuLaGVhrlyAzxhjjI9a9VCgdKq2Gl2GlxyR6bZwWiSyGWRYIwgdz1Y46k+tAHmHxas7W113wWba3hhLauoJRAuePavWu1VLzSrDUXge/sre5a3fzITNGGMbf3lz0PvVugDy34Uf8jt8QMf9Bf8Aoa9SPSqlnpdhYT3M1lZwW8t0/mTvFGFaVv7zEdT7mrdAHmV1/wAnMWA/6gL/APow16YeKrHS7FtUXUjZwG+WPyluTGPMCddu7rj2q1QB5p8Gz8vi3/sPT/0rT+K//IpL/wBdlrrrLS7HTfO/s+zgtfPkMsvkxhN7nqxx1PvXIfFf/kUl/wCuy10YX+NE48d/u8/Q6bw3/wAi3p//AFwT+VadZfhv/kWtP/64J/KtSsZ/Gzopfw16BRRRUmgUUUUAFFFFABRRRQAV4vr3/Jzuk/8AXBP/AEBq9orxfXv+TndJ/wCuEf8A6A1JlI9oooopkhijFFFABijFFFABiiiigAoxRRQAYooooA8W8Z/8nEeHP91P5NXtNeLeM/8Ak4jw5/up/Jq9ppDCiiimIKKKKACiiigAooooAKKKKACiiigAooooAKKKKACiiigAooooAKKDRQAUUUUAebfFD/kNaF/12H/oa16QPuivN/ih/wAhnQv+uw/9DWvSB90V2Vv4NP5nnYb/AHmt8vyFooorjPRCiiigAooooAKKKKACiiigArhviv8A8iiv/XZa7muH+K//ACKI/wCuy10YX+NE48d/u0/Q6Tw3/wAi3Yf9cE/lWpWX4b/5Fuw/64J/KtSsZ/Ezopfw4+gUUUVJoFFFFABRRRQAUUUUAFeL69/yc7pP/XBP/QGr2ivF9e/5Od0n/rgn/oD0mUj2iiiimSFFFFABRRRQAUUUUAFFFFABRRRQB4t4z/5OI8Of7qfyavaa8W8Z/wDJxHhz/dT+TV7TSGFFFFMQUUUUAFFFFABRRRQAUUUUAFFFFABRRRQAUUUUAFFBrhpvi/4QgupoGvLlnhkMb+XZysAwOCMhcUAdya5jxt4hutH0eaDRwr6rLBI8IYZWJVUkyN7D9TWUfjJ4P/5+b3/wAm/+JrmPEvin4feI2ubmS61SK+ltWt0lS2uFAGDjIA5GTQB0Gv8AiLUYvDXhKb+1xpjanJEt3dmNTgGEseDwOQKh0/xPfQ3us2y65/bFha6c1z/aEUChoJBn5ePlY45rmY/E/g+PSfDNj9vupYtHmEs4m0+d/O/dspAyvHLZGa39U+JPgu78O3+mWMlxam7t3iDLpkoUFlIyQF96AOil8apaSWNjBY3mp3txYC9AhQDMecEnnAOe3vW/omr2+vaLbanZbvJuU3KHGCOxBHqCK8t0/wAd+GLLXbW/bULp0g0cacUGmz5LBw277vTjpV7wt8S/C3h/w3a6ZPeXk0kG/Lpp0wBy5b+770AWvih/yGtC/wCuw/8AQ1r0gfdFeN+KvF2k+LNV0l9HedhbzqH863eLksuMbgM/hXsg+6K7K38Gn8zzsN/vNb5fkLRRRXGeiFFFFABRRRQAUUUUAFFFFABXD/Fb/kUV/wCuy13FcP8AFb/kUV/67LXRhf40Tjx3+7T9DpfDf/It2H/XBf5Vp1meG/8AkW7D/rgn8q06xn8TOil/Dj6BRRRUmgUUUUAFFFFABRRRQAV4vr3/ACc7pP8A1xj/APQGr2ivF9e/5Od0n/rjH/6A1JlI9oooopkhRRRQAUUUUAFFFFABRRRQAUUUUAeL+M/+TiPDn+6n/s1e0V4t4z/5OI8Of7qf+zV7TSGFFFFMQUUUUAFFFFABRRRQAUUUUAFFFFABRRRQAUUUUAB6VwPwiUHwtfMQDu1S6PT/AKaGu9fhD9K4X4Q/8ibOf72o3J/8imgDuti/3R+VG1f7o/KlooATav8AdH5UbV9B+VLRQAm1f7o/KjaPQflS0UAea/E8Y1nQsf8APYf+hrXpI+6K83+KH/Ia0L/rsP8A0Na9IHQV2Vv4NP5nnYb/AHmt8vyFooorjPRCiiigAooooAKKKKACiiigArhviv8A8iiv/XZa7muG+K//ACKS/wDXZa6ML/GiceO/3afodL4b/wCRasP+uCfyrUrL8Of8i3Yf9cE/lWoKxn8TOil/Dj6BRRRUmgUUUUAFFFFABRRRQAV4vr3/ACc5pP8A1xj/APQGr2ivF9e/5Od0n/rjH/6A1JjR7RRRRTEFFFFABRRRQAUUUUAFFFFABRRRQB4t4z/5OI8Of7qf+zV7TXi3jP8A5OI8Of7qf+zV7TSGFFFFMQUUUUAFFFFABRRRQAUUUUAFFFFABRRRQAUUUUANl4hf/dNcP8IP+RFJ/vXtwf8AyIa7a44tpP8AcP8AKuK+EA/4t9Ef711cH/yI1AHc0UUUAFFFFABRRRQBxPj7wzqmvXNjJpQizb5JLvtwcggj8qy/7L+I/wD0EY/++1/wr0qiuqOJlGKhZO3dHBUwMJzc+Zpvs7Hmv9l/Ef8A6CMf/fa//E0f2V8R/wDoIx/99r/8TXpVFV9bl/KvuJ+oR/nl955r/ZXxH/6CKf8Afa/4Uf2V8R/+gjH/AN9r/hXpVFH1uX8q+4PqEf55feea/wBlfEf/AKCMf/fa/wCFH9lfEf8A6CMf/fa/4V6VRR9bl/KvuD6hH+eX3nmv9lfEf/oIp/38X/4mj+yviP8A9BGP/vtf/ia9Koo+ty/lX3B9Qj/PL7zzX+yviP8A9BGP/v4v/wATR/ZXxI/6CMf/AH2v/wATXpVFL61L+VfcH1CP88vvPNf7K+I//QRj/wC+1/wqnqfhbx3q9p9n1G5hnizkK0igZ/AV6tRVLGTTuor7hSy6ElZzl95R0a1kstGtLafHmRRKrYORkCr1FFcbd3c9CMVFWQUUUUigooooAKKKKACiiigArxfXv+TndJ/64x/+gNXtFeL69/yc7pP/AFwj/wDQGpMaPaKKKKYgooooAKKKKACiiigAooooAKKKKAPFvGf/ACcR4c/3U/k1e014t4z/AOTiPDn+6n8mr2mkMKKKKYgooooAKKKKACiiigAooooAKKKKACiiigAooooAiuv+PSb/AHG/lXG/CH/knNofWeY/+RGrsbw4sZz/ANM2/lXH/CH/AJJtY+8kp/8AIjUAdtRRRQAUUUUAFFFFABRRRQAUUUUAFFFFABRRRQAUUUUAFFFFABRRRQAUUUUAFFFFABRRRQAUUUUAFFFFABXi3iB1T9prSndgqiBMsxwB8jV7Sa868afCG18ZeIzq82sXNnIYli8uKNWA255yee9JjR33260/5+of+/go+3Wn/P1D/wB/BXkf/DPNl/0Mt/8A9+lo/wCGebL/AKGW/wD+/SUahoeufbrT/n6h/wC/go+3Wn/P1D/38FeR/wDDPNl/0M1//wB+ko/4Z5sv+hlv/wDv0lGoaHrn260/5+of+/go+3Wn/P1D/wB/BXkf/DPNl/0M1/8A9+ko/wCGebL/AKGW/wD+/SUahoeufbrT/n6h/wC/go+3Wn/P1D/38FeR/wDDPNl/0M2of9+ko/4Z5sv+hlv/APv0lGoaHrn260/5+of+/go+3Wn/AD9Q/wDfwV5H/wAM82X/AEM1/wD9+ko/4Z5sv+hmv/8Av0lGoaHrn260/wCfqH/v4KPt1p/z9Q/9/BXkf/DPNl/0Mt//AN+ko/4Z5sv+hlv/APv0lAaFfxfLHL+0L4daJ1ddqDKtn+9XtdeWaB8DrPQfEVlq0eu3dw9pJvEckSANx0z1716mKAYUUUUxBRRRQAUUUUAFFFFABRRRQAUUUUAFFFFABRRSM2B2z2zQBBfnGm3J/wCmT/yNcl8IuPhnpvuZD/4+aq3tz8T5vtMMWkeHPIfciM13KG2nIBPHXFZPhvT/AIn+F/D9vpNppfh2eO3BCySXcoZsnPZfegD1WioLNpzZwm9WNLkxr5qxHKh8cgE9s5xU9ABRRRQAUUUUAFFFFABRRRQAUUUUAFFFFABRRRQAUUUUAFFFFABRRRQAUUUUAFFFFABRRRQAUUUUAFFFFABRRRQAUUUUAFFFFABRRRQAUUUUAFFFFABRRRQAUUUUAFFFFABRRRQAUUUUAFFFFABRRRQAUUUUAB6V5vAkPiP+3Nb8Q3d/9lsb2S1t7W0kdfKRCFztTlmJ5r0iuWvPBs6ardX/AIe1q50h75t91EkaSRyPjG8Kw+VsDkjrQByGrX8958NEg0bX7qSdNVjtku5EKSx/PwjjvgEA+taFv4mutU8ReF7W4Z7a9t7u4ttRtwcAusJIOO4PUfWtyPwDZxaIuni8uZHN8t/NcyMGeaUEHJ7AHA6VYvfBVjeeN9P8TrJJDeWaOjKn3ZgVIBYeoyeaAOW0Hw6uv2evX9xqmpQ3keq3ccUkV0wEYRvlAXpgeldZ4F1a41vwbYXt6Q1wylJGA+8VYrn8cVlr4BvYmv4bXxNfW1jfXMtxJbwxxggyHLAPjIrqtM0220jTILCxTy4LdAiL7CgC3RRRQAUUUUAFFFFABRRRQAUUUUAFFFFABRRRQAUUUUAFFFFABRRRQAUUUUAFFFFABRRRQAUUUUAFFFFABRRRQAUUUUAFFFFABRRRQAUUUUAFFFFABRRRQAUUUUAFFFFABRRRQAUUUUAFFFFABRRRQAUUUUAFFFFABRRRQAUUUUAFFFFABRRRQAUUUUAFFFFABRRRQAUUUUAFFFFABRRRQAUUUUAFFFFABRRRQAUUUUAFFFFABRRRQAUUUUAFFFFABRRRQAUUUUAFFFFABRRRQAUUUUAFFFFABRRRQAUUUUAFFFFABRRRQAUUUUAFFFFABRRRQAUUUUAFFFFABRRRQAUUUUAFFFFABRRRQAUUUUAFFFFABRRRQAUUUUAFFFFABRRRQAUUUUAFFFFABRRRQAUUUUAFFFFAH//Z)

Figure : kết nối giữa DHT11 với vi điều khiển

* Nguyên lý hoạt động:

+ Để có thể giao tiếp với DHT11 theo chuẩn 1-wire vi xử lý thực hiện theo 2 bước:

Bước 1: Gửi tin hiệu muốn đo (Start) tới DHT11, sau đó DHT11 xác nhận lại.

Bước 2: Khi đã giao tiếp được với DHT11, Cảm biến sẽ gửi lại 5 byte dữ liệu là nhiệt độ và độ ẩm đo được.

* Bước 1: gửi tín hiệu Start:

![Diagram

Description automatically generated](data:image/jpeg;base64,/9j/4AAQSkZJRgABAQEAeAB4AAD/4RDcRXhpZgAATU0AKgAAAAgABAE7AAIAAAAGAAAISodpAAQAAAABAAAIUJydAAEAAAAMAAAQyOocAAcAAAgMAAAAPgAAAAAc6gAAAAgAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAGFkbWluAAAFkAMAAgAAABQAABCekAQAAgAAABQAABCykpEAAgAAAAMzOAAAkpIAAgAAAAMzOAAA6hwABwAACAwAAAiSAAAAABzqAAAACAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAMjAyMjowMTowOCAxMDoxNjo0NwAyMDIyOjAxOjA4IDEwOjE2OjQ3AAAAYQBkAG0AaQBuAAAA/+ELGGh0dHA6Ly9ucy5hZG9iZS5jb20veGFwLzEuMC8APD94cGFja2V0IGJlZ2luPSfvu78nIGlkPSdXNU0wTXBDZWhpSHpyZVN6TlRjemtjOWQnPz4NCjx4OnhtcG1ldGEgeG1sbnM6eD0iYWRvYmU6bnM6bWV0YS8iPjxyZGY6UkRGIHhtbG5zOnJkZj0iaHR0cDovL3d3dy53My5vcmcvMTk5OS8wMi8yMi1yZGYtc3ludGF4LW5zIyI+PHJkZjpEZXNjcmlwdGlvbiByZGY6YWJvdXQ9InV1aWQ6ZmFmNWJkZDUtYmEzZC0xMWRhLWFkMzEtZDMzZDc1MTgyZjFiIiB4bWxuczpkYz0iaHR0cDovL3B1cmwub3JnL2RjL2VsZW1lbnRzLzEuMS8iLz48cmRmOkRlc2NyaXB0aW9uIHJkZjphYm91dD0idXVpZDpmYWY1YmRkNS1iYTNkLTExZGEtYWQzMS1kMzNkNzUxODJmMWIiIHhtbG5zOnhtcD0iaHR0cDovL25zLmFkb2JlLmNvbS94YXAvMS4wLyI+PHhtcDpDcmVhdGVEYXRlPjIwMjItMDEtMDhUMTA6MTY6NDcuMzc1PC94bXA6Q3JlYXRlRGF0ZT48L3JkZjpEZXNjcmlwdGlvbj48cmRmOkRlc2NyaXB0aW9uIHJkZjphYm91dD0idXVpZDpmYWY1YmRkNS1iYTNkLTExZGEtYWQzMS1kMzNkNzUxODJmMWIiIHhtbG5zOmRjPSJodHRwOi8vcHVybC5vcmcvZGMvZWxlbWVudHMvMS4xLyI+PGRjOmNyZWF0b3I+PHJkZjpTZXEgeG1sbnM6cmRmPSJodHRwOi8vd3d3LnczLm9yZy8xOTk5LzAyLzIyLXJkZi1zeW50YXgtbnMjIj48cmRmOmxpPmFkbWluPC9yZGY6bGk+PC9yZGY6U2VxPg0KCQkJPC9kYzpjcmVhdG9yPjwvcmRmOkRlc2NyaXB0aW9uPjwvcmRmOlJERj48L3g6eG1wbWV0YT4NCiAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAKICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgIAogICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgCiAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAKICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgIAogICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgCiAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAKICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgIAogICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgCiAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAKICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgIAogICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgCiAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAKICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgIAogICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgCiAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAKICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgIAogICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgCiAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAKICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgIAogICAgICAgICAgICAgICAgICAgICAgICAgICAgPD94cGFja2V0IGVuZD0ndyc/Pv/bAEMABwUFBgUEBwYFBggHBwgKEQsKCQkKFQ8QDBEYFRoZGBUYFxseJyEbHSUdFxgiLiIlKCkrLCsaIC8zLyoyJyorKv/bAEMBBwgICgkKFAsLFCocGBwqKioqKioqKioqKioqKioqKioqKioqKioqKioqKioqKioqKioqKioqKioqKioqKioqKv/AABEIANICVwMBIgACEQEDEQH/xAAfAAABBQEBAQEBAQAAAAAAAAAAAQIDBAUGBwgJCgv/xAC1EAACAQMDAgQDBQUEBAAAAX0BAgMABBEFEiExQQYTUWEHInEUMoGRoQgjQrHBFVLR8CQzYnKCCQoWFxgZGiUmJygpKjQ1Njc4OTpDREVGR0hJSlNUVVZXWFlaY2RlZmdoaWpzdHV2d3h5eoOEhYaHiImKkpOUlZaXmJmaoqOkpaanqKmqsrO0tba3uLm6wsPExcbHyMnK0tPU1dbX2Nna4eLj5OXm5+jp6vHy8/T19vf4+fr/xAAfAQADAQEBAQEBAQEBAAAAAAAAAQIDBAUGBwgJCgv/xAC1EQACAQIEBAMEBwUEBAABAncAAQIDEQQFITEGEkFRB2FxEyIygQgUQpGhscEJIzNS8BVictEKFiQ04SXxFxgZGiYnKCkqNTY3ODk6Q0RFRkdISUpTVFVWV1hZWmNkZWZnaGlqc3R1dnd4eXqCg4SFhoeIiYqSk5SVlpeYmZqio6Slpqeoqaqys7S1tre4ubrCw8TFxsfIycrS09TV1tfY2dri4+Tl5ufo6ery8/T19vf4+fr/2gAMAwEAAhEDEQA/APpGiiigAooooAKKKKACiiigAooooAKKKKACiiigAooooAKKKKACiiigAooooAKKKKACiiigAoJopDQAZo3CvN/EPjXXNC8WXumhIZbe6tZG01/L+5Mi7mVz3GOfwqt4Z8aa/wCKbyzsRdW1hKNDh1KWZoQRO8pIGATwi45q+R2uK56jupa8+0bxRrN5qmsWd3dW2bC8t4EaOLhwygt3784q3rHxHh0fxRLo82mzOkLwRvcrKuA0wYp8vU8oQfSlyu9hna5ozXk938XJ9RtrOTRbUWpkdfM88iTKtGzDGOhytdB4N8fHxDdJpt1bGO9SxS6eQkKs2QM7B6AnHXim4SSuK53NGa80t/jJbXlms1ro07u4i2xm4QZ8xnUZPbBQ/nWxc/ES2t/DGl66bGY2d/KIXYsB5DHIG71BYYz7ilyyQzss0teY678VJIbS9hsLFra7gd40eYh1LxmMSqQOmPMAB71teF/H0esyyQX8DW1wbuS3gSJGkVgnBLMBhT9TRyytcDtKKQGlqQCiiigAooooAKKKKACiiigAooooAKKKKACism98TaNpt/8AYtQ1S1trnaG8qWUK2CcA/TPGabP4r0K2lnjuNXs43t3WOVWmAMbN90H0J7UWYGxRWLb+LdCur5bO31e0luWIAiWUFiTnHHvg/lWzmgBaKzNS8RaTo8wi1TUra0dk8wLNIFJXIG76ZIFaCvkZoAfRSZoBoAWiiigAooooAKKKKACiiigAooooAKKKKACiiigAooooAKD0ooNJ7AMzS5oorC7HYM0ZooouwsGaM0UUXYWDNGaKKLsLBmjNFJSuwsIXxwOtOzWY08n/AAkptt37oWgkC477yP5VpCqd0wFzRmiildhYM0ZooouwsGaM0UUXYWDNGaKKLsLBmjNFFF2FgzRmkJxWTdeKtAsrp7e91rT7edDh45blFZfqCaNWBr5prNisQ+NfDA5/4SHTP/AtP8a560+MPgzU4pfJ1lLd1BAW5Qpk9BinaQaHUS6fo7yXKy29qzygtOGIyQRgk56ZHFVhoPhyWGzjSxsmS3BW1CgfIO6rjt7dK8/1TwVrGqQ3niOyvEu2vrTbHax5UnJUg5zg425+lXvC3gHUYdS0zU73/RUtRIslozs2W81nEq46btx4PbFb8qSvzCO5Om6Iuq/bjbWiXsaAGXChgvbP07ZrB1Wy8NaJr1x4y1edJmuFhgQsqusRBKgpgZz83JrG134Yalquv6pqMerRxR3yGMQ7GG0ZU888n5f1qncfCLUZ7COAanbgKZAEaMlY1adZQUGeG+Xb9KaUVrzAdwfC3haE+X/ZOnREndt2Kpyc8/qaXyfDvhu3udRt7W2t/JhzIbdMvsHoBzjPpWR4y+Hg8V6jDex38llLHD5beWfvMGBU/hz+dY2s/CvUr++1Ga11aGGO8s5LVU2N8oYIAxOeoKZ/GpVn9oDZvfCXg/Xh5NolpbeTeK062yopkkU7vLcY55bOPethtT0CHUF8OskAa3jWQweUPLhAOVz2B7iuWT4Y3MWqw3cOoRx+Xqb35KockOFyh7H7ppvjXwPd3d3rGuxX8NupSOYIw4PlRsMMe4+bP1FP3W7cwtTsJdE8P3d9O01hYy3NyAJcopaQDB5/IfkK07SwtbBXFlbRW4kbe4iQLub1OOprxnw/4m8F+CtQn1DUPEUWqTSWltFC8SNJInlxiNuemWIzXp1v458MTwRyr4g00B1DANdICM+ozxWU7p2TuNNHQUuayLbxVoF7dJbWWtafcTyHCRRXKMzH2APNawOai7GLmjNFFF2FgzRmiii7CwZozRRRdhYM0ZooouwsGaM1HNNHbwtLM6xxoMs7HAUepNY//CaeGP8AoYdL/wDAtP8AGjUNDczTS2K5XWfiV4T0WxN5PrVrPGrBdlrKsr5Jx90HOKqRfELw94gksIdC1qGWeS6UGEHa7Lg5GDTV2w0KHjDwjrOueJ9RuLGK1Nrf6KdM8yeT/Vs0m4vtxzgfrWLc/DXXBJfLbuZY3ubJ4We5wJFhUBi69yccV2OueL7nRPEf9mNpjzRPZtdwyoSd4T/WL7EDBHrmuHv/AIr6pcm2utNgWApDM0kJO5JT5KuvPqN2D7iumMqj2JdjuNM0C9tviRquszQRLY3VnbwxYYEq8ZYk47fe4riLfwx4i1nXfElxYT3Fogu7mKNprmRRMDtKBVzhVBDHcK1Zfi2bS+nspbGOeW3sDcs0UvBYKrEH0GG/Sr+l/Ei5v9Z0/TptI8qW8VpN3mgAxhyoZc9emcdcEUJVFqGhzFz8OfFd7bj7T5EkvlTR/vLrft3yo4GT2AU10+k+FNfg0PxTaXN2d+pszWTNOWeIkHqw7AnjGDj6Cq+ufFZdH8Qappa2CTGxgaUMJfvFWUbT6H5v0rG1z4rX82ibLCGOxvFlkDzeZlf3c6IVT+8SGziq/eNBoZV54R8XR3GnaZcyXElxcmZkkjvZPLhOxQrMw9CCcd69wsxJDZwRTyebKqBXfH3iByalQ7kB65ANc74m1608O6hpNxqeoR2VnJPKsrSNhW/dMQPfkVjKbm7DtY6TNLmuGg+L/gu51ePT4dYjLyFgJWUrEuPVjgDNbv8Awmnhj/oYdL/8C0/xrLUehuZozVDTta0zVw50rULW9EZw5t5lfb9cHir1LULC5ozRRRdhYM0ZooouwsGaM0UUXYWDNGaKKLsLBmnU2nVpAAooorQQUGikPSk9gEopM0Z9K5yhaKTNLQAUUUUAFFFFABSUtJ2oAovaMNdN7vXabcRbO/3s5q8KySc+MGHb7CP/AEM1rCqluAtFFFSAUUUUAFFFFABRRRQAUUUUANddwwax7rwf4dvrl7m90SwuJ5Dl5ZLdWZj7nFbVFGoHPnwJ4UIx/wAI7pvP/Tsv+FYUXwc8C2QJh0GCSXcXV5iz7Sfqeg9K7yorr/j1lx/cP8qpNisjxiabVtL8QalY6Jc3bXtpeWcVlbxBzC6HHmjHTbjJJ7YqDT7/AFW48QWlvNdXS2cnie6ty4nk3mAJ8i4xgIDjBzXaN44/sjwvcz2elzagulqqXLRsFwTycZ64BH41d034gabqHih9H8gwYLok8mADJGqM6kdsbx+Rrr5na9iTO8DQyP4n8Q+de3rpYXflW4mlZl8soM8Hrznms6D4geKvsulTSWVgy6lPPEjGOVFjMTEBXPOC45B6DHet/WfiLpukatcWCQmd4YUffGRtd3faEB/nVnSPiDoOqWcEjXSW08xUGCQcqxZlA/EqwH0qPe3cQOJufil4lgdEeytYZWlnURvbu4lCYKhCDk5B6449Kt3XxK8TK16F0mK3aLbtWWGRvKPnKgDY+9uVi3GMYrqoNb8P6z4j0u5gVLmR0lWyvVJwCB86/lXVhAVwf5USnFfZCzPKB8TvEa20Mo0iO5/0edn8mF8tJG7AZGcqpUAjrnp6V2emXF34p8DSHUUtVkvYXT93uMZBGASCMjryK6QIB0AH4VR14Y8O6h2/0aTp/ums3JS0SsOxyVz8GvA18gM2hRRyFtzPAxjLHv0PQ+lbcPgHwnFEsaeHtOKoAozbqTx7kVuWn/HlB/uL/Kpqzbdx2Ma18IeHbG7jurLRLCC4iOUljt1VlPqDithV2rilpanUAooooGFFFFABRRRQAUUUUARXEEV1A8NxGskbjayOMhh6EViDwJ4UAx/wjum/+Ay/4V0FFMDk9U+Gfg/VbJrW40GzjRiDugjEbAj3Xmq9r8NfCmh3Vtd6PpVrY3EcysJQuWbAPy5J712dZHiAfJp//X9H/JqqLd7XFoRSeI9LTxQ+jXX7q7it0mEkoARlkbaFU+pI6U8SeG1jQq+mhVdkXBTAY9R9awtd8Atq3jiDxHDqr2s8MSRLCEyrKC24Ed8hj9OtZlp8I7SyTT2W9Ez2TvndDkToegbnqPWteWFtxanR6gPCOtaVd2891p727qIp3jlQFd3AGR0zjFU/P8K+CGjtJI1t0SN7sXDqGCAsAcHqMkjgDFcrpPwjlvdBkTV7j7HdPhEWFB+5CyM6uCOrfN1/Cun8S/DyPxHfwXE1+0QhsTaACMEn5lbd+a9Kr3FpcNS7q2t+H7LVLKzu7aO4uNRjaVSsSkCIY3OxP8PSrQufC0iW8Ql0tlmbfAmU+ck4yo7nIxWb4m8Cr4luoJJ70xJHZPakJGMncVO7816VX0P4cW2keILfVZLlbp4luCUeEYDyyByV/ugYAAqfctuB24GOBWB4j8MaZ4mksoNbhhubeKSQ/Z5VDeZlCMD0x1/CugrF1UD/AISTQP8ArvN/6JasY7jMG3+D/ge11OO+h0KAOgwIySY/qVJwTWyPAvhX/oXdN/8AAVP8K36KV3cLGfpehaVou8aTp1tZCT7/AJEQTd9cVo0UUhhRRUE91DbKGuJo4gTgF2Az+dAE9FMVtygg5HtQXx1oAfRUMtxHAUEsiJ5jbU3MBuPoPepN1ADqKTNFAC06m06tKYmFFFFaiCkfhTilpG5Wk9gMO68SW1n4gs9GnjnFzeKzQsI/kbb1G719qRPE1q0kEIhuPtNwHaK2Mf7wopwXx2XJHJ65qLxT4eOvQ2X2a4NndWdys8U4XJXsy/ipIqG58NTxeLoNf0uSITJYmxmgmztePcGUgjoQc/XPtUJQsMsp4psJZEih8555JHRLfyiJDsOGOD2HrWjp+pw6jbvNAJFCSNEwkQqQynB4PuKw7zw7dv4ntvEFo8P2yK3a2lhk3CN0JyMHsRj05raWw89C120iytGY2EEzooB7gAjn/a61Pu2Au7s9KTeKqHTISG/eXWGCg/6TJ/D078H1Pfvml/s6Hzd4e4z5nm4+0PjOMYxnGP8AZ6UvdAtb6xdX8aeG9BuhbazrdlZzsMiOWYBsfTtV8abCoQLJdfJvxm5kP3uucnn2z07YrzPxF8AtJ8Qa/c6o2tX8D3BBZGxKcgY+8xyfxpxUW9WJ36HXf8LR8Ef9DRpv/f4Vp6R4s0DxAzLomr2d8yfeSGYMw/DrXlX/AAzTpX/QxX3/AH5SuB8ReHrv4MfEbTbyznlurTAdJ2G0uvR0OParcYW0ZN5dT6cItjre8MftX2cAr22buv51e3YrldMWx1TVre6tJ55LefSgUb7S5JV3PO7OSfQ9R2rdOmQMGBkugGVU4upBgL079fU9T3qGl3LRd3ijfVU6dD5m/fcZ8wSY+0PjPpjPT26U1dNhTbiS6O0uQDcyH73XOTzjsO3bFLQC35gpd4qj/ZUG3b5l3jy/Lz9qkzjOc53dffrT302Fw+ZLn5yhOLmQY29MYPHvjr3zRp3At7/84pN+KqjT4VcMHuMiQyY+0PjJ7Yz09ulNXS4FVQJLo4Rk5upDw3XPzdfQ9R2padwLm8Uu8VSOlwlcebdD92sfF1IOB0P3uvqep7046dCX3F7nPmLJ/wAfD4yO2M9PUdDT93uBb3/5xSbxVRdNhXbh7k7XZhm5kPLdc88j0B4HbFINKgCbBJdY8vy8/apM49c7uvv1padwLu8YpN4+tVG0yFw+ZLr59mcXMgxt6Y5498de9L/Z0O/eHuM+Z5n/AB8PjOMYxnp7dPan7oFvfUU7BoX3HC7TuPoKgXTYVVQJLr5VZRm6kOd3XPPJ9D27YqC60u3FjKpkusfZ/LybqTOAOud3X/a6mhWvuBzMfgS0vLW6jttRuYtNvJkvE8h9r7wMcnuOAfrT5vBXhLTtWk1DVpYh52T5d5OAm9goZucctsH615B4o+KmozvD4d8DvcI2VR7mOWRpJJBxtjGflHrxz1p2l/AbxV4kH27xVqotZJSWIuHaeYn1POB9K3u09WRfsjuL61+Eo1W5n/tywtLplEZ8q64RlYMGA6ZyKhC/C5Li0mt/F1vEbVYgFW7GJGjdnVm45OXb86oxfs1ab5S+b4hu94HzbIFA/Dmn/wDDNOlf9DFff9+UqlJfzCs+xo6RqPw90bVLOW08XaebWzklnSNrgEmWQYJ9AAOw7muxHxQ8D/8AQ0ab/wB/hXn3/DNOk4/5GK+/78pQP2adJ/6GK+/78pUy5Jbsfvdj0a3+IfhW+3jTtbtbySNdzR2772x9BV86np2r6JdP5x+zeUyzcYZFxzx9K8yh+EFt4J0+7u7LUru984KsquNm1QeoKmltp47O2vlledYriBlfZM6/MB8p4PTPUdD3rnbip2TLV2tT123KiCMJkoFG0nuMcVLuFZ1lpsK2sJ8y5yD5mDcuRlhyMZ+76L0HapBpcAUKJbrhGTm6kPBP+919D1HanZdwLu71pN4qm+lwOrAyXWHRUO26kBAU5GDu4PqRye9OOnxFy++4BaQScXLgZHbGent0oshlveB/+qjeKpppsKbCHuTsLEbrmQ53dc5PPtnp2xSLpUCoF827wIvK/wCPuTOM5znd97/a6+9L3RF3eKN9U20yB2Yl7obip4uZB93p349/Xvml/s6HcDvuf9aZcfaXxk9uv3f9np7U/d7gWt4pd4qkulwqFAkusKrKCbqQ8Hr36+h6jtQdLgKsplusNGsZ/wBKkyAOhB3cH1PU96St3AubxS7xiqh06EuW33IJdXwLlwMgYHGent0NC6dCrIwe5JRmYZuXOdwwQeeR6A9O1GncC1vo3iqa6XAsaoJLrCx+WCbqQnHrnd97/a6+9K2mQNuzJc/Ntzi5kH3emOePf1707RAubqo6m9tttvtak5uFEWB0fBwf50/+z4vML77nPm+bj7Q+M4xjGfu/7PTPauD8U6hDNMtjZvc4t3JaQ3MhO4/jzjP4dsUuaMdWwMLx9d6vD8S45dMnmEMcEabA3G/bL8ykcAA7dwPXIrn9N8a+KfD+lMLCK8lSU/Kklv5jCQRLk4PIBfdW9b6VLfu0VstzM7JtbZK+cDvnPB9+tbEXgfVZmJMZj3ENl7lgOO2Af0q1iLpKwuVh4W+I9/c6jqS69az+QhQ2zJCFGCOQc966b/hPdN/54XH5L/jXO/8ACAaqCDuQ7WLDNyxGT/Me3agfD7UwAAy8KV5unzg/19+tZSk5O6GdH/wnmm/8+9z/AN8r/jR/wnum/wDPC5/75X/GucPw91NgQWT5gAcXTjp/L+tB+H+qbi25OX8zi5bGfTHp7dKn3hnTReOdLkcK6TxD+8yjH6GtGaayk1DTHl+eV3c2zKCRnyyTz/u5rzTUvD1xo0ka3e75wSrLOzA568/5x2rQ8PtHd6no9jLJc5haaNSLlxiMxMcjnhgeN3XHGaqnJc1mxHpu7A4o31VbToW3fPc/Myk4uZB93pjngeo796F06FXVvMuSVkMgzcOQSex55Ht0q7IC2GyeKdVO30+K2eNo5LhvKUqvmXDvkE55yeT7npVuk7DFrgviNo2p6o1nLosc5uoFfYQFeF84ykik9D6jpXeVzHijxd/wjmoWcDWLXEc8U00jq4GxY13HA7mqpt82gmcLd6V8QLC1vxpCXRuJtSklQrcIUEIRdgGTnGQRirt5o3jHU/OnnmvwF1hGithMqr9lBBzx171tj4nacraUtxp17bf2qyC3EqryGOFbGehNVofi5pD2jTS2F7CFeNcOq4+dioOQeBlT1rpvN7RJ0K3jHSvEuo+NLB4Lea40y1vLa4g8p1CoFDeaXBPJyVxWbYWHxAuZYJdXivB9nvxKirOgOwxMDnnB+fHHvW1J8XNKivHhl02/ASTYZAqlceaIievQMwqOy+KtrF5kOp28z3CyXRBgiwCsMjLtGTywA7fWhc6VuUNDV+Hw8Upa36+L0kVzOGtt7qx2EcjI967LNebxfFmyN1JK0MsltJFE1tDGg3ksrMxJzjohrT0n4maXrHiK30m1trsG5KiK4ZR5bFoRMB1yPlPp1rKcJt3sUrHbCnUyniogDCiiitRBQelFBpMBlGKWiucoSilooAKSlooAKSlooASuC+Lng8eLPBNysEe6+s8z25xySByv4iu9pr8qcjIprTUTPEP2fvFhvLK58N32PtFmvmWzMfmMRPzL/wABP869x74r5j8cafdfCn4wW+v6ZEy6fcS+fGBwrKT+9i4/z0r6R03UINV0+3vrKQS21xEssTj+JTyK1qxV00THsXKSlorEsSilooAKSlooASilooASjFLRQAgpaKKACuN+KniX/hF/AF7eIwE8gEMI9Wbj+Wa7Hoa+e/2idXlu9W0fw7bHcdpmZB1ZmO1B/PvVxs3qTLY2vgT4TtJLW48WXVqouLqVltM8+VH0OPqa9pArF8IaYNJ8I6VZCAwGC2RWjPVWxzn8a3KJu8nYI7DaWloqNChKBS0UrICG4hSeBopBlXGGHqK8i121bSLi8hlXcIQWAP8AEvUV7FXFfEXSXudEnvYE3SxxsjBRyykf41Lim0BseFdWGp6LEzH97GAsg/kfxFbteX+EtT/szVIhK2Ip1WOTPY9j+Feng5ppptiHUUlLVDEopaKACiiigBMUtFFABSUtFACUUtIaAM/W77+z9JuLjoVT5fqeBXl1rBLfX0cK5aSZ8E/Xqa7Lx9d7LS2tFPMjl2+g/wDrmue8OWFxc6lDcQBm+zTIz4OPlOck1hJc01ED0TTtOg021SG2QKoHJxyx96uUDpS1tZIBKKWimAlGKWiiwGH4n0oalo7BB++i+eP3x1Feb2OqPpOuWEqLktI6uT2AUkj8cYr2IivK/GOjSWHiW2liT/R5HkkBHRcoQR+Z/Wo5VzXYM9QtpkuIEljOUcBlPsamrkPBGqGa0bT5D88PKH1WuuFOLurgLSGlpD0qgGu4RctwMZJ9K8un1zWvG1zcT6D4X0zUtNtZZLaG5vblo2k42uVAHQ9Kd8cPFeqaFoNjpvh9yt7q0pg+QZk2Y5Cj1JIGe1dV8PtMvNI8EabZanZw2dzDCA0MLFgv1J/i9a740fZUFXlbXRIi93Y5CbRvFs7Wpm8C+H5Gs41jt2N8+Y1U5UDjsaij8O+KIkKJ4D8PBGADL9ufBAOR29Sa9bFLWPt/IdjyGTw14nlkZpPAXh5ixJP+nvyd270/vDP1qVdD8VpyPAvh/IZ2BN+/BcksenUkmvWaKf1jyDlPIz4e8UbWX/hAvDoVgAQL5+gzjt7n86mg0rxfa6kl/b+B/D8V1GwZJFvnBUhNg7f3Rj6V6tRS+sf3Q5TmvDd94rurmYeJ9KsbGIKDE1rcmQse4II4rpx0pgFPqE03cYUUUVYgpD900tIRxSewGRqeu22nX1rYnfNeXWTFBEMsQOrewHrWbf8AjjS9K+znUzNZpcXbWYkmjIVZAO/op9elT6t4cN14htdcspBHe28D22HBKvG/JHHIOR1rHt/A12Y7a31jUP7Yg3TG5F4pYsrgAKvoFAqYqFlcZc1Hx7aaZdx29zY3haW6FpGyICGcjI79Md63NJ1m11eGZrVjuglMM0bDDRuOoIrirn4bXcdvp1vp+p74rHUBeIboF2wBhY8+gHeui0jwhbWD6jNcu01xqV19puGUlRuHQAegxRJQ5dGB0WRS1ROk2vmB9jbvNM2d5+8RjNNGi2e1V8tsKjoPnPRutZ2QF8kUZqidGsyrAxtholhPzn7q9O/607+yLTzGfY24yLIfnP3gMCiyAubqMjv0qiuj2iOjqjbkd3X5z1YYam/2JZCER+W+0RmIfvG+6Tk96NAOF+LvhqTxdpNzY20e+6sbT7ba7V+ZnDEMufQr29cVxvwV+KGmaP4al0XxNfpaLavm1klJ5U9V9sH+dewy6BC2ryTOuYJLdIyu5s5Vsg/SvLte+EHgeTxk1teavfWN7qbSXMVugAjx1YKcY49K2XK9CWne6O7/AOFueBh/zMNt+Z/wpP8AhbfgY8/8JDbfmf8ACvLLf4WfDy7toZbPX9VuTPO0EMcSAvK6/e2rt6DuelSW/wAJfAN1cG2h1rWDOtqbsxGIBhGrbScFf7wxin7OIryPT/8Ahbfgb/oYbX8z/hS/8Lb8Df8AQw235n/CuKj/AGd/C0kcb/2xqI80AoGZATkZ6YoP7PHhQbQdbvvm6fvI+f0pcsOg7yO0/wCFueB84/4SC2/X/Cg/FvwP/wBDDa/r/hXn5+BvgpdbOktr2oC8WHzim5OEzjJOMdavH9nTwuNu7WdQG84XLp8304o5YBeR2Q+Lfgf/AKGG1/M/4Uf8Lb8Df9DDbfmf8K4a6+AXg2xtnuLnxBeRRLjc7yxgDnHp60+b9nvwlbQmW41y+ijVC7M8iABQMk9OlLlgK8jtv+Ft+ByP+RhtfzP+FH/C2/A/bxDa/r/hXExfs+eEZ4Ulh1y+aOSMSKwkTlSOG6dKjX4A+DpL77FHr969zs8zylkQsFzjOMU+WA7yO7/4W34H/wChgtfzP+FJ/wALc8DZx/wkNt+Z/wAK4OX4C+EItRgsjrOpmWdXZSu0qAmN25gMDr361YX9nnwm2AuuXpz0xLHz+lHJALyO0/4W14H/AOhhtfzP+FeJeItVtPFfx/tLvRZlvbUyQhGPKnaMnANdfffArwZps1ql1rmoq13craxbSrZlIJCnA46Gug0D4G+HvDWsRapBdXt1PEG8pJmG0MRweBStFaoXvM9E0m4e50m3nnOZJEBY4xVzIFY+meHre0061gmUmSANyrtjLdas/wBi2YVUCNhYfIHzn7np/wDXrNpXLL+aNwqidHsyzEo3zFc/Of4enenf2TaiTzNjbvOM/wB8/fIxn8u1KyAugikyKopo1mqgBHwquo+c9G696R9EspIXjaN9rxCJhvP3R070WQF/IHWqGuPt0C/YAEi3cjIyPuntT30q1dnZkYl5BI3zn7wHBqpqOgW9zpk8EKlZHSXYWc4DOMHPtTSQHnF9ZSadeNBIDlQrKw7gjINdVp/jeKCyiiuraaSVV2sy4w1T6z4Kh1CztVtT5U1vD5BLMSGX0J+vesU/Dq9IYGaAhgAfmYdOlYOHLLQZuf8ACfWf/PncfpS/8J7Z/wDPncfpWH/wru9zuE1vnfv+833v89qF+HV4qgCWD5c4+Zu/WnqBt/8ACfWf/PncfpQPHtp/z53H6Vhn4cXhUr5sGCgQjc33RzTj8O70kkywZJBPzN26Uve7iNsePrM/8udx+lH/AAntnj/jzuP0rEX4d3yuHWaDKsWHzN1NIvw5vFVVEsGFQoPmboetHvDNv/hPbT/nzuP0o/4T60/587j9Kwz8Or0ggywHIAPzN0HSnf8ACu77OfOgzvEn3m+8KNe4jb/4T6z/AOfO4/Sk/wCE+tO1ncfpWIPh1eDGJoOCSPmbv1pD8OLwqVEsGCmzG5un+e9GozcHj20/58rj8xQPH1n/AM+dx+lYjfDu9ZmJlgydufmbt0o/4V3ehg3nQZDFx8zdSMUaiK3iPWE1q/jnhjkjSOPZtc98k1peHGmttJilj+Tz9QSMkD7y4ORVYfDm8CjEsA2qVHzN0PWt1fCFpDpVrasxzFKjudxG/bngfnTpxtO7GdSMYxS5FUBpFoWaQo25pRMfnP3gMA//AFqF0e0Rgyo+QzsPnPVuta6CL+fSkyB1qgdFsjCYjG+wwmA/O33D26/rTm0i0kDhkb95t3fOf4elFkBd3UpIqj/ZNqJQ4RtwlMw+c/eIx/kUi6NZqIwqOBGrqvzno5y3ejQC9muU8a2sl42mwQklnkmbaB97bExA/MCtxtFsmUqY3wYxGf3h+6Dkd6o33h62vNWsro5Q29w0zKWPzt5ZUd+2c0JJ7gcDpt7JpupRXUYP7tvmHqO4rsP+E9s/+fO4/SqGqeADNqDzafIiJI7SFHJ+Vj1xVL/hXF4F2iWDGwpjc3Q/561gouOzGbv/AAn1n3s7j9KT/hPrP/n0n/MVjJ8Pb+NyyTW4YqFJJboKk/4QPU/+e9v+tJufQRYuvE2h3uo2l/daS0t1Z7vs8rhSY93XFXP+E+sgf+PSc/iP8ay/+ED1P/nvb/rR/wAIHqX/AD3t/wBaXNUejGbVv440+aUJLHLACRhmAIH5V0yNuUEdK4KLwHf+avnXEIjz820EnFd3DGIoVRchVAAz6CtIuXUCSiiirAKKKKACnU2nVpTEwooorUQUhPBpao607pod60UrQuIW2yKu4ocdcd6NwLeeKK8OtdS13Okw3ct2MatHFPcQSOYriLyySwyMqM4yPWr6SeL9OaWGxnudSt57G6vdLuWJ3Ry7QPIcd8E5XNT7LzC57FR0rxjUdWkTwrPFpcusPfrpSzS3W58eaSMjGMh854FaPi/W7iez8NQ6JcXDSx3SR3RO9UZTAxw5AzjcBz60exYXPVqK8x8Vaxfr8Ppo9Hh1ARxoht9QLndId+CMfe9eT2rB0bUdei1HQ5tSub8afDqlxFcSncY2jKZTnGSueMnvQqN1e4XPbKK8lmutatfFGkhJbm6tWEKSW251lhLOzCQHo4IIDA9AK9Rn1CytGC3d5BAW5AllVSfzNZyhyjuWqSqP9uaT/wBBSy/8CE/xrOu/G3hqyv0tLrXbKOZ13KhmB4+vSpswLJYnxcVydv2IHGe+81j+LPBp8U31rJJOtsLRkkhljJ8xWDcj6EZFa1nfaXqWpfa9Mv4bqXyApEMgYBNx54965vxX401DQfF1jptpZ+dbTxhpZPLY7MkjqBjsK2jzc3uiKel/DnUdGvrLUrO8tWvLO4uGSJlby3imOSvqGGBzWreeFNVl8VprkF3a+dNpx0+5RkYKqmTeGT37YPWuL/4WX4j1DQbtJtPW3eTCfaEikHkq8TtnGM53KB9TWrc+MtX0DwH4SlUpJd39ttna6RixdYi/Qc5JGPxrWSqN6i0N3xZ4GuvEGp6fc2mo/Yvstu8DSAEswZSOnTuDngiuan+EWoT2unK17ZfaLSJleQhzukMkbeYMn5TiPBx/eNQar8Q9du7a60+bT5LJ5rR3DIjh4z5QdcHHXccU/QfF+s2Wti12TXtreaqInklVmaFDFHgqMfd3FsntQlUjHQNLkt58JNQuLjUHXUbY/aVcLMA6yktJvDMe+3oPatvxF8P77W49JEeqLG9lbC3kJQqFO9G82MA8P8hH0NY3izxZrlt49hgtLaYQafK2y3jVv9LUxFsk9MZ4oPxC8Wy6Stzp+iJcs0ssIOxlDMsfmA89uGU+4FH7x2YaCv8ACS9kn1ENqNmYLiQvCDExK5n835hnHtxW14s+H8/iTVhdRXkVrGdPks5FKlg25SB8p4GCc5HPasyX4ga9Frul2zaeggvIraWRGibeglYjGegKjBNa/iDxP4g0jWNTt7bSxdQW9iby3kVT8+AQUP8AtZx+FJupcNDDuvhVqlxfyXCanZRI2nmy8qOF1HMKxluvqua39B8Bx6F4hTUbX7LGn9mpZvGkWCXHVwffv3ritV8ZeJLm6N3YCaGaG0u40McTGOfY8e2QLjrhnH4GtK9+Jur2GoalBJZRm2tI1K3ToyLncoY8jnrnFNxqNWDQq6h8L9XsdJnktLlbzy4rsR2iMwc+d5eAH6naUJ55wcc0WHwz1LUYrK7kht9LktnOY5WZ2dvNDlwQBtB5GMDFbnhjxxrms69YWN1Z2ojmtkuJJomJVw2/OwjjKlVBHuaxZ/Fuv6R4i1e4RJr1DfPBGjI2xUVVKoox1JJ59qd6mwabl/TvhfqtlrSX0mqWksf9pQXpiCOMCPflRknqG6+1el3WfssuP7h/lXNeDdc1fxA+oT6hDDb29vcPbxRBGD/KfvHPbHpXTXGPJYMcKVIY+grCpJuWpRU0Ji2hWZY5JjGSTWjXL/8ACY+FdE05Iptes0SBQuWlBb8hWpa+JNEvLWO4t9WsnilUMjeeoyD9TWbWotDToqkus6ZIwSPUbR3Y4CrOpJP51eHSpGJS0hOKpPrOlxuySalZo6nBVp1BH4ZoGXaoa6Svh7UCDgi2kwR2+U02bxBo8UTSPqtkqICWPnrwPzrJ/wCEy8K63p00EOvWbx3ETJlZQDjGDjNUtGI6G0/48oSevlr/ACFc74p8Xy+HdV02xg077Y+oLKUPnbNpjXcR0PUV0cAVbdFQ5UABT6jFYfiLwvYa9dWt7fzTwvYrJ5bxPt2hlwxP4VUWubUDlZ/jJYpFJNb2BeBdH/tRC8u1n+YqYsY4bIPPSteDxxqFxrWnaeuhqH1C1+1xH7UP9WApPbr836UH4ceHLq3kNr5iW8+mDTQIZMr5Gc8H1z3961oPC1jBq2n6ijTedp1r9khG7jy8Ac+/ArRulbRE6heeMtDsLy6tbu+SOazVGmU5OzeQFH1JI4qsnxE8MSXgtl1RPMMYkGVIXaVLDnGOgP5VU1XwL4f8R3d5qdxMzvcIqGWGUYjKMGByO4K9+nNRf8IB4bv5m1ATSTowAdkmGxtqFOccdGNCVK2tx6kmk/EzRtTu7iF2NuBdi2tmbJNySobIGMjrWtf+MNE0zU5bC+vliuYkDumCcAqWAz6kKTjrxWJZ/DbQTDC8VzcXUa3CXSOZg2WQALgjtgAcVoal4E0bVdck1O8SVpZgpdA/ysyoUVseoViKT9lcNRsXxD0G7vrC0sLh7qS+l8qPy4zhTt3ZPtgirF1468P2WpXVjc34juLMhZlKN8pOMDOMZO4YHeqGkfDfRdGntZ7RrppbWXzY3eTJzt24PHTAFSXvgvQ9ah1MmaRxqlxHcSSRSg7ZIsBSv02ihqnfQNSZ/iH4ZSJ5P7SV0j2biiM2N/3RwOpp8fj7w3LNDHFqUbNOm9MA+hIB9D8rcHniue1n4e2GptK+h3wS/WWFZ3EgyiowOMD+LjvV8fDTw7ZmO4bzY1gAdy0uFZ1DYkb3G9qrlpBqXrb4i+GLuGKWDUkZZpFij+RgWZl3DAx3HNauk+ItL11pxpV2lx9nbbJt7GuSt/h94UNtbQRXjSxO0RhU3AO8xLsXaeuQODiul8O+GbHwzbyW+m+Z5byFwHIO3Jzge1RJQtpuBuZrH1/7mn/9f0f8jWuDxWZrlxp9rawTarMsESTqUdm2gPg4yfzrOO4zTFLXNf8ACfeFvtkNp/b1iZ5/9WolBz+PStYa5pOP+QnZf+BCf40rBoX6Sq0Go2V0xW0u4JyoywilDY+uDVmkMWiiigLCViaqP+Kk0Hk/6+b/ANEtW5WZefZTq2m/aSftHmyfZwOhPlnP/juaqO4jSFLmkFFSAufaikoo1AWikpaAEpaKKBhRRRQAUUUUAFOptOrSmJhRRRWogqvqF0tlptxdPG8iwxs5RBlmwM4AqxUN5B9qs5YPMeLzFK74zhl9wfWgDz2D4o29zbabcWulRTW+oXa2ySR3ikRkruO4bcgjByOtaeleNLjWLCLUdN0Qtp00kiwSvdqjuFyN5THCkrjqTyOKT/hWWkm6huWubozx3a3buNi+a4XaNwC46Z+tPh+G+l281mYLu8SGwklltIA6lYGkBDYyMkckgEnBobphqR+GPH1r4kVv+JcbGSFGN9BPIPNtmHIBXHzAg5DCq83xHsm8OaZq+naa1zHfakmnGF5BE0MjOVywIPcflWpN4C0uaUTiSeO5a1S0mnQqGnjUggPxg9MZrOf4U6P+9W1vb61hfUI9RWCJk2RzJ0KgqePUd6lOncNTtQgZcMq8dqXy1IxtGPTFVdK07+zLVoWu7i8dpGkaW4ILEntwAAPbFXqx2KGeWpOdoz2OKxtY8HaDr9wk+s6XBdyxrtV5FyQPStyikByX/Cr/AAZ/0L9n/wB8Vgax8CfCGq6sl55M9pGqBTb2z7EY56/WvTKKd2KyOK8M+DdC8H+JprfQLIWqS2atId5Ysd57mtzUfEOjaZfR2V/eww3Ui7kib7zDn+eDj1rTaCP7R52xfMK7C+OcdcVzPiDwRpet69aavqF7cxTWwVIkSVVQnJ7EdTnFXFxcveCwknjTTToulapaWzzWep3S2yu48spnPzEEdOKZdeI/BV/NYXdxqdjM9tcFbZ9+QkhAB/RhyeOR61PN4F0+Xw/p2jNc3P2WwmEseWXLYz8p46cnpWVJ8I9Gm0uxsHvr/wAmwbMW1kBPTbuwvzYCgAmtF7PuLU138aeH31K0soLpbme7na3j8mMsAyjJycVU1nxxaaJqGs20umzu2kWMd7IybcSK7FRtxyMY5JpbD4daTpupxajDc3XnRXTXQJdQpZl2n5QMc1Nf+CtO1vUtS1CS9nP9pWqWsgiZdqrG25ccdc5znrml7lw1KunfEjw3dafbXeoXkNhJOCY0kO4Mu7buVgMFSeh4rZ0/xNoWp3UFrpmo29xLNH5yRx8kp69OO/Wuel+FGjmNAl7eQogyQhQAnzPMzjGB83YcVb8PfD7SNG1Gx1Oyu7ieW0hkiicuuHVzk7io+YZPHpTl7JrQNSzb+O/DM7yb75ITHcvagzoV3Ohw2M9gTjNSXnjDT9N8RXGm6lstYorVLj7XJINrBmKhcdc8Vm3fwu0S5kd3mu18yeWZ1DjBEjBnTp0yoPr71NrPgHSPE2oG/lu51dUijjMLKRGYm3KRkHnkgg0L2dw1Llr4t0nUhqo0Yi7bS41aQqu1HDJvG18YIII5rkb74laTqPhuWTVtBcn7ImoR2rzKfNi34yGA4IPY12Vl4QstP/tb7LPOn9qKizD5dq7YwmVGOOBWIvwm0f8AsmSxkvLyQtarZrM7LujhDbtq8Y5PenGVNBqU7Txxa6dZaxFo/h+N7XQ40lmaC7XbtdDISDt68YPvWpZ+NTcJob3GhzQDWmHkN5qOoBTeCTxzjjGPxqYfD+yEeur9tuca5AkFzgKNqqu0FcDg4PvVk+DLbydBiS9uVXQwBb42/Phdo3cenpihypsLMt+F9ei8RaXJewW0lsq3EkJSQgnKMVJ447Vp3ih7OYMMgxsCD34rP8OeH4fDeny2ltPLOkk7zky4yGc5PQDjJrUkTepB6EYPvWEmubQZ5WPgf4O1vSYLkWk1ncyoWaW3mIyx74ORXQab8JfB1hplvavo8Ny0KBTNOMvIfUn1rs4okhiWOJVRFGAFGAKkocrvQLI5aD4b+EbW5juLfQrRJYmDowXlSOhrqBwKWipGJjNcvP8ADbwjc3Ek8+hWjyyMWdivJJ6mupopgcZefCnwdc2csC6JbxGRCvmRjDLnuD61zQ+Bvg7Q9FurlrWa9uIYWdJbmUnDBTg4GBXq9MliSaF4pFDo6lWU9CPShSaFYis1AsYMcDy1wPwFch430/xNe6rZf2CZWs/JlW5jWUIpJU7T1BznHHIrtUUKoA4A6AU7tVRlyyugPDIZfFX9rPoguNThvILLybeKFcQmf7KMKXB2gBstk9zjNag0n4lx2NrHE10zxXgdne8jJMWEyDzzzvr1zyl37sDdjG7HOKeBitfbdkTynmUPh/xNY/Cu+0q1sc3t1eTCaITKHNtLId5Rs4D7DxnoasfD/RfEmlaHqOm69ZGJUiKW5SVCs5IPzkDJDnjdk4z0r0WjFT7XS1irHjml6F8Q7Dw9a6esM1sI50DvbXCFhAQeFBbAZWwT61Hrh8b6WGOsX18TcavHbxC1lRVmiJOChBypxwc4HFez01o1b7wBx0BGar2zb2FynAeE9O8aW3iCOTxFI81l9hCuGmU7ZM8YA6nHUkde9VvBHhjxDp3iWC91qGVYVsJYcfaAVRzOzD5QecoRzXpVFS6r10HY8hs/C/jTTZs6VFLbia8mlcm4U9ZQQz85YbMgDsa2E8NeIrn4Z63Z6q9zearfLIiwT3IKou75dhHAO3nr1HNejUUOq30FY8Rtfhx4rjkst3zYkbE7yKrxgT7w7gH7zL121dh0r4mCzuBI10JRPCYg10hWRRneCQcqDxz7dK9hoxVOu3ug5UNj3eWN4w2ORnvXOeNtGsNd0u0sNVgWe3mvI1ZCSOMHuK6WmuivjcAcHIyM4rBOzuM8vb4A+DxqkN3bx3UUccokNt5u6NwP4cHkD8a6YfC/wYc/8U/Z/wDfFdYMCim2FkYmj+DtB8P3Ek+jaZBZyyrsd41wSPStvFLRUjCiiigArD1XA8SaB/13n/8ARLVuVGYlaRWIBKnIJHTtx6U07MB4paQdaWkAUUUUAFFFFABRRRQAUUUUAFFFFABTqbTq0piYUUUVqIKQ0tBpPYBtFFFc5QUlLRQAUUUUAFFFFABRRRQAh715n8QtM8Tap4isU06CebTonglQRMoUSLJly+SDjbjGK9Npu2rhLldxM8pjsfHt5JY3F29wJ4LqYmMlVRT5bBG4PzJuxUunJ48m/sz+0mvY4pUcz7DGHil+XCtzzGcNg9eeleo7RRtHpWntn2FY84OieIj8PdGtD9sGoQagkl2vnDe0e8luc8jGOKwtP07x9omn3sGnQXKwM6yLEWQlc3DF/L56+WVPNeybRRihVmugWOD8RxeLfs2ix6a0058tlvwoVN+V6k54PtXC2+u+IbPUotDfUprO5t7QxxwIqhDP5LFYy2cA7sHJ+le67fWvJfAHgXwx4j0/Vb/XdGtr26/tW4UzSqSxAc45zW9GUXCUp9BNMrSXvj2HSYo7e5eW5W6DF3uYeU8tdwPPTdursfAOdM0q9TVJIbeWW+llVWnQ5VjkHg0p+FvgEOEPhvTw55C7efyzSr8K/AbZ2+GtPOODhTx+tKU6Ulb9Aszqf7Ssf+f22/7+r/jR/aNj/wA/tv8A9/V/xrl/+FVeBP8AoWbH/vg/40f8Kp8C/wDQsWGf9w/41laj3Y9TqP7Rsf8An9t/+/q/40f2jY/8/tv/AN/V/wAa5f8A4VT4F/6Fmw/74P8AjSD4WeA2zt8N6e2ODhScfrRaj5hqdT/aNl/z+W//AH9X/Gj+0rL/AJ/Lf/v6v+Ncv/wqnwL/ANCzY/8AfB/xpD8LPASD5/Denr9VI/rRal3YanU/2lY/8/tv/wB/V/xo/tKy/wCf23/7/L/jXL/8Kq8CHp4ZsP8Avg/40o+FPgQ/8yxY/wDfB/xpWo92Gp0/9o2X/P5b/wDf1f8AGj+0rL/n9t/+/q/41zH/AAqjwL/0LFh/3wf8aP8AhVHgX/oWLD/vg/40Wo92Gp0/9pWX/P7b/wDf5f8AGj+0rL/n9t/+/wAv+Ncx/wAKo8C/9CxYf98H/Gj/AIVR4F/6Fiw/74P+NFqPdi1On/tKy/5/bf8A7/L/AI0f2jZf8/tv/wB/V/xrmP8AhVHgX/oWLD/vg/40f8Ko8C/9CxYf98H/ABotR7sNTp/7Ssv+f23/AO/q/wCNJ/aNl/z+2/8A39X/ABrmf+FUeBf+hYsP++D/AI0f8Ko8C/8AQsWP/fB/xotR7sNTp/7Ssf8An8t/+/q/40f2lY/8/tv/AN/l/wAa5n/hVHgX/oWbH/vg/wCNH/CqPAv/AELFj/3wf8aLUe7HqdN/aVj/AM/lv/3+X/Gj+0rH/n8t/wDv6v8AjXM/8Ko8Cf8AQsWP/fB/xo/4VR4E/wChYsf++D/jRaj3YanTf2jZf8/lv/39X/Gj+0bL/n8t/wDv6v8AjXMf8Ko8Cf8AQsWP/fJ/xpf+FUeBf+hYsf8Avk/407Ue7DU6b+0bL/n8t/8Av6v+NH9o2P8Az+W//f1f8a5n/hVHgX/oWLH/AL5P+NJ/wqfwJ/0LFj/3yf8AGi1Huw1On/tGx/5/Lf8A7+r/AI0f2lY/8/lv/wB/V/xrmP8AhU/gT/oWLH/vk/40f8Kn8Cf9CxY/98H/ABotR7sNTp/7Ssf+f22/7+r/AI0f2lZf8/tv/wB/l/xrmP8AhVHgX/oWLD/vg/40v/CqPAv/AELFj/3wf8aLUe7DU6b+0rL/AJ/bf/v8v+NH9pWX/P7b/wDf1f8AGuY/4VR4F/6Fiw/74P8AjR/wqjwL/wBCxYf98H/Glaj3YtTp/wC0rL/n9t/+/wAv+NH9pWX/AD+W/wD39X/GuY/4VR4F/wChYsP++D/jS/8ACp/An/QsWP8A3wf8aLUe7DU6db+0kcJHcwux6KsgJP4Zqx6V5P4w8F+HfDOseD7vQNJt7C4k8QW8TSQgglCGJX6cCvVxRUpxjFSi9xpjqKKKwKCiiigAooooAKKKKACiiigAooooAKKKKACiiigAp1Np1aUxMKKKK1EFBooNJgNooornKCiiigAooooAKKKKACiiigAooooAKKKKACiiigBK4L4Tf8i/qv8A2F7n/wBDNd7XB/CUZ8P6r/2F7r/0M100/wCDP5EvcXxBaXcPxO0jWINLuLu2tbCdJJIlB+c42jr7GuW1FPHkc19Lo9re2vnXM0wWNEO75VKA598ivZMe9GKzVW3QLHlOoTfESVdVeEXEciXaC3ijjXbJFkEEN24yD71v603ipvEumx2Zmi0xrXdO8KK7CTupz7dD612496OKftVvYLHiV1rHji1h0rTrubUI9TuZrxFARM3ASMNCwHQDOM/jVn7J470+ad9LsLiOWfUBPcFNuxxsQNjPYndXsD28UkqSPGrPHnYxXJXPoe1Pxiq9suwWPIkn+IqyanmK+cSIfs6lUGw+fgYP/XM5qvNpnji6jW5v7e7nna1tFMRKlPMWU+YSvrjBzXso470uKXtl2Cx5DI/xGe3dT9sQmcBmRU3D5X3bf9n7mK9J8MPqEnhXTH1pWTUWtk+1KwwRJj5v1rUxS9KiVTmWw0gopC2KXNZjCjFH+elH+elMAxRij/PSj/PSgAxRiikB9KQC4oxS0UAJijFLRQAlFLRQAlFMknjhQvK6oo6ljgD8ah/tSw/5/bb/AL/L/jRdAWcUYqt/alh/z+23/f5f8aP7UsP+f22/7/L/AI0roCzijFVv7UsP+f22/wC/y/40f2pYf8/tt/3+X/GndAWcUYqumo2cjhI7uB2PQLKpJqcODnFAC4pRRQOlNAcJ8TR/pfgz/sZLb/0F67rvXC/E3/j88Gf9jJbf+gvXdd66Kn8KHzJW7FooormKCiiigAooooAKKKKACiiigAooooAKKKKACiiigAp1Np1aUxMKKKK1EFBooNJgNooornKCiiigAooooAKKKKACiiigAooooAKKKKACiiigBK4P4Sf8i/qv/YXuf/QzXeelcH8JP+Rf1X/sL3P/AKGa6af8GfyJe53tJS0VzFCUUtFABRRRQAlFLRQAUUUlAGD4zg1u58K3sXhaVYdUaPEDsQMHvgnjOOleEnwH8ZTydV1LJ/6izf8AxVfQeu6hNpWi3V9a232qWCMusG7b5nsDXFp8XrCV9Nkjs3+yXVjNd3Eu7m3aJdzx47sB/MVrCLa0RDseYf8ACBfGX/oKal/4Nm/+Ko/4QL4yf9BTUv8AwbN/8VXrN7481Sw8Ir4juNET7HLAs6Ktx8wDEbQeOpBzW/Jr08OnaldmxaYWcAmSKFtzzfJu2gevanZroKyPB/8AhAvjJ/0FNS/8Gzf/ABVH/CBfGT/oKal/4Nm/+Kr1bTvilYXcNtcztbx2kxk3TLIx2hFBIK4yGBOCDV9fid4ZaSBftkoM77FzbvwdwTnjj5iBn3p8suwWR40PAnxmRgy6pqOVORnVSf0LV7v4Mg1u38J2UXimYTaoqfv3BByc+3HSsu9+I2lx3S22n5u51vobSdCCnl+YxUNyORlT+VdiBUSulqilYKWiisygooooAKQ9KWkNAHEeOLW9mmgaNXktwuMICQG9xXJ/YZ/+fST/AL9H/CvYWGPu9a89s/ikZvJN1pXkrdm7jtmWXdult8llbjgEAkGp9g56oVzB+xT/APPpJ/36P+FH2Kf/AJ9ZP+/Rre0j4oS67dQW+m6UryS6at+26bAQE8r06itTS/G13qHgm68SNpD+VFAZoYIX3vLjORjHXih4VoLo437FP/z6yf8Afo/4UfYp/wDn1k/79Gumsfihp1ylvPcSW62kqSv9ojdm4Tb/AA4yDlsFTzV6P4l+Gpbi1hW9kD3ThI90DgZLbBk44+bil9VkugXRxX2K4BG21lz7RmvTfDkV1FosCX27zQv8RyQOwNYsvxF0uW9tbbSybt5NQjspwQUMRcMQ2COR8prsAKpUnT3HcWgdKKB0qkBwnxN/4/PBn/YyW3/oL13XeuF+Jv8Ax+eDP+xktv8A0F67rvW9X+FAmO7FooornKCiiigAooooAKKKKACiiigAooooAKKKKACiiigAp1Np1aUxMKKKK1EFBooPSkwG0UUVzlBRRRQAUUUUAFFFFABRRRQAUUUUAFFFFABRRRQAlcH8JP8AkX9V/wCwvdf+hmu8rg/hJ/yL+q/9he6/9DNdNP8Agz+RL3O9ooormKCiiigAooooAKKKKACiiigCrf2K6haNbvLLErEEtEQG4Oe4Nc+fh14f+2QTpbyIsH2jEKsPLfz/APW7hjnd09u2K6qkqlJrYRzSeBNJGgSaLNJeXGnNH5UcEs5IhTOQFPXjAwTkir0Phy2i0mewa5u5RcLtkneX96eABhgBjAAxgVr0UczYHD6r8MrC6tbh7O6nTUZfMYXMrAhndQpLKoAPygDp+Zqvp3wutmsYI9ev5rmeD5Y2twsShA4cAgKMncoOetegYoxV+1na1xWRx8fwx8Pw373sRvVnknS4djcltzo7OpO7PQsa7CgilqJSctxqwUUUVIwooooAKKKKAGsuVIzjjGR2rk7P4a6FZZKteSsqziJpZ93k+d/rSoxgFvUgnsK62iqUmthHL6b8P9I0m7iuLOW7EkVl9gTdKCBD2HTr71dsvCtjp/hj+wrWW6S0ClVYS4kTnPDAetbdFHNJ7gcJrHwwsLmxnOnXU0OoS+YTcSkFXaTG5mUKBnCgcCk0/wCGNoYLR9bvZrm8tdojkgCxKFR96DAUZwe/eu8wKMCr9rK1rhZHHWXwv8O6ffC7tftizC5S6Ja5L7pE3bSd2f7xrsqTFLUSk5bjCgdKKKSA4T4m/wDH34M/7GS2/wDQXruu9cJ8Tv8Aj88F/wDYyW3/AKC9d33rer/CgSt2LRRRXOUFFFFABRRRQAUUUUAFFFFABRRRQAUUUUAFFFFABTqbTq0piYUUUVqIKQ9KWg0mA2ijBowax5WUFFGDRg0crAKKMGjBo5WAUUYNGDRysAoowaMGjlYBRRg0YNHKwCijBowaOVgFFGDRg0crAbXl/wANPFGgaTpWq2uqa5ptlcDVbljFc3aRsAXODgkGvUGQlSPWsebwb4bup3nuvD+mTTSHc8j2iFmPqTitqUkouMupLIv+E78I/wDQ1aL/AODCL/4qj/hO/CP/AENWi/8Agwi/+Kp3/CC+Ff8AoWtJ/wDAKP8Awo/4Qbwr/wBC1pP/AIBR/wCFPlpeYajf+E78If8AQ1aL/wCDCL/4qj/hO/CH/Q1aL/4MIv8A4qnf8IN4V/6FrSf/AADj/wAKP+EF8K/9C1pP/gHH/hRy0vMNRv8AwnfhD/oatF/8GEX/AMVR/wAJ34Q/6GrRf/BhF/8AFU7/AIQXwr/0LWk/+Acf+FH/AAg3hX/oWtJ/8A4/8KOWl5hqN/4Tvwh/0NWi/wDgwi/+Ko/4Tvwh/wBDVov/AIMIv/iqd/wg3hX/AKFrSf8AwDj/AMKP+EF8K/8AQtaT/wCAcf8AhRy0vMNRv/Cd+EP+hq0X/wAGEX/xVH/Cd+Ef+hp0X/wYRf8AxVO/4QXwr/0LWk/+Acf+FH/CC+Ff+ha0n/wDj/wo5aXmGo3/AITvwj/0NWi/+DCL/wCKpP8AhO/CP/Q06L/4MIv/AIqn/wDCC+Ff+ha0n/wDj/wo/wCEF8K/9C1pP/gHH/hRy0vMNRv/AAnnhH/oadF/8GEX/wAVSf8ACeeEf+hp0X/wYRf/ABVP/wCEF8K/9C1pP/gHH/hR/wAIN4V/6FrSf/AKP/CjlpeYajP+E78I/wDQ06L/AODCL/4qj/hO/CP/AENOi/8Agwi/+Kp//CDeFf8AoWtJ/wDAKP8Awo/4QXwr/wBC1pP/AIBR/wCFHLS8w1Gf8J34R/6GnRf/AAYRf/FUv/Cd+Ef+hq0X/wAGEX/xVO/4QXwr/wBC1pP/AIBR/wCFJ/wg3hX/AKFrSf8AwCj/AMKOWl5hqJ/wnfhD/oatF/8ABhF/8VR/wnfhD/oatF/8GEX/AMVS/wDCDeFf+ha0n/wCj/wo/wCEG8K/9C1pP/gFH/hRy0vMNRP+E78If9DVov8A4MIv/iqP+E78If8AQ1aL/wCDCL/4ql/4Qbwr/wBC1pP/AIBR/wCFH/CDeFf+ha0n/wAAo/8ACjlpeYaif8J34Q/6GrRf/BhF/wDFUf8ACd+EP+hq0X/wYRf/ABVL/wAIN4V/6FrSf/AKP/Cj/hBvCv8A0LWk/wDgFH/hRy0vMNRP+E78If8AQ1aL/wCDCL/4qk/4Tvwj/wBDTov/AIMIv/iqd/wg3hX/AKFrSf8AwDj/AMKX/hBvCv8A0LWk/wDgFH/hRy0vMNRn/Cd+Ef8AoadF/wDBhF/8VR/wnfhH/oadF/8ABhF/8VT/APhBfCv/AELWk/8AgFH/AIUf8IN4V/6FrSf/AACj/wAKOWj5hqM/4Tvwj/0NWi/+DCL/AOKo/wCE78I/9DVov/gwi/8Aiqf/AMIN4V/6FrSf/AOP/Ck/4Qbwr/0LWk/+AUf+FHLS8w1G/wDCd+EP+hq0X/wYRf8AxVL/AMJ34Q/6GrRf/BhF/wDFUv8Awg3hX/oWtJ/8Ao/8KX/hBvCv/QtaT/4BR/4UctLzDUb/AMJ34Q/6GrRf/BhF/wDFUf8ACd+Ee3irRf8AwYRf/FU7/hBfCv8A0LWk/wDgHH/hSf8ACDeFf+ha0n/wCj/wo5aXmGpxvjzxLoes6p4Nt9I1nT7+ZfEVs7R2t0kjBcOM4UnjmvTxWPbeD/Dtlcx3NjoWm208ZyksVqisp9iBxWwARSqyTiox2QLzFoowaMGsOVlBRRg0YNPlYBRRg0YNHKwCijBowaOVgFFGDRg0crAKKMGjBo5WAUUYNGDRysAoowaMGjlYBTqbg06rgmhMKKKK0EFFFFABRRRQAUUUUAFFFFABRRRQAUUUUAFFFFABRRRQAUUUUAFJRRQAUCiigBaKKKACiiigAooooAKO9FFABRRRQAUlFFIAooopgFLRRQAUUUUAFFFFABRRRQAhooooADRRRQAUUUUAFAoooAKWiigAooooAKKKKACiiigAooooAKKKKACiiigAooooAKKKKACiiigAoFFFABRRRQB//9k=)

* MCU thiết lập chân DATA là Output, kéo chân DATA xuống 0 trong khoảng thời gian >18ms. Khi đó DHT11 sẽ hiểu MCU muốn đo giá trị nhiệt độ và độ ẩm. MCU đưa chân DATA lên 1, sau đó thiết lập lại là chân đầu vào.
* Sau khoảng 20-40us, DHT11 sẽ kéo chân DATA xuống thấp. Nếu >40us mà chân DATA ko được kéo xuống thấp nghĩa là ko giao tiếp được với DHT11.
* Chân DATA sẽ ở mức thấp 80us sau đó nó được DHT11 kéo lên cao trong 80us. Bằng việc giám sát chân DATA, MCU có thể biết được có giao tiếp được với DHT11 ko. Nếu tín hiệu đo được DHT11 lên cao, khi đó hoàn thiện quá trình giao tiếp của MCU với DHT.

- Bước 2: đọc giá trị trên DHT11

* DHT11 sẽ trả giá trị nhiệt độ và độ ẩm về dưới dạng 5 byte. Trong đó:

Byte 1: giá trị phần nguyên của độ ẩm (RH%)

Byte 2: giá trị phần thập phân của độ ẩm (RH%)

Byte 3: giá trị phần nguyên của nhiệt độ (TC)

Byte 4 : giá trị phần thập phân của nhiệt độ (TC)

Byte 5 : kiểm tra tổng.

Nếu Byte 5 = (8 bit) (Byte1 +Byte2 +Byte3 + Byte4) thì giá trị độ ẩm và nhiệt độ là chính xác, nếu sai thì kết quả đo không có nghĩa.

* Đọc dữ liệu:

Sau khi giao tiếp được với DHT11, DHT11 sẽ gửi liên tiếp 40 bit 0 hoặc 1 về MCU, tương ứng chia thành 5 byte kết quả của nhiệt độ và độ ẩm.

Bit 0 :

![Diagram

Description automatically generated](data:image/jpeg;base64,/9j/4AAQSkZJRgABAQEAeAB4AAD/4RDcRXhpZgAATU0AKgAAAAgABAE7AAIAAAAGAAAISodpAAQAAAABAAAIUJydAAEAAAAMAAAQyOocAAcAAAgMAAAAPgAAAAAc6gAAAAgAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAGFkbWluAAAFkAMAAgAAABQAABCekAQAAgAAABQAABCykpEAAgAAAAM0OAAAkpIAAgAAAAM0OAAA6hwABwAACAwAAAiSAAAAABzqAAAACAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAMjAyMjowMTowOCAxMDoyNjo0MgAyMDIyOjAxOjA4IDEwOjI2OjQyAAAAYQBkAG0AaQBuAAAA/+ELGGh0dHA6Ly9ucy5hZG9iZS5jb20veGFwLzEuMC8APD94cGFja2V0IGJlZ2luPSfvu78nIGlkPSdXNU0wTXBDZWhpSHpyZVN6TlRjemtjOWQnPz4NCjx4OnhtcG1ldGEgeG1sbnM6eD0iYWRvYmU6bnM6bWV0YS8iPjxyZGY6UkRGIHhtbG5zOnJkZj0iaHR0cDovL3d3dy53My5vcmcvMTk5OS8wMi8yMi1yZGYtc3ludGF4LW5zIyI+PHJkZjpEZXNjcmlwdGlvbiByZGY6YWJvdXQ9InV1aWQ6ZmFmNWJkZDUtYmEzZC0xMWRhLWFkMzEtZDMzZDc1MTgyZjFiIiB4bWxuczpkYz0iaHR0cDovL3B1cmwub3JnL2RjL2VsZW1lbnRzLzEuMS8iLz48cmRmOkRlc2NyaXB0aW9uIHJkZjphYm91dD0idXVpZDpmYWY1YmRkNS1iYTNkLTExZGEtYWQzMS1kMzNkNzUxODJmMWIiIHhtbG5zOnhtcD0iaHR0cDovL25zLmFkb2JlLmNvbS94YXAvMS4wLyI+PHhtcDpDcmVhdGVEYXRlPjIwMjItMDEtMDhUMTA6MjY6NDIuNDgyPC94bXA6Q3JlYXRlRGF0ZT48L3JkZjpEZXNjcmlwdGlvbj48cmRmOkRlc2NyaXB0aW9uIHJkZjphYm91dD0idXVpZDpmYWY1YmRkNS1iYTNkLTExZGEtYWQzMS1kMzNkNzUxODJmMWIiIHhtbG5zOmRjPSJodHRwOi8vcHVybC5vcmcvZGMvZWxlbWVudHMvMS4xLyI+PGRjOmNyZWF0b3I+PHJkZjpTZXEgeG1sbnM6cmRmPSJodHRwOi8vd3d3LnczLm9yZy8xOTk5LzAyLzIyLXJkZi1zeW50YXgtbnMjIj48cmRmOmxpPmFkbWluPC9yZGY6bGk+PC9yZGY6U2VxPg0KCQkJPC9kYzpjcmVhdG9yPjwvcmRmOkRlc2NyaXB0aW9uPjwvcmRmOlJERj48L3g6eG1wbWV0YT4NCiAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAKICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgIAogICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgCiAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAKICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgIAogICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgCiAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAKICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgIAogICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgCiAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAKICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgIAogICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgCiAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAKICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgIAogICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgCiAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAKICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgIAogICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgCiAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAKICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgIAogICAgICAgICAgICAgICAgICAgICAgICAgICAgPD94cGFja2V0IGVuZD0ndyc/Pv/bAEMABwUFBgUEBwYFBggHBwgKEQsKCQkKFQ8QDBEYFRoZGBUYFxseJyEbHSUdFxgiLiIlKCkrLCsaIC8zLyoyJyorKv/bAEMBBwgICgkKFAsLFCocGBwqKioqKioqKioqKioqKioqKioqKioqKioqKioqKioqKioqKioqKioqKioqKioqKioqKv/AABEIASwCEQMBIgACEQEDEQH/xAAfAAABBQEBAQEBAQAAAAAAAAAAAQIDBAUGBwgJCgv/xAC1EAACAQMDAgQDBQUEBAAAAX0BAgMABBEFEiExQQYTUWEHInEUMoGRoQgjQrHBFVLR8CQzYnKCCQoWFxgZGiUmJygpKjQ1Njc4OTpDREVGR0hJSlNUVVZXWFlaY2RlZmdoaWpzdHV2d3h5eoOEhYaHiImKkpOUlZaXmJmaoqOkpaanqKmqsrO0tba3uLm6wsPExcbHyMnK0tPU1dbX2Nna4eLj5OXm5+jp6vHy8/T19vf4+fr/xAAfAQADAQEBAQEBAQEBAAAAAAAAAQIDBAUGBwgJCgv/xAC1EQACAQIEBAMEBwUEBAABAncAAQIDEQQFITEGEkFRB2FxEyIygQgUQpGhscEJIzNS8BVictEKFiQ04SXxFxgZGiYnKCkqNTY3ODk6Q0RFRkdISUpTVFVWV1hZWmNkZWZnaGlqc3R1dnd4eXqCg4SFhoeIiYqSk5SVlpeYmZqio6Slpqeoqaqys7S1tre4ubrCw8TFxsfIycrS09TV1tfY2dri4+Tl5ufo6ery8/T19vf4+fr/2gAMAwEAAhEDEQA/APpGiiigAooooAKKKKACiiigAooooAKKKKACiiigAooooAKKKKACiiigAooooAKKKKACiiigAooooAKKKKACiiigAooooAKKKKACiiigAooooAKKKKACiiigAooooAKKKKACiiigAooooAKKKKACiiigAooooAKKKKACiiigAooooAKKKKACiiigAoNFIaTegBmjNJRWXOx2FzRmkop87CwuaM0lFHOwsLmjNJRRzsLC5ozSUUc7CwuaM0lFHOwsLmjNJTS2KOd3AfmjNVbG9g1C1W5tWLRMSASMZwcVZo52AuaM0lFHOwsLmjNJRRzsLC5ozSUUc7CwuaM0lMeTbjgn6Uc7AkyKCcUwHK5FUtK1WLWNPN1bqyp5skWH65Rip/UU+Z2AZrviPSvDWmm/1y8S0tlYKZGUnk9sAEmoZPFmiR6Raam2oxmzvCFt5FVm80noAAMk+2K5/wCKN5DaeD51aEy3VwPJgYQGUx7uGfaPRSa4C5Sew0TSb7Qob20s7XTJodKjlj+cXYbAYqc5LDOAR3rWC5o3Yme2XOqWdnpr391OIrWNPMeRwRhfXHWsm18e+GbzRU1a21eGSykm+zpIqtkyZxt24zn8K52DUPFNnorX/jGLT59OitRI9vDE5uGfjAI6Z3eleazWVtP8PreLS9Ou0f8AttZ7nU5omj+zSMrHzRGP4VG1eeOaqMU9xH0DpesWOs6el7plytxbyZ2yKCM446HmrfmKBya+bVl8UaJ4f0tBbXllHNY3RP2VXxLKSCjkYyGPWtvwXqfiK48deGnu7+6u7aS1WK5tZdymBxAWMnowzwc9D+FDh2YXPeAwpdwqNOn406ubndyh24UbhSUUe0YC7hRkUlJR7RgOzRuFUtV1GPSdIutQnVmitYmlcJ1IAzxVrJBp8zAfuBozTAQSadS52AuaM0lFPnYWFzRmkoo52Fhc0ZpKKOdhYXNGaSijnYWFzRmkoo52Fhc0ZpKKOdhYXNGaSijnYWFzRmkopc7Cw6ikFLWq1QgooopgFFFFABRRRQAUhpaQ1L2ASiiisCgooooAKKKKACiiigAooooAKKKKAENIRux2pTTGbZg01uBjeDf+RXtvq/8A6Ga3azdCsf7M0iO0Ehk2FvmIx1JPT8a0qJbgFFFFIApKWk7UAU7++aysZpxBJMY0ZhGnJbA6D3rzT/hdV7/0I2uf9+T/AIV6rsU9qdRcR5QfjVe/9CNrn/fk/wCFc54x+OGtxWEX9m6BdaRKX5lv4SQw9AOK96qhquiaZrkCw6xYQXkStuVZkDAH1qk0JpnhmlfH7xDcXMUbeHPtUKFfOa3DM2Py4NeqfDe9N74KhuGiaAzTzyeW/wB5d0rHB+mcV0dvptlZgi0tYYcgA+WgWqOg6X/Y9h9lMvnAzSSbtmPvOzY6n1ptpx0BJmm+wuN4B9M0392UXdtxngehrl/iXa6gfCZv9Dimm1DT54547eA4acBwGT6EE/lXH+JtH13TrZlX7XOsumytbi3R28u+Zgy4AzjAyATwAOtXCN1uDO/t/FujXuoapYrcbJdKYLdmZdqqSM9T1rXzEYwfkKnkDA5r52ufDviO70jxil5pl7Jf3H2Zx+6b98QF3FT0Y9elbOsReJT49tnsNO1iG0gvbPMpGUSLZhguDgLk8jn8K0dJW0YuY9yxH0O0+2M0KkZIZVUe4FfO2i315fX1/Bp/ieWTWYI7tIoGSUSXT5+U5PygrggcnrXd/De38XzaG9xNcSWssgRXh1O1b5GUYYqN2Tk8k980pUuVbjTudzonivTNeuNRt9OeRn06c29xvQrhwcHHr0rZ80DqR+dfOWoWvi2xudXewstQHn6673DW9tIFkiII3gfxLnmtHxPZ+Io9JlgibWLy5j0mPyZEtpQWm87OTgEBtnvTdGL6iue+CUdCQD6ZrIvPFml2M1sks+/7RcfZkMQ3gSf3SR0ryLVNQhn+LT2Go689qy3lo6RzLJynkrmEADADFskkjntUdnol9aeHzaTaTfrJ/wAJIZm2QOcxZbDDGflwRzQqMVuwuz3pH3jI/SnVxXwr+2J4MEGpJdRzx3U/y3UbK2wyNt+8ORiu1rnlFRdiuhzvjqcx+BdaGxm/0KX7o/2TXjuvfH/xBEZUtNANisgxA90jBl46kcA817prumjV9AvtP3+X9pgeLfjO3IxnFE2n2d8At7axXC4K/vEDcfjVXSWommzxjwh8cNbn0t/7T8P3erTq/M9hDhQPQjnmuh/4XVe/9CNrf/fo/wCFej6Xoum6LbmDSLKCziY7ikKBQT68VfqXJN3DU8oHxqvSwH/CDa516+Uf8K9NtLprq3ilMTR+YgYo3VcjoferWM0mxcg4GRSeo0KKWkpaQwooooAKKKKACiiigAooooAKKKKACiiigBRS0gpa6I7EhRRRTAKKKKACiiigApDS0jdKmWwCUUmaM1gULRSZozQAtFFFABRRRQAUUlGcdaAFopMg9KM0AFIfvAUZz0pCwByTgetJbiMfwlLJP4at5JnaRyXyznJPzGtqsXwjG8Phm2SVGRwXyGGCPmNbdXLcYUUUZqQCikpaACikzRQAtFJRQAjVz/guaW48P+ZcSNK/2q4G523HAmYAZPtXQP0/Cue8FK0Ph8xyqyP9quG2sMcGZiDTWwjoC6p95lXPqaRJInx5bIwPIwc5rkviFZ3d9Z6WmnxzOy6hGZvJ6iLndn2rgfDul+LLO3th5F7DcR6ldKu5uFtin7v8N1bQp3juK57X5kZ3fMpCfe5Hy/WmyyQGLbLJHsdSOWGCK8etNL8Uw+CZnng1WXV7gKtzACirI+/lic85Xr7VjSaB4xn8F+GLa/s75r631OUXYLDK2xLYBIPT7tWqXmK561pXg3Q9FvYrmyV1KlmiR52ZFLckqpOK19V1CHS9Pku5wxjjG4hBlj9BXkFnpHjJ7TwpdSi7lls8Q3dpIcfKXHz7s9VA/Kun8cafrt54w0uSC2ubvREtZxLFbsBiYoQhOSM9aTppu1x3O50zVLXU9Ltr+1kBgukEkRY4JBGakW7t3nliSeNni++ocfL9fSvDdY0Txp/Y2g2mk6fqCGzsrfzArqFRww3ADPDY61t3PhzWLW18X3Nvpl495fTI9q0EihnUqoIznjvmn7JdxXO+uPC+itqE2tSo/mO63Em2U+WzKAAxXoeFFVbT4haBdzJFDdld9tJdbnUqojQ4Y5rP+Ftlrtn4SnsvFEM0c6XLiJZ8H92eQBgnjrS+MfAdpd+ENQi0SyVNQ+xyQW5U4JDNuKfiamyUuWTGXB8SfDo0e51L7WfJtWiWYbTuXzWxGcehzx7Vr6D4ksPEdvcTaXIZEtp2t5CRjDr1FeafD7wFdyajrf8Awk+mOtjc2WnRJHKRh5IVJbof4WAr1PS9GsNFimj0+3WBZ5mmkC/xO3U0qijHRAir4wllg8E6xLBI8cqWcjK6MVKnaeQe1bIUDoMVj+MIpJ/BOsRQozyPZyKqqMknb0Fa6yKzHaay6DHiik6UZqbjFpG6UUh6UAYeueKrHQbi2trnzJbq6z5UMK7mYAcnFS2HiPTtQFqEuFimuYzIkEh2vgdflrlvHnhlvEerW3+iXUMttEz2uqWbDfBJnpgnoRXLW/hDXk8XWWr6npUl48WgSwtPG6qxucnZ34Yjv6muiNOLjuTc9iW9tTGzC6h2ocMRIMKfQ1Ru/Eel2l7Z2s19CJbxzHCocHcQORXiEPg3xOPBmv2Q0G7iuL6G2kjj3p/rVZt2DuznBHJrfu/h49r4p8F3WnaG0lvbDfqDKwOyQqDuOT/e9KHSit2F2ep3Guafaaxa6XcXccd5dqzRQs3zMAMk4q9HcQzEiGWOQqcEKwOPrXkvjrwjrOp/GXTNb0/TXntYNKkh+0KwAinzJsJyc8ZU1H8KfDXinRvEMcur2s9tbvpwF20jgiW43k54J5xjmk4R5bphc9Rj1zTJb6a0jvoDNAQJF8wZUmrZvrVcbrqEc7RmQDn0rwDWvh1rom8VvZ6JO1zdanHPZTxuozFn5gDurb+JHgXUJbazg8KaNNMGikmllVxlZztx95hycHmq9jHa4XZ7K13bq4R7iIOSAFLgHJ6UNe2qOyPcwq6/eUyAEfWvG7/wlrV5r1zfvpdw0kaaa1tIWHEkbDzT17Ac1i+IfBviu48Ya/PZ6PNd2moJPJFcu6h0k5CqpzypwCPTNCpR7hzM98F/ZkgC7gJJwMSDk+lYlj410e9nvYhdCE2d2LRmm+UPIR0UnrXg3/CvPF8U2pSW+jXYw9tJaYkXhhjeR81a7eAfEE11KbnRJ5rdfE8F4kTOvNsFYMRlunI4603Riuors+hQQQCDnPpS1BAgSJFRDGoUAKe3tU9cvUsUUtIOlLXQtiQooopgFFFFABRRRQACmvwtOpjjIqZbAczrnjK30HXtP068sp9l+xSO73KIkYAnaxJyDxxxU9/4stdOk1I3kEqW2mwiae5BBUA/w465rM+JXhWfxR4HvNP0/C34KS20h4Kurg8HtxkfjUOp+F7zVPhtfaO0iDU76BmlkJ4MhOcZ9Bwv0FTHkcUM2IvE8kumwX39jXwinKbF+QuFYjDkBunOT3x2psfi+2uvFNzoOn2lxdXNmivcyrtEUO4ZUFic5I9AaztA1fUfslnp93od3DcwqkLOceVhQATu/Cs6Kx1Xwv8AELXtW+wyahpet+S+635lheNNuCvcHJ5ppR1/AR2mn6ob3zvMsri0aGUxlZgPm/2hgnIq8ZR79M1k2cY1fyLu7t5rZ4WLRIZSDg/3gOPwNTPoVpJa3EDNc7biXzXIuHDA8cA5yo46Dipdhl95kUgMcFulAmDLnBHtVZtKt2u5LgmbfJH5RHmtgD2HQH361Xj8PWcSWyK91ttn8xM3LnJzn5ufmHsaVl3A0vNBHAP5Vk6x4htdIjjadZHMhICpjIx65NTXOi2s8d0rtcAXTKz7J3XGOm3B+X8K5fxdocySW19ZLLIYYzEQcvhfUg9T70mtNwHjx84JAsF6/wDPQ/4UH4gP0+wJz0/edf0rkv7FlFqIBaXXl7/NGN+d31649ulEmk3Mkk8j21yDcDEuFYDHt/d/Csve7gdhbePlaf8A0mxKx46xPuOfofxro9P1O31mzWe13Bd2CGHzL7HFeT/ZntrmF5I5ElgTbGHzjB9QfvfU1s+GEjlvn0+eSZbe5YyNtnZCHHPBByPpTjLWzYHfaNqUWo6ek8KyBXJwHAyMHHr7VoCQehrmfCOmwS6D9oYyB7lGifbKwAAJAwM8H3Fa7aJat9k+a4/0QYj/ANIfn/e5+b8a2drgXTMoJAySB0HeneYMZ557Vnf2BafZbmDfc7Lltzn7Q+QfY5yv4VN/ZUH2z7SWmL+T5OPNbbt+mcZ9+tKy7gWjKqrlsigSqTxn61QOg2jW9vAXudlu25D9ofJPuc5P40q6Jar9sw1x/pgxL+/bj/d5+Xr2osu4F7zBnAB/Km+evIXkg8gVTGiWouobgPcb4YfJUee20jGMkZ5PueaSPQrSO0jtle48uOTzATcOWJ9znJHtSsu4Gh5gxwCaa06IoL8D3qlJodrLcXMrvcbrmPy3xcOAB/sjPynjqKdBo9vA9uyNMTbIUTdMzZB9cnk+5osu4FwyD0OPpWRp+tWt3pD6kA8UMckiMXxn5HKn9RxUh8OWX2RoPMu9hl80n7U+7PpnOce3SvOGvUbT9ieYJnknjk2yFUCCVwPlHy5469ab5VG7EdXcePYlbNrZu6jqZG25/nUI8fOemnrn/rof8K4+KAn7NFEGdrc/uf4jkjHP978acNGmaOZPsl1iY7pPvg59j/CPYVgpX2ZR158euOtgvXB/eH/Cg+PHBO6wT6eaf8K5YafeCdJltZxJGnlqfLONvuOhPvUa6PcpHFGtrdbIX8yMEMTu56nqw56Him3LuB1v/CfNnH2BevHzn/ClHj5x1sFH/bTp+lco+mXUgn3Wlx/pGPMwrD/vn+7+FNXSbqOSGRLW5Dwpsj3KzDHuDw31NF31YHVnx638VgMA9pD/AIUHx83BFin/AH9/+tXJ/wBj3DQ+U9pdFfMMvAYHcff09ulPbTr1nmc2s+6dNj4jIGPYdj7ijml3EdUPHrj/AJcFBHbzD/hSf8J+5+X7AuT0/eH/AArk49HuY2tyLW6P2Y5iBDHvn5v7340j6NO8csZtLoJK/mMBvzu9j1A9hxTv3YHXDx+w6WMZHr5v/wBap7bx9btn7XaSIc9Y2DAfWuMbTrsXT3AtbjzZE8sgoxXb7L0B9+tVXtF8uKGTzFFu+5BvIIP+0e/0NTzW3YHrWoa3a2Wgz6kSZYY4Gmwh5YAZ4zVxCBJtAwVPQV5grwHwF4itJ55Gmkt5JlDSHsvReeBkdBxXoz6NbSXwu3efzRH5YxMwXH+7nGfet0k1cC6ZQqlmBwOppFlDsQAcDv2NUotDtYrWK3VrgpFKJlLTuWLD1Ocke3SnPo1vJJduWnBvAokxMwxgYG3n5fwo5V3AueYpPfrjpTuxqgdFtTPbTZm3Wy7Yx5zYP+8M/Mfc1dKnae2ahrVARTXUEH+tkROOrMBR50QK7pFw/wBznr9K8p+MOha3rOqaadEsbmeOOOQSmI8cjgHnmufn8F+K73U/D73Eupw262Eccghk+aKZXz8wJ4GO457VuqcXG9xXZ7p9vtxkmeLIBJ+ccYrOPiPT28P3WtWrPdWlsju/lAEkIDuxkj0rz3TNIvofH+tXH9iXJ0/VoTHE83S3dUAztzgBzn8q3PD+iX9v8Jb/AEmWyMF49tPEsXA3EqQDx60+WK6hdm+vi6yk8HJ4it4Lme3eFJhBEgaYBsYG3OM8+tT6f4q0rVNYn0q1n/063iWWaBh80YboD7+1eOXXgvxNJ4NlNjb3dtJDplrZNZqdpmnR8vIAD02kfN7V0Hw68MaxpPxM1rVNS05o7a9tIBFM5GQwVQR65yDVOnBLRhqd94h8W6f4cu9Nt7xJpX1K7S0jEW07HfoWBYEDg9M1qteW0Rk8yeMeUMvlh8o9TXiOoeEvEsHisNdadPfk+JINQjvA24JbAYKZPTB5xU8PhvxRceN57iXSpYLOdbyJlMxZW3D5GbPX29KPZxa3Fdnr1hrmm6jZpd2txG0ErFEcsBuIOOPxrQUZ5B4/mK8GvfCviU+G7Cw0/RJY5YbSUNMJACrg5GF6ZOOvWvb9HaRtGszcRtFMYE3o5yVO0ZBrOpFRWjGncu7fSjBpcUtYjENLSUtAxR0paQdKWuhbEhRRRTAKKKKACiiigApG6UtIamWwDQPzpoRByBTqWsPIY0KBRheop1FO9thjQqg5AwTS0tFJgJRiloosgEPNJjPWnUUAIBSEcGnUUAcZ4303zIo9QRjvjwjoB/Dk/N+fFcSxwP4vbacEV7DfWyXdlNbyZ2yoUO3qAa8pv7JtO1Ce0kOTG3B9QeRWMo++mgPQ/CiWtv4et7a0mMywjaxbru6n+dbVeUfDbVVsIIoZyxW5O0YJ4bccfnmvVl6DPWt29bCFxRS0YpWASiloxRYYmKMUuKMUWASlopCQOtAirez/AGW0mndsJGhcnHYV5JJZw2Us6W7NIskjTcnkFyXI/wDHq6/xzqLM8NhDKV58yXaxBI7Djr34rzzw3G01gqDlmuJVGf8Aro2KiprAfU7bwbphutTF05xHbjg5HzMRjH4CvQUGAfes7Q9P/s7To4Cqh1Hz7TwT3rTpU4pIAxRilorTQBMUYpaKNAEwKMUtFGgCYoxS0UaANKBvvDNeb+L9KOn6o08S4huCT9G716VWPr+lLqli6OpLRgvGV65xUSV0B5jHaLeMtrMxjScGF3HUKw2nr7E163ZXUd9Cl1byiSGQZUqcg/jXievAp4f1DPylbd8+3Br0bwTq6vG2mSYXygWiOeoJ5/U04XUdRPc7CjFIpB6HNOprUYUHmiimA3GKTaO9OpGYDqcfWnuIa7IikyMqr6scUz7TbZz58Wf98V5Z8Qo38c+PNJ8H2lyfsUIN1qPlsRhRjapI45549cV0C/BzwPtH/Emzx/z2f/Gur2UIRXO9ybt7HZ/arf8A57xf99ij7TbDpPF/32K4z/hTngf/AKA3/kZ/8aP+FOeB/wDoDf8AkZ/8am1H+Zjuzs/tNsf+W8X/AH2KPtNt/wA94v8AvsVxn/CnPA//AEBR/wB/n/xo/wCFOeB/+gL/AORn/wAadqPdhqdl9pts/wCvi/77FKLm2HSeL/vsVxn/AApvwP8A9AUf9/n/AMaX/hTfgcf8wX/yM/8AjS5KXdhqdn9rt/8AnvF/32KPtVv/AM/EX/fYrjP+FOeB/wDoDD/v8/8AjSf8Kc8D/wDQGH/f5/8AGjlo92Gp2guoCQBPESenzipciuMsvhV4P029ivLPR0E8LbkLSMwB+hOK66NNvbArGooR+FjROOlLSDpS1pHYQUUUVQBRRRQAUUUUAFIaWkNTLYBucUZpGbaKaZVAyenrXOMfmlqEzqD0+UjIOaDOM9vzp62AlpaYr7qfQMKKKKACiiigAooooARhleK4vxvpirCNRRQpB2yY/iHY12ucVUvrOO/tXt5xlJODSaA8Y0iG40+xijkDRTRnOD1BzkV6/oWpLqWjwTFsybQsnGPmAGa8se5F3K8wiMWWICnnABx/Sug8J6utlffZZiRDOQP91v6A1lzNTdwPRqKi+1Qf89U/76FH2qD/AJ7J/wB9CtboCWiovtUH/PVP++hSfaoP+eyf99Ci6AmoqL7TB/z2j/76FJ9qg/56p/30KLoCWoLqaOGFpJW2qiliacbqD/nqn/fVcj441JXihs4myG+d2U+nbrSbSQHI3lxJdXks8rb3dj83fHar3w60G5Eiy3lvtjjmlbDnuzllP5EGs2NPMkCLks3CgDOSe1ei+D5xd6HHcLD5LmR45F3bssjFM/jtqKd2nfYXU3lXbT6KK1QwooooAKKKKACiiigAooooAKQ9MUtJSYHlfxC0J4xdx2MLO19A4jQYGXII2iq2mXZsNSguVySjdu4zyK9B8VFbTwxfXpUyGzjNwF/vbPmxn3xivNXfLYxux3qKnMkuwdT1+1dZYUkUghgCDU9cb4K1hVt3sLhzuTLRljxt9K61buAqD5qD23CqTTAmoqL7VB/z2T/voUfaoP8Ansn/AH0Kd0BJmuH+LfiGXw18P7u8s2ZLuUiCF1GdrNnn24Brs/tMH/PZP++hXM+N/CmneONOtLG+vTDDBdJO4jIzIAD8vtnPWt8POEailPZCabWh5X8ALbV5tUv9VlVWsLhQkk8vMjuvTafbvXvy9Kz7KCw020jtLQwwwxqEREwAAKt/aYB/y1j/AO+hWuMxSxFZzSsTGNlYnpKjWeN1zGwb6GnqwauO5YvNLRRVXAOaSloouwEx70UtFIBKAKWigBR0paQdKWuhbEhRRRTAKKKKACiiigBKa/C0+mtUvYDzzxnrd/J4+8OeE4TLb2epJJNcXETbWbYrHywe33QTU0WtaDD4oOlWup3AmSFof7PbewGT9/J5/HPeuq1jRrXV4oluodzQuHjdTtZD7Ec1QXwrp0Ouyayscx1GeEW73Bck7M5xjoKSlHlGeY6lqOr+BNKu9P12a41PSdUhle11Dewe0lIOyMkc4yBzmr2q6bb2/wATPAthC9ylpqFncSXUQu5cSssalSfm7EmvR59CtbvSZdMvo5Lm0mQoySncQDxx6VVvPCGnX2uabq0n2hbvTI2itGWQgRqwAYY75AHWqU0KzMHQfEN1YfE3VPCpS4u7KGGOaGbG4w78/Kx9OOK619b2WlzN/Z9432eXy9ix/NJyPmUdxz19qk0zSLTTXne2hIlncvLI5yzn6nt7VobazlKL6DM9tUYXUsAtJz5cXmeYE+Vv9kH19qgj15pEtW/s69X7RJsKtFgx84y3PA9618UuKm8ewGVc601ut0wsLuT7MyrhI8mTPdPUDvUsepM90kJtp1EkXmbynyr/ALJPY+1aGKTFO8ewGP8A8JARZLcHTL/5pvK8vyfmH+1jP3fenyay8cl2gsLtvsqg5WPiX/c9TWttzQRSvHsBlprDPdWsJsroC4TfvMeFj9mPY0yXW9lnJObC9Ply+X5axfO3PUD0rWxTJSdvyjJppoDyue2ZtEimgtZM26M0s235ZASSAp7ntWWZxutv3cpFwuQQP9V/v+lesafY2g0cWtrhrVgy4DbgQSc8/iayD4DsWYsLiZAei5B2+3Ss5xTd7AeefaG8iaUxTfuTt2Bfmk91HcVKWIuDDnP7rzd4Pyf7uf73tXeDwFY44u5z+VA8A2Pa7nz+H+FRyrsB58bg/Z4Jgkv75tvl7fmj92HYU4TFvtPyyL9mGef+W3+5616B/wAIFZL1u5h+A/wpD4Cscc3c36f4UOK7AcAJibiOHZIPMi8wPj5V4ztY9m9qRLgtbJMY5V3vs8sj5l/2iPSvQf8AhArL/n7nx+H+FIfANl/z9z/p/hRyrsB5/LOYZp4zHJJ5Kb9yDKyeynufapIj5zQja0fnIXBk48vHZvQ13v8AwgNj2u5/0/wpD4BsyR/pUxGenH+FHKuwzlfDZWSRr6a0vHFrMqrHFHlieufpXTeEr82enPZi2nmCy3E3nRJmM5lc7c/3vaujsNOg0y18i1TCdST1JqDRbW1srExacQ8Bmc5V943FyW5+pPHat4qKjawh0erNL9j/ANDuU+1Z+9HzFgZ+f0qI6+yxXLnTb1vs77Noi5k9155Fa+KNvSlePYCgNTZrqOEWtwN8Xmbynyr/ALJPY+1RR60WtrWZrC8X7RN5XlmLDR8kbmHZeOvuK1NtLinePYDMk1gol2RY3RNsQMCP/W/7nrTYdYea6toPsV0nnpv8xo8LHxnDHsa1cUmKV0Bkya8Y7cSnTrx83Bh2rFkjH8fX7vvUz6m6yXKC1nPkIGyE4k9l9TWhijFO8QMqPW2f7F/xL7wfayfvRf6nnHz+lNfX2EE0o02+Iil8or5XzN/tKM8j3rYxRil7oGauqsb6S2a0uFEcXmeaU+Rv9kH156VGdcIt7aT+z7wm4fZtEXMfuw7CtXbRj0ovEDk/GGptN4E8Q5tLhBDbyRfMmN/H3l9Rz19jXM+KbdrXxCTHbOkFxH5gcJhAcfdz616Nq9ta3ejXlvqLKlrLCyzMz7AFI5+bt9agvdKh1KzFtdK2zrnOCKcuWUbWA8oSfzbeKbynTzHEflsuGXn7xH92laQq1yoDf6OAcjpLkZwnriu9/wCEDtGPNxOABweOf0pf+EAscf8AH1P+Q/wrFxXYDgDNtlhQpIfOTcGA4j46N6GpM+5ru/8AhALLB/0qf9P8KP8AhAbL/n6n/T/Cs5Qb2QzhOfU0n4mu8/4QGy/5+p/0/wAKP+EBsv8An6n/AE/wqeSQHCZPqaMn1Nd3/wAIDZf8/U/6f4Uf8IDZf8/U/wCn+FHJIDira+ubI7rWZ4znPynj8uleo6HdNfaPb3MihZJFywBz3rETwJYRuGeaeRe6kgZ/KujtIFtoViQbVQYUegrSCa3AsUtAorUAooooAKKKKACiiigBR0paQUtdEdiQooopgFFFFABRRRQAUhpaax4qXsAYowaF6U6ojFNXGN20badRVciEN20YNOoo5EA3BoxTqKORDuJg0mKdRRyILjcUYNOopezQhuDSEHdT6CM0+RIDI8N2Fxp2gw210oSVC2QDnqxP9a1cGnYoocUxjQuKNvNOoo5EFxpGaTb6inMSFJAyQOlcV4f8Va14iS8FsdJhuItwFrIX862YPgCVMgnIzgjA470uRAdpjikwfSuN0PxXrE/h7UNZ1xdOjtrV7iJUtw4ZnikZMkscYJX9aiHju+j8A6jq91aW9vqenuEmt3Y+WhLLgk9cYbNHIkFzuNvtRiuHsfFmualp+qNYPo90+n7HF3B5j20yFCSqkN99SOcEjkd63PCGparrGg2+o6wLNDdRJNElqGG0MM4O4nJ+lPkQrm2ymsbwrptzpei/ZrtAkv2iaTAYHhpGYdPYitvrQBijlQxMGjFOoo5EFxuKMU6ijkQXG4oxTqKORBcbiinGm1nJWAKKKKkYUlLSGkwMPxsP+KD1r/ryl/8AQTW5/EayfFNpPqHhHVLO0j8yee1kjjTONxK8CtKOXeRheCOtX0ESClpBS1LGFFFFABRRRQAUUUUAFJilooAKKKKACiiigAooooAKKKKAFFLSClrojsSFFFFMAooooAKKKKACmSHCZHNPprDK1MtgEiOVzT6aowKdShsAUUUVYBRRRQAUUUUAFFFFABRRRQAUUUUAFFFFABRRRQAjAshAJUkYBHauYsfDF+PEsWsazqdtdyW0MkMAtrH7OzByMmRt7bz8oxgKOvHp1FJtFIDj5fAYuPDP9iTanJ9mk1CS8uDEhjaRXlaTywQ2V5bG4Ht0FQXHw4hKarDY6rdR2+pxRLMl28l0wdHBD75HzyAFx+Ndvto2imBz8PhhbW91iS0uRFa6pCge2EXEcwUo0oOf4l2AjH8Gc81oaFpv9jaDY6b5vnfZYEh8zbt37RjOMnH51obRRgUALRRRQAUUUUAFFFFABRRRQAGm0402sp9BoKKKKzGFIaWigRmeINQk0nw3qOoQKryW1u8qq+cEgZ5xV9IwmAOx4rG8bf8AIia3/wBeUv8A6Ca2yfm5qto3AXvS0lLUjCiiigAooooAKKKKACiiigAooooAKKKKACiiigAooooAUUtIKWuiOxIUUUUwCiiigAooooAKQ9KWkNS9gAUtIKWiOwBRRRVAFFFFABRRRQAUUZozQAUUUUAFFFFABRRRmgAooooAKKKKACiiigAooooAKKKKACiiigAooooAKKKKAA02nU2spjQUUUVmMKQ0tFAitf2UOo6bc2d0u+G4jMbrnGQRg06JCME8c1PRigA70UUUDCiiigAooooAKKKKACiiigAooooAKKKKACikpaACiiigBRS0gpa6I7EhRRRTAKKKKACiiigApDS0hqZbAJnFGaKKx5mVYM0jPhc0tIeKfMxGdfa/p+mSIupXcFrvHy+dKFz+dVh408N4513Tx/28p/jXmmt6ZY67+0ZBp2sWsd3ajTN/lSjK59cV3I+F3gkDnw3YH/tkK7HCnGKcm9Sbtmn/AMJp4b/6D2nf+BK/40f8Jn4a/wCg9p3/AIEr/jWb/wAKu8E/9C1p/wD35FJ/wq/wT/0LWn/9+RS/c92Gpp/8Jp4a/wCg7p3/AIEr/jR/wmfhr/oPad/4Er/jWUfhf4M7eGdO/wC/Ipf+FXeC/wDoWtO/78ii9Huw1NT/AITPw1/0HtO/8CV/xo/4TPw1/wBB7Tv/AAJX/Gsz/hV3gn/oWtO/78ik/wCFX+Cv+ha07/vyKL0e7DU1P+Ez8Nf9B7Tv/Alf8aP+Ez8Nf9B7Tv8AwJX/ABrL/wCFX+Cs8+GtOx/1yFB+F3grt4Z07/vyKL0e7DU0z4z8N9te07/wJX/Gj/hM/Df/AEHtN/8AAlf8azR8LvBOOfDWn/8AfkUf8Kv8Ff8AQtaf/wB+RRej3Yaml/wmnhv/AKD2m/8AgSv+NH/CZ+G8/wDIe03H/Xyv+NZg+F3grdz4a07/AL807/hV3gj/AKFrT/8AvyKP3PdhqaP/AAmfhv8A6D2nf+BK/wCNL/wmfhr/AKD2nf8AgSv+NZv/AAq7wT/0LWn/APfkUf8ACr/BH/Qtaf8A9+RSvR7sNTS/4TLw1/0HtO/8CV/xo/4TPw1/0HtO/wDAlf8AGs3/AIVf4I/6FrT/APvyKP8AhV/gj/oWtP8A+/IovR7sNTR/4TTw1/0HtO/8CV/xpf8AhM/DX/Qe07/wJX/Gs3/hV3gn/oWtP/79Cj/hV3gn/oWdP/79Ci9Huw1NL/hM/DX/AEHtO/8AAlf8aP8AhM/DX/Qe07/wJX/Gs3/hV3gn/oWdP/79Cj/hV3gn/oWdP/79Cnej3Yaml/wmfhr/AKD2nf8AgSv+NJ/wmfhr/oPad/4Er/jWd/wq7wT/ANCzp/8A36FH/CrvBP8A0LOn/wDfoUXo+Yaml/wmfhr/AKD2nf8AgSv+NH/CZ+Gv+g9p3/gSv+NZv/CrvBP/AELOn/8AfoUf8Ku8E/8AQs6f/wB+hRej3Yaml/wmfhr/AKD2nf8AgSv+NH/CZ+Gv+g9p3/gSv+NZv/CrvBP/AELOn/8AfoUf8Ku8E/8AQs6f/wB+hRej3Yaml/wmfhr/AKD2nf8AgSn+NJ/wmXhr/oPad/4Er/jWd/wq7wT/ANCzp/8A36FH/CrvBP8A0LOn/wDfoUn7F73DU0f+Ey8Nf9B7T/8AwJX/ABo/4TPw1/0HtP8A/Alf8azv+FXeCf8AoWdP/wC/Qo/4Vd4J/wChZ0//AL9Clah5h7xo/wDCZ+Gv+g9p/wD4Er/jR/wmfhr/AKD2n/8AgSv+NZ3/AAq7wT/0LOn/APfoUf8ACrvBP/Qs6f8A9+hRah5h7xo/8Jn4a/6D2n/+BK/40f8ACZ+Gv+g9p/8A4Er/AI1nf8Ku8E/9Czp//foUf8Ku8E/9Czp//foUWoeYe8aP/CZ+Gv8AoPaf/wCBK/40f8Jn4a/6D2n/APgSv+NZ3/CrvBP/AELOn/8AfoUf8Ku8E/8AQs6f/wB+hRah5h7xo/8ACZ+Gv+g9p/8A4Er/AI0f8Jn4a/6D2n/+BK/41nf8Ku8E/wDQs6f/AN+hR/wq7wT/ANCzp/8A36FFqHmHvGj/AMJn4a/6D2n/APgSv+NH/CZ+Gv8AoPaf/wCBK/41nf8ACrvBP/Qs6f8A9+hR/wAKu8E/9Czp/wD36FFqHmHvGj/wmfhr/oPaf/4Er/jR/wAJn4a/6D2n/wDgSv8AjWd/wq7wT/0LOn/9+hR/wq7wT/0LOn/9+hRah5h7xo/8Jn4a/wCg9p//AIEr/jR/wmXhr/oPaf8A+BK/41nf8Ku8E/8AQs6f/wB+hR/wq7wT/wBCzp//AH6FK1DzD3jR/wCEy8Nf9B7T/wDwJX/Gj/hM/DX/AEHtO/8AAlP8azv+FXeCf+hZ0/8A79Ck/wCFXeCf+hZ0/wD78inah5hqaf8AwmXhr/oPad/4Er/jTW8Z+GwpI1zT29hcp/jWf/wq/wAEf9Czp/8A35Fc74++HvhPTPAOsXthoNlBcwWrvHIkYDKQOCKqMKMpKKuDbPSIJ0uIlkhdXRhkMpyCKmFcd8KWL/C/QpHbLG25J/3jXYA5Fcs48knFlJ3VxaKKKgYopaQUtdEdiQooopgFFFFABRRRQAUhpaQ1L2ASiiisChD0pO1KelIfu0uoHk0o/wCMoov+wTXrLcLxXk0v/J0UX/YJr1lh6V14jaPoTE84uPic0fi/VNAKW0F5azRx2kMzkNdhgCSOMcZrR074g2Il1H+3L2zthb3jW8IjckkKoY7hjggZNZWu+Adc1zxQk94dNn09boTRzMCtxAoxwpA56dzXF+KPAHiOx3ulpDfyXupyXLGFJWVEaPaVYopYZHoKajCQtT1KT4m+D47e3nbXIBFcxtLC2Dh0UkEjjoCDVqfx14btriK3m1eFZZvL2Kc8+Z9z8+1eSx/CfXdb0PS3toLPSVtrCezFrKZMjfI2T8y56cjPPNbeq/CTX9Vl02V9UtYzYLa7FVON0R5OcZPAHWl7Omuoana+EfFtz4jh8RNPbpCdJ1SeyTYxO9UUEMfQ81X+HPjO78baDPqN1bRW/lXDwhI2JBC9+aTwZ4S1bw5F4jS7mtpRqt/LexGMn5S4wQePYVzXhPwH428L6Q+lQX2mLbTXBmlkRn8znkgcUNQ1DU6LSPiNYtpd1e+Ibyzs40vntYWhdmDbV3YPH3sZOK03+IHhWPT7a9k1u3W2ukLwyEnDqDgn8+K8+Hwn8Tf2CbA3enMTqUt8GJbjfEUx07ZzT7X4MX8Nl4eD3Vo8+nrJDdb13pJGzlgVUjGRmjkp9x6np+meINM1ksNKvI7oKSGKHOK1h90Z615/4K8D6h4b8UapqN01ssN2oVFtmb5sE8sp4Xj0r0AZxzWM1FPQYYFGKWisxiYowKWigBMUYpaKAExRRRQAUUUUAFFFFABRRS0AJRS0UAJRS0UAJRS0UAJRS0UAJRS0UAJRS0UAJRS0UAJRS0UAJRilooATFGKWigBMUYFLRQAYFcr8TP8Akmevf9eb/wAq6uuV+Jn/ACTPXv8Arzf+Vb0f4iJexX+FH/JKdA/69v8A2Y12Ncd8J/8AklOgf9e3/sxrsamt/EYR2CiiisihRS0gpa6I7EhRRRTAKKKKACiiigApDS0hqXsAlFFFYFCHpSH7tKelIelLqB5NL/ydFF/2Ca9ZJ2jHqa8ml/5Oii/7BNessMrzXXiPhj6Eo5W5+I3hy11uTSZLtjeRy+S0aRsfn27sdPSoIfif4Zn0O51aK4uDZWpAmk8h8od23GMZzntWZafDm70vxxqmt2F/ZmK/lEwhuLbe0TgY4bt+FYOqeAte0Lwr4gWzuIb/APtSZJzbwQkOJty5YZONuB0pRjTvow1Ok1D4o6cNDkv9BH2t4LqCCaKdGiK+b0PIz0Oa2LHx5ot5cfZ45pPOEcjlfLOPkGXxx2zXGRfDLUtV0e7up9Qhhv8AUpbSaQPCdsYgUALjPU45q7YfDTVrLXBqj61bzzfvQQ1uQMOoAHXtiq5aW1xam7pHxP8ADOtzTQ2N1MXhtjcsJLd0zHnGRkc81T1P4raDZWc8lv51xPDcpbtEI2BVmx3x6Gsqy+GWrWd9a3K6xbBrfRjpQKQnP3mYPyfVulV7P4O3FrFfKdXjY3E8NwhEGNrpjrz3xUqNJathqdPD8Q9NS5ulvT5ax3cVpCFRi7ySKCqkY7k06/8Aid4b023tZrm4nIujKI1jgZ2zG21wQBxg1iX3w31S91h9QOqWocanBqMI8k8PEu0BuehGelQN8K75Gs5rXVLdJovtTTFomKu0x7c8ACnale9w1O307xXpWqXFpDZySu15AbiE+UwBUepxwfatsc81yvhjw7qfh+z02zfUYpre1gaKRVixvYnIYHtXVDoPpWElHoVqLRRRUDCiikPSgBgkBz9cU/PtXmfxj8aap4O0CCTSIkWS5kMZuHOfL49PWvB/+FqeMv8AoYLj9KtQbV0S5JH2Jn2pN1fHn/C1PGf/AEMFx+lH/C1PGf8A0MFx+n+FP2ciedH2Ju9qTPtXx5/wtPxn/wBDBcfp/hR/wtPxn/0MFx+n+FHs5Bzo+w8+1Lk18d/8LT8Z/wDQwXH6f4Uf8LU8Z/8AQwXH6f4UezkHOj7E3Uzzl+Xr8xwK+Pv+Fp+M/wDoYLj9P8K9a+C3xE17xbrdzpeuPHNHaWnnRyBMOSGVeT3zu/Sk4tbjUrntQpaQdKWoLCiiigAooooAKKKKACmu4RCzHAHWnHpXNeNLyW20YLAxXzZNjEdhjNTJ2VwNsahad7iMfVxS/wBoWn/PzF/32K8g+pNJgVl7UD2D7faf8/MX/fYo+32n/PzF/wB9ivH8CjFHtQPYPt9p/wA/MX/fYo+32n/PzF/32K8gxSYo9qB7B9vtP+fmL/vsUf2haf8APzF/32K8fwKXApe1A9gW9t3GY5kf2VgamRw/SvHEkaOQNEzIQcgg4Nep6DO11o1tcS/6yRMt+eK0jPmA0qKKK0AWuV+Jn/JM9e/683/lXVVyvxM/5Jnr3/Xm/wDKt6P8REvYr/Cf/klOgf8AXt/7Ma7GuO+E/wDySnQP+vb/ANmNdjU1v4jCOwUUUVkUKKWkFLXRHYkKKKKYBRRRQAUUUUAFIaWkNS9gEooorAoQ9KQ/dpT0pD92l1A8ml/5Oii/7BNetdq8ll/5Oii/7BNetdq68RtH0JiGAaYYlIxjr708dKWuVFDAgAAx+dLtHpTqKAG7B6UYFOooAaVU9aXAxS0UAN2jOadRRQAUUUUAFIeaWk6UAUdQ0jTtWt/s+qWVveQk5Mc8YdfyNZn/AAgHhD/oWdJ/8A0/wrO8T+P7TwprllY6jYXJhu2Ci7Qjy4yzY+bv1qK5+JWnWfjY+Hp7WdSsTSvekgRKqjLH1OMVooSewtDW/wCEA8If9CzpP/gIn+FJ/wAIB4Q/6FnSf/ARP8KyLD4hSavpTarpOg3t3p3mmOO4VlBkwcFguc7f8Kt6Z42j1e+1uzg0y4MmjSCObc6jeSNwxz6UckhaFz/hAPCH/Qs6T/4CJ/hS/wDCAeEP+hZ0n/wET/Cm+IfFln4a0GLVdTVokkZVEZP8TdAT0HTrVFPHcC6TBeTWj4uLtbeMJKrBg38YYcY5+tHJK1w0ND/hAPCH/Qs6T/4CJ/hR/wAIB4R/6FnSv/ANP8KV/HHhqG6kt5tYtlljDF1LHgDqfwp9n418Nags7Wes2kwt4xLKVf7iep9qnlmPQj/4QDwj/wBCzpX/AIBp/hV3TPDei6LI8mj6VaWTSDDm3hVN2OmcCsHWfiRo+mrYSWhbUIr26W1EluwxG7EY3A/WuxX7optNLUBRS0UVAwooooAKKKKACiiigAqjqmmQ6pYvb3G4K3O5Typ9RV2obyY21pJMEMhRS2wHBOO1Fr6AcuPAlizkfabkD1yv+FP/AOEBsP8An7uvzX/Csex+LOnXmnx6jd6fc2OnPdmzNzK6lVlyRyBzjjrVx/iPajVtesU064Z9DjjknfzFAkDruXb+FP6u+wrlv/hAbD/n7ufzX/ClHgGw/wCfu5/Nf8Ko3fxDNp4cXXJNAvTZNAk28SIMBjgDr15rctNeeTRbvU76wnsY7ZS+2Qhi6BQ24be3OKXsLBcpf8IDYf8AP3c/mv8AhSHwDYf8/dz+a/4VjWvxTtrzQbvWoNLmexhtvtCTLKhDnIGzrw31rpR400KH7NFfajDbXNwiMsDt8w3Dgcd6boeQXKf/AAgNj/z93P5r/hR/wgNh/wA/dz+a/wCFaNp4w8PX2o/YLPVraW7yw8lX+bK/e49qqXvjbR4tO1G7sLhdQbTYzJcQwt8yAfX6Gp9j5BdEB8B2Ccm6uiB2BUZ/SumtYlhhWOIYjUYUelRaddDULG3vEBVJ4xIqnqARkVcpcnKxgKKKKoBa5X4mf8kz17/rzf8AlXVVyvxM/wCSZ69/15v/ACrej/ERL2K/wn/5JToH/Xt/7Ma7GuO+E/8AySnQP+vb/wBmNdjU1v4jCOwUUUVkUKKWkFLXRHYkKKKKYBRRRQAUUUUAFIaWkNS9gEooorAoQ9KQ/dpT0pD0pdQPJpf+Toov+wTXrXavJZv+Toov+wTXrXauvEbR9CUA6UtFFcpQUUUUAFFFFABRRRQAUUUUAFFFFABSdaWgUAcX4z8H3His3Fs+xIJLXbHNu+aOUNuU4x6iuXl+F2sXniLTpNQmhltItMezubjzT5kjsDlgMe/rXrStkHjHNOraNWUVZCsmcD4H8OeI/Cfg+LQJo7GdraZhDciU7TEWzkrj73J4/WotO8LeIdF8QeKryyhsp49alWWFnmZTGQm07ht/lXodFL2j1Cxy3ivRtT1TRbGys4LS5Qzot9FcHAkgxhwpwefSuPk+Gl3pnhWbTNOVVs11MXiRSzkmOIAbgDjOeuBXrNIwytEariKyPnfS9Hs9Tu/7Psorl7ye3ubWxzIhSLcCSZOd44HUrW9bfC7xHZ+e1tb6WS+gwaeFklODMj7mbhfyNeyLaxJIzpGis3UhQCfxqVQRnNW67a0Cx4fa/CbxRFCqzGy3DWY77i4Y/IoXIztHPBr3BeFGadRWc6jnuOwUUUVmMKKKKACiiigAooooATtUN4jTWUscYyzIQMnHap6QdKE7MDxuy+FevT+EIvDup/ZI4DrH2+WaOYsfLBJ2gbevNaM/w1vbjxH4wvp7a3li1WC3jsN0x3IY49h3ccc46Zr1Sit/bSRPKjgdU8KaxefCaDw5DHAL5YY4mJlwg245zj2rpbuz1H/hE5bWx8r7d9l8uISH5N+3HJx0z7Vs0VDm2Ox4rqXwi1R21l9GS302HU7AwtZLcExecWByBt4GBWR9isNN8biPVra7mFvdWh8u3kQs06qFBAYhiuW7DtXv7qWHBxURtYmlEjRxlwMBigyPxrVV9NSbHj2mfDDxBa+Nk1ry7HyBf3lyf3x3MkuNoI29setLoXwy8VWB8TPff2eW1azNvCsU5why2M5XgYNeyqMCnUvbyHylDRbSWw0SztZwBJDCqMAcgEDHWr9FFYNtu7KCiiikAtcr8TP+SZ69/wBeb/yrqq5X4m/8ky17/rzf+Vb0f4iJexX+FH/JKdA/69v/AGY12Ncd8KP+SU6B/wBe3/sxrsamt/EY1sFFFFZDFFLSClrojsSFFFFMAooooAKKKKACkNLSGpewCUUUVgUIaQ/dpxpD92gR5LN/ydFF/wBgivWgflrxjXNVsdF/aSiu9UuorSAaUF8yVwq5PbJr0BfiL4Q2/N4k03/wJWu2tCUoxaXQlHT0Zrmf+Fi+D/8AoZdM/wDAhf8AGl/4WN4Q/wChl0z/AMCV/wAa5/Yz7Mq50tFcz/wsbwf/ANDLpv8A4Er/AI0f8LG8H/8AQy6Z/wCBK/40/Yz7MVzpqK5n/hY/g/8A6GXTP/Alf8aP+Fj+D/8AoZdM/wDAlf8AGj2M+zC501Fcz/wsbwf/ANDLpn/gSv8AjR/wsbwf/wBDLpn/AIEr/jR7GfZhc6aiua/4WN4P/wChl0z/AMCV/wAaT/hY/g//AKGXTP8AwJX/ABo9jPswudNRXM/8LH8H/wDQy6Z/4Er/AI0f8LH8H/8AQy6Z/wCBK/40exn2YXOmormf+Fj+D/8AoZdN/wDAlf8AGl/4WP4P/wChk03/AMCVo9jPsx3Okpc1zP8Awsbwf/0Mmm/+BK0v/CxvB3/QyaZ/4Er/AI0vY1OwXOlzRmua/wCFi+Dv+hl0z/wIX/Gj/hYvg7/oZdM/8CF/xo9jU7Bc6XNFcz/wsXwd/wBDNpv/AIEL/jS/8LG8H/8AQzaZ/wCBC/40exqdgudLRXM/8LG8Hf8AQzaZ/wCBC/40f8LG8H/9DLpp/wC3hf8AGj2FTswudNmiuZ/4WN4P/wChk0z/AMCV/wAaP+FjeD/+hk03/wACV/xp+xqdgujpqK5n/hY3g/8A6GTTP/AlaX/hY/g//oZdM/8AAlf8aXsanZhc6WiuZ/4WN4P/AOhl0z/wJX/Gj/hY/g//AKGXTf8AwJX/ABo9jU7MVzpqK5n/AIWP4P8A+hl0z/wJX/Gj/hY/g/8A6GXTP/Alf8aPYz7MLnTUVzP/AAsfwf8A9DLpv/gSv+NH/Cx/B/8A0Mum/wDgSv8AjT9jPswudNSVzX/Cx/B//Qy6b/4Er/jR/wALH8H/APQy6b/4ErS9hPswudNmjNcz/wALG8H/APQy6Z/4ErR/wsbwf/0Mmm/+BK0ewn2YXR02aM1zP/CxvB//AEMum/8AgStH/Cx/B/8A0Mum/wDgStP2M+zC6OmzSVzX/CxvB/8A0Mum/wDgStL/AMLG8H/9DLpv/gStHsZ9mF0dJmlzXM/8LG8H/wDQy6b/AOBK0f8ACxvB/wD0Mum/+BK0vYz7MLnTZozXM/8ACxvB/wD0Mmm/+BC0f8LG8H/9DLpv/gStP2M+zC6OmzRXNf8ACxvB/wD0Mumf+BK0n/CxvB//AEM2m/8AgQv+NL2M+zC502a5b4mf8ky17/rzf+VP/wCFjeD/APoZtM/8CF/xrnPiD468L6h8P9ZtLHX9PnnmtXVI451LMcdAM1rRpTVROwPY2fhR/wAkp0D/AK9v/ZjXY1x3wqIPwr0Hb0+zdx/tGuxrKt/EY1sFFFFZDFFLSClrojsSFFFFMAooooAKKKKACkNLRQA3FGKdRUciHcbimSKSmB1+tS0UciEc3rfgXw/4mmjl8QaVBeyxjCu5IIH1BGay/wDhTvgT/oW7f/v5J/8AFV3GKK1UpJWTFY4f/hTvgP8A6Fu2/wC/kn/xVH/CnPAf/QuW3/fb/wDxVdxRT559wscP/wAKc8B/9C5bf9/H/wDiqP8AhTngP/oXLb/v4/8A8VXcUUe0n3CyOH/4U54D/wChctv++3/+Ko/4U54D/wChctv++3/+KruKKPaT7hY4f/hTngP/AKFu2/7+P/8AFUf8Kc8B/wDQuW3/AH8f/wCKruKKPaT7hY4f/hTvgP8A6Fy2/wC/j/8AxVH/AApzwH/0Llv/AN/H/wDiq7iij2k+4WRw/wDwp3wH/wBC5bf9/H/+Ko/4U54D/wChct/+/j//ABVdxRR7SfcLI4f/AIU54D/6Fy2/7+P/APFUf8Kc8B/9C5bf9/H/APiq7iij2k+4WRw//CnPAf8A0Llt/wB/H/8AiqP+FO+BP+hbt/8Av4//AMVXcUUe0n3CyOH/AOFO+A/+hbt/+/j/APxVH/CnfAn/AELlv/38f/4qu4oo9pPuFkcP/wAKc8B/9C3bf9/H/wDiqP8AhTngP/oXLb/v4/8A8VXcUUe0n3CyOH/4U54D/wChctv+/j//ABVH/CnPAf8A0Llt/wB/H/8Aiq7iijnn3Cxw/wDwpzwH/wBC5bf9/H/+Ko/4U54D/wChctv+/j//ABVdxRRzz7hZHD/8Kc8B/wDQuW3/AH8f/wCKo/4U74D/AOhctv8Av4//AMVXcUUe0n3CyOH/AOFOeA/+hctv+/j/APxVH/CnPAf/AELlt/38f/4qu4oo9pPuFkcP/wAKc8B/9C5bf9/H/wDiqP8AhTngP/oXLb/v4/8A8VXcUUe0n3Cxw/8AwpzwH/0Ldt/38f8A+Ko/4U54D/6Fy2/77f8A+KruKKPaT7hZHD/8Kc8B/wDQt23/AH8f/wCKo/4U54D/AOhbtv8Av4//AMVXcUUe0n3CyOH/AOFOeA/+hbtv+/j/APxVH/CnPAf/AELdt/38f/4qu4oo9pPuFkcP/wAKc8B/9C5bf9/H/wDiqP8AhTngL/oXLb/v4/8A8VXcUUe0n3CyOH/4U54D/wChbtv+/j//ABVH/CnPAf8A0Llt/wB/H/8Aiq7iijnn3CyOH/4U54D/AOhctv8Av4//AMVR/wAKc8B/9C5bf9/H/wDiq7iij2k+4WRw/wDwpzwH/wBC5bf9/H/+Ko/4U74D/wChbtv+/j//ABVdxRR7SfcLI4b/AIU74D/6Fu2/7+Sf/FUv/CnfAf8A0Ldt/wB/JP8A4qu4oo559wsjhv8AhTngT/oW7b/v5J/8VSP8HvAyoTH4btt3b94//wAVXdUYpc8+4WRT0+wh07T4bS0iWGGFdqRp0UelWgKdRWXKm7sY3FGKdRRyIdxBS0UVQgooopgFFFFABRRRQAUUUUAFFFFABRRRQAUUUUAFFFFABRRRQAUUUUAFFFFABRRRQAUUUUAFFFFABRRRQAUUUUAFFFFABRRRQAUUUUAFFFFABRRRQAUUUUAFFFFABRRRQAUUUUAFFFFABRRRQAUUUUAFFFFABRRRQAUUUUAFFFFABRRRQAUUUUAFFFFABRRRQAUUUUAf/9k=)

Bit 1:

![Diagram

Description automatically generated](data:image/jpeg;base64,/9j/4AAQSkZJRgABAQEAeAB4AAD/4RDcRXhpZgAATU0AKgAAAAgABAE7AAIAAAAGAAAISodpAAQAAAABAAAIUJydAAEAAAAMAAAQyOocAAcAAAgMAAAAPgAAAAAc6gAAAAgAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAGFkbWluAAAFkAMAAgAAABQAABCekAQAAgAAABQAABCykpEAAgAAAAMwOAAAkpIAAgAAAAMwOAAA6hwABwAACAwAAAiSAAAAABzqAAAACAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAMjAyMjowMTowOCAxMDoyODoxNAAyMDIyOjAxOjA4IDEwOjI4OjE0AAAAYQBkAG0AaQBuAAAA/+ELGGh0dHA6Ly9ucy5hZG9iZS5jb20veGFwLzEuMC8APD94cGFja2V0IGJlZ2luPSfvu78nIGlkPSdXNU0wTXBDZWhpSHpyZVN6TlRjemtjOWQnPz4NCjx4OnhtcG1ldGEgeG1sbnM6eD0iYWRvYmU6bnM6bWV0YS8iPjxyZGY6UkRGIHhtbG5zOnJkZj0iaHR0cDovL3d3dy53My5vcmcvMTk5OS8wMi8yMi1yZGYtc3ludGF4LW5zIyI+PHJkZjpEZXNjcmlwdGlvbiByZGY6YWJvdXQ9InV1aWQ6ZmFmNWJkZDUtYmEzZC0xMWRhLWFkMzEtZDMzZDc1MTgyZjFiIiB4bWxuczpkYz0iaHR0cDovL3B1cmwub3JnL2RjL2VsZW1lbnRzLzEuMS8iLz48cmRmOkRlc2NyaXB0aW9uIHJkZjphYm91dD0idXVpZDpmYWY1YmRkNS1iYTNkLTExZGEtYWQzMS1kMzNkNzUxODJmMWIiIHhtbG5zOnhtcD0iaHR0cDovL25zLmFkb2JlLmNvbS94YXAvMS4wLyI+PHhtcDpDcmVhdGVEYXRlPjIwMjItMDEtMDhUMTA6Mjg6MTQuMDgwPC94bXA6Q3JlYXRlRGF0ZT48L3JkZjpEZXNjcmlwdGlvbj48cmRmOkRlc2NyaXB0aW9uIHJkZjphYm91dD0idXVpZDpmYWY1YmRkNS1iYTNkLTExZGEtYWQzMS1kMzNkNzUxODJmMWIiIHhtbG5zOmRjPSJodHRwOi8vcHVybC5vcmcvZGMvZWxlbWVudHMvMS4xLyI+PGRjOmNyZWF0b3I+PHJkZjpTZXEgeG1sbnM6cmRmPSJodHRwOi8vd3d3LnczLm9yZy8xOTk5LzAyLzIyLXJkZi1zeW50YXgtbnMjIj48cmRmOmxpPmFkbWluPC9yZGY6bGk+PC9yZGY6U2VxPg0KCQkJPC9kYzpjcmVhdG9yPjwvcmRmOkRlc2NyaXB0aW9uPjwvcmRmOlJERj48L3g6eG1wbWV0YT4NCiAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAKICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgIAogICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgCiAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAKICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgIAogICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgCiAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAKICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgIAogICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgCiAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAKICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgIAogICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgCiAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAKICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgIAogICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgCiAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAKICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgIAogICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgCiAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAKICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgIAogICAgICAgICAgICAgICAgICAgICAgICAgICAgPD94cGFja2V0IGVuZD0ndyc/Pv/bAEMABwUFBgUEBwYFBggHBwgKEQsKCQkKFQ8QDBEYFRoZGBUYFxseJyEbHSUdFxgiLiIlKCkrLCsaIC8zLyoyJyorKv/bAEMBBwgICgkKFAsLFCocGBwqKioqKioqKioqKioqKioqKioqKioqKioqKioqKioqKioqKioqKioqKioqKioqKioqKv/AABEIAPkB7AMBIgACEQEDEQH/xAAfAAABBQEBAQEBAQAAAAAAAAAAAQIDBAUGBwgJCgv/xAC1EAACAQMDAgQDBQUEBAAAAX0BAgMABBEFEiExQQYTUWEHInEUMoGRoQgjQrHBFVLR8CQzYnKCCQoWFxgZGiUmJygpKjQ1Njc4OTpDREVGR0hJSlNUVVZXWFlaY2RlZmdoaWpzdHV2d3h5eoOEhYaHiImKkpOUlZaXmJmaoqOkpaanqKmqsrO0tba3uLm6wsPExcbHyMnK0tPU1dbX2Nna4eLj5OXm5+jp6vHy8/T19vf4+fr/xAAfAQADAQEBAQEBAQEBAAAAAAAAAQIDBAUGBwgJCgv/xAC1EQACAQIEBAMEBwUEBAABAncAAQIDEQQFITEGEkFRB2FxEyIygQgUQpGhscEJIzNS8BVictEKFiQ04SXxFxgZGiYnKCkqNTY3ODk6Q0RFRkdISUpTVFVWV1hZWmNkZWZnaGlqc3R1dnd4eXqCg4SFhoeIiYqSk5SVlpeYmZqio6Slpqeoqaqys7S1tre4ubrCw8TFxsfIycrS09TV1tfY2dri4+Tl5ufo6ery8/T19vf4+fr/2gAMAwEAAhEDEQA/APpGig0malySAWikzRmlzoBaKTNGaOdALRSZozRzoBaKTNGaOdALRSZpN3NHOgHUU3dzRmjmQDqKbupc0c6AWikzRmjnQC0UmaTJo50A6im5o3Uc6AdRTd1G72o5kA6imBqXdRzoB1FN3Ub6OdAOopu6jce1HOgHUU3JoyfajnQDqKZuPtRuNHOgH0UzJ9qXcfajnQDs0U3caM0c6AdRTd1G6jnQx1FN3UbqOdAOopu6jdRzoQ6imhqXNHOgFopM0Zo50AtFJmjNHOgFopM0Zo50AtFJmjNHOgFopM0Zo50AtFJmjNHOgFopM0opqSYBRRRVAIelJSnpSVlPcaCiiisxhRRRQAUUUUAFFFFABSd6WkoAyPE9xNaeGdRuLZiksdu7K6nlSB1rViJMEZPJKgn8qzfElvLe+Hb+0t13TT27xoMgZJHqa0ogVt4weoUA/lVfZEPoooqRhRRRQBSv9Y07Sgp1K9gtA/3TNIFz+dUv+Ew8Of8AQc0//wACV/xqDxR4I0PxisA1208/yCdhDFSPxFc9/wAKQ8C99Kf/AL/v/jT0A6O68deF7O2eefXbERoMnbMGP5Dms+1+Kfgm8mjih8Q2u+ThVfcvPuSMCsPUfgV4OudPmhsrWWzndSI51lZth9cE81iWn7OHh9YE+3avqUs20b2hKIue+AVJx+NP3SdTtrG6u9f8DzNYat9nuJZLgJerhtiCZwrDsflAxXm83iPxfoF7ptpqOs3F0ZU+1BmVQ0q/aEQIcDupP516j4U8OxaN4Nj0OSHZDG06bd2T5bSuV59dpFTz+HNB1V7NpbeKdtOwsLBuU24wpI9wDg9xW0ZKLd1oBzF58VktbxbVdImmmZrpQiSrkmDbnr/e3cVr6d44j1XwTd+ILCzaZbUvvg34YbBlgcjgjnj2p938O/DV/qc1/NZYuZWZndJCpywAPQ8Z2itTTtB0vRNJk021iCWsxYyCRs7y33sk9c0pOm9Eg1OI1L4y2mmRpK+lzSwyWYvkcSgboWlEYI46knOPSq+m+N9Wt7hY55DdRHU7uNjIwBEcakhQf611t54M8LXy2MdzY27C0jEVumesanIQj+JQRnHPIzRB4P8ADE0fkxwR3I8159pk3/Mwwzde9UpQS2DU5ZPjTbyR3Zj0idzbXEMLbZB0kz83TOBj9a1NL+JT6g0aSaFeW7rHFLcI5G6FJCwDY6nAXPHPNM8Q/CPR9R04w6Ds0W4aaOR5oFIJCA4HBGDz1rV0HwFZaZDp0upTy6nqdijIL6ZjvkBcsA3PO3OBnOKTdK2gtTk9W+I76X8SFZZrmfSZLJcWpTYBKXC7vmGR1rT1n4ovo3neZosz+RaR3Uw89RsDSeXj3ORmuk1TwNoWtanLf6jZia4mg+zsxY/c9Mfh1qvc/Djw7drtntXdTAluQZW5RDkA8+ozQpUtLodmYOv/ABLurKy1j7HpMwl0+KRvMkPyjGMMfY7uPpWbp3xD1Cy8UJDqge5tr77HAiq4AhklRiSBjkcVsw/C/Pii+v73WLifTrwMJNN58twQBhgSQenWtZ/hv4beaGU2bBoGjeLErDYYwQhHPbJ/OqcqS2CzM7xd8R08J6heQSabJdJaWq3MjpKF+UttwBjrTLb4nxXNrC66bIJ55JEjh8wfNsUN16ZOa3dZ8DaHr91LcapbvM80Yik/eEBlByBge9Qj4c+G/ssVu1kXjiuBcrvkYkOPfPT271KdJrYNTCufitDA94g0yV3tVnJXzQMmJ1UjPvvBqR/iasKw/adLmjZ782TkSBljbAIJIHQ7q2Ln4a+F7maaV9NQSTtI0jISpYuQWyR7ipYvAmhwurCCRgJvPKvKzBn9SCeeg/KnJ0l0FqYvxF1jVdIm8MSaZfNbxXetQWtxGqg+YjBicn8MVV8aeMbmz1rw+uizzBW1AwXULIY1lG0nGWHt1FdhrfhfTfEDWh1ON5Pscomg2yFdjjo3B6j1pdb8MaX4hSEarB5vkMXiIYqUYjGQR3xUKUFa4zzGX4p3Z8RSNZJcbJ2sYlt5mXy4vNbDMMDOeK9hjJKqW6kZOK55/h/4ckvmupNORpGSNCCTjCEFeOnGK6NUVFCrwAMAelKpKDXujVzG8Va7a+HNHfU76V44YWUsVUsSM9MCvNL/APaK0SB9un6bd3QOPnZgmDnpjmvWNStxdRJC0QkVnBYMARj3zXO6h8LPCGqRKs+iWkZD+ZugjEZJ9yuCRz0pRslqJ3KFj8ZPBk1nFNcaqIJZEDPE0bkoccjOKs/8Li8D/wDQbT/v0/8AhXTw6HplvCkMVhbLHGoVVEQ4A7U86Rp5Uj7Fbj/tkKl2HqVfD/ijSPFNrJc6Hd/aoo22swRlwfxArXqC2tYrVSkESRqeyLip6kYUUUUAFFFFABRRRQAUUUUAFFFFABSjpSUo6VcNxMWiiithCHpSUpPFN3fnWM9xoWikz+dJu9agY6ikzRmgBaKSigBaKQnFND5bGPp70AOoNG6kzQBleJ7iWz8Nahc27bZYrd3VsZwQOK1IiWt4yepUE/lWX4mt5rvw3f2tum+WeB0RcgZJBrTiGIIx3Cj+VV9nUQ8UtJRUjFopKKAFopKKAFxSY4ooprcRxlxeazc/Dq7uNKMj6gJbhI2jUb8LO6jA6ZCivMtCs/HOhaTqI0uw1SKe5v5JsmFcuvy4Y+/XivaPDVtNY6IsFym1/tFw/Bzw0zsP0YVrA5rb2ijpYVjya6i8XWWqa7dafDqRe7u7cx7UBBjFtz9MNxx3ArpNB0rUfE/gLTY/Fpu4NRicSSsQEfep46cYxXbbhRkVMqt1sFjzXU/Cs1j8Q/BMlhb3Fxa2C3Uc9yRnYrRMEDH0ycCum0DwTpPhq8NzpduY5TD5JPHKlix/U10lFJ1G1YdhccUUZpNwrMY6kpNwzilzTAMUtN3Zpc0hC0UmRRmgYtFJuFJuFFwF70UZo3UALSGjcKbvycd6BFa/ZkSMpnmQDjvVpRhQPaqt7ufylRC37wMSOwFW85qnawwx60YoyaKkCrqGo2ul232i+nWGLcF3N3J4AqHTdb0/VYEm0+7jnjkLBSp67eD+VZnjfRU17QhZTW9xPH5iyYtpNkisvKspyOhx3rz2z8CeJ4l+13qJdXa2ckUTLcGFgxfK7ivQ7epGa2jCLjqybnsm7IqKO8t5ZpYY5laSEgSKDyuema8at/Afin+w7Gyu/PyutRXc/lXZ3CDyArqG6n5wfr1rrvCvg2fRNS8UCaMC3vpUFoWlLExiPbg9+tDpxXULs7e3uobqFZbaRZI26MpyDTmnjSREZ1V3yFUnlseleMWngXxfZXukiHCW9vDEqKk/EEouEd3YdwUDDv1xXW+M/Cl/rXiXTNQtAskFrZ3MTr5pU+Y64Rh+NDpxva4XZ3m8Uu8V4jqXw88UN4E0q00kTLqyqzXkst6xw4K42845AP8Ak1q2nhTxDF4ilvxFcp593IZCLgEeU0AXpnGfMyar2Ue4XPWd3pVS/wBUtNNNuL2dYftUy28O7+ORs4Ue5wa8auPh/wCLZdG0q3YPI9u1wZX+0bWZWQhMjPXdg08eA/FU91Asschtk1WxuwJbjdtVImWY/UsRR7KK6hc9phuIp0DwyLIuSuVPcHB/UVIWA615ufCGoQfDGXR4LbZfvPuby5sFv3hOd2ePlrBuvBni147Kzhe6i0uO9uGmijuAZTE4GwjJ5IOe/Hakqa7hc9leQRozOdqqMknsKWCaOeFZIXDxuMqyngivKYfBmqxa3qKpbzS2NzpnkAz3O4/agMGTr0YenftXoXhTT5NK8K6bYzRiOWCBUdQ2cEDnmhQUeoXNiiiiqAZKCYzg4PtXC+J7rW9J8YaFdRahMuj3Mxt7uHC7UYg7WyRnHau8PQ1m61o9rrumPY3yloZMEgHByDng9ulRdKQzkNS1fUfDlnp7y31zeS65qsdhCZwoFqshbDgBRkgDoaseItU1TwnYDUJb2S8tFjEWJVG4zO6hScDpye1dDq3h6z1ixgtrtTstpo54WU4aN0OVYH1p13oVtqFjLa3paeORNpDnt6/X3pc0bqwGRcDVdKeyvLjWTLaCXdeiSJRhSpAC45A3Ecc1tHVrVftQecD7KA0vX5QRkUW2kR2/kAzzSrAMIJHz2xz6/jWhsXn5Rz1461LavqBmSa3YxrIz3ICxRiVzg8KehobXLKOe4hkuFD28Qmcc8JgHd+taZRf7o9OlGxcklRkjB4pXiBj3viGxs7OaZ7j/AFUPnkYP3T0P4151e+Kp7ycz/wBoSJvjMgSJ2Vdo74r1me2iuIXikRWR12kY7Vy8vgG0aYtFcyRp2XAOKmVnsBxMWvTyEL/adyWMXm/65vu+vWiLxLOjRyR6pcE7PNAMrEMAe/PSu0/4QC3xxeSf98iuc17RF0W5RFdpEkXIZlxz6Vk4pagbM/jW3u/BlzeQXCpci3mdBjPKDOeR6c10dvrtnNDblZ1ImhMqHn5lXqa8yFy9vp99BDEZTdWzQBVHJJ6YHrmvXoEUW8QKAYQDp04raMoyjcCjBrdjcfZ/JuQwuQxi6/Pt+9+VA1mzeO3lWcFLpikJ5+Yjt+laOxRjCgY6cdKXYuB8o46cdKd4gZ0es2UrQrHchmndo4+D8zDqKSPWbKSK3lS5BjuZDFE3PzMCeP0NaWxePlHHTijYvHyrxyOOlHugZZ17TgkZ+1DEkphQ4PLg4xTm1mzDACcf6/7Oev8ArMdK0di8fKvXPSl2L/dHXPTvReIGW2u2EahmuhgzGAZB5kHaibXrCBHkmuVRI5vIcnPD+lanlp/cXrnp3pNiHOVX16U01cDhl8Zx23heaaSdJLuO8mgIIxtPnOFHH+yBXLSeI5yZGfUZ1bzArKJWAUntTpLieSA28q7Iobm4KDGNwaZ2De+QRj2NamgeHxrTuzyGKOMgZA5JrGpJOVgMl9fuI2mD6ncL5RUN++bjd070suvTQtIr6ncBo1DsDM3AP412n/Cv7Yk/6ZJ/3yKD8P7Yn/j8k/75FTygcQ/iKePzTJqdwqxKrMfObjPTvTpPEUkck6f2pcBoV3OPOfgfnXa/8K/tu95J/wB8ij/hX9t/z+Sf98ijkuBxLeIJxM0Z1O4BSPzGzM3C469aVvEEir/yE7j/AFPm/wCtb7vr1rtf+Ff2/wDz+S/98ij/AIV/bf8AP5L/AN8ijlQHEL4hmMuz+0rgHy/MP75/u+vWpV12Z5ERdSuCzR+YAJm5Hr1rsv8AhX9t/wA/kn/fIo/4V/b8f6ZJ/wB8ijlQziE8QzSiNl1O4IdSwPnN8wH40+PXppZI1j1O5LSR71AmbkevWu0/4V/bf8/kn/fIo/4V/bf8/kn/AHyKfKgOJi8QXEzQCPU7hhMCVxM3zY696cniCV/L26pcHzHKriZuSPxrtP8AhX9t/wA/kn/fIo/4V/bdryT/AL5FLlv3EcSniGeQxbNTuP3u7b++fnHXvSp4hklWJo9UuGEjFVxM3JHbrXa/8K/tv+fyT/vkUf8ACv7b/n8k/wC+RRyoZw6+JJnjDJqlwQ0oiB85vvenWpP+EglO0DVLjmUxj963LDt1rtP+Ff2w6Xkn/fIo/wCFf23/AD+Sf98ijlv3EcSPEE7xq66ncbWl8sHzn5Pp1qQeIZ40eZdUn/dSbCfNY4bOMda7I+ALbH/H5J/3yK5zXtBbRZ0AYywy5AcjoRSa5VcNTptN8WQ3+lLLPIsU63CwSLyfmP8AjWvNrunwRyPLchVjm+ztweJOu2uE8OXf2fUkicL5c0i7tx6EHrXpoVWH3VIJz0reMouNwKDavaRR3LS3AC2jBZjz8hPSmya5ZQ+d5twF+zqrScH5Q33a09inOVHPXjrQUU5yoOevFO6A5rxj4obwposepGHz42uYomBJGFZsEjAOSPSsDUPi1o9tFcX0DGfTobPzzKgbfu37du3HrXW+J/DsXiXS0sp5WhCTJMroOQynIrj5fg1pMtjc2Qvbhbe5gaGReM5Z95bP17VrT9nb3ham0PHmnReC9P8AEF8Ht11FEMMWwlmdl3BQAMnoefbNVPDnxI07V9D0i61Ffsd1qa/LCgLqh3EAFscZ296uX/gG0vvDOj6R9qlj/scxtbTDGcohQEjoeCay7T4VabZ22mQ/brhjpwURE4AO1i3I/GnH2dtQ1LVh8TdDutJivrmRraOe4khi3Rsc7JNm48cDJXJ7ZrtUCsoPX3rgn+E+lyaNb6b9ruBDbmYpgjrJIHz+BFd5EnlxKnXaAM+tRNR+yMftFJgUtJms7MYbR6UuBSfhS5o1AQKvYAfQUYFLSFgOtOzEGB6U5RgUgOcU4dKcNwFooorYQhpuBTzTaxnuNBikxS4oxUjCiiikAUUUUAFFFFABisrXtMGo6TLCqgyAZjz2I/zitWmSLuGKN0B4pdXUml2s11DzLbqXBK9x6ivUPDGsnVdMj3k+bEoWTI68cGuW+I/h5zY3F1YqzyXKGMxgZ+bbx/KqfhnUf7N1WJnB2SDy2A9//r1CShGzDqepUtMjYMuRTqsBaKSigBaKSloASue8T64dMs3iik23Un+rCjkDPJ/pW7cSiGIu3QAkn0ryvW9SfU9Wln3Ex52x5GML2qJSsBmWNzPqqI+xWlZ3hCoPvBHKD9FFeuaNp8en6ZFAiBWwC/TJbv0rhfhvoLeU9zfW5Xy5ZGjDepkZgR+BH516Qo2riq5bSYlsOooopjCiiigAooooAKKKKACiiigAooooAKKKKACiiigArM17TV1LR5oMlWxlSoycjmtOmSqXjIBwaLXA8bYvA2RuV1bAHcGvTvDWp/2npMbsxMkf7uTIxyB1rlPHGk/ZrqO8jxtmYBgB0I71V8Laqmk6v++YiGYbGxzg54P8/wA6hWhFID06jFNVt1LVgLikAoozjrTQCN6jivLfED6l45+Iw0PRtVv7DStLQ/2jPZSeWTIeVUN349jTvjl4q1Hw74XsBod89neXF4FJTG5kCNng9s4q/wDCPTLyw8GRyatZfZr26kaaVj9+bJ+8/ofavRhQdHD/AFl210X+Zm3d2Hf8KoiP/M5+L/8AwZj/AOIo/wCFURf9Dl4u/wDBmP8A4ivQMUYrk+s1e5XKjgP+FURf9Dl4v/8ABmP/AIik/wCFTxnp4z8Xf+DMf/EV6BijFH1mr3DlRwH/AAqiL/ocvF3/AIMx/wDEUf8ACqIv+hy8Xf8AgzH/AMRXf4oo+s1e4cqOA/4VRFn/AJHLxd/4Mx/8RSN8K4wpx4v8WEnudTH/AMRXoFGKPrFVrcdkVtPtRY6bbWqyzTCCJY/NnfdI+BjLHuT3PrVsdKbinDpUQd5ALRRRWohD0pM0kp/dnnFedW2qSya54on8QNdfZ9HmQ2cUTMpEWzJYBSN/Oeuahq7A9GznvSZrzWeO+1jwnpd94V1a7jvod08JuVI+2KqkiN1JxhuOetcdruqtqGg6pqCPf6dqEN3ZRTwfbJR5MjuwlUDdjB+nTpTVO4XPe80VxGk3F1ZfEBtGsmkm0z7AsziSUv5EhY4+Y5J3DnBPaujkstUaMKmpxqfOL5Ntn932TG7r/tfpUSjYZq0VmmzvwX2X6DdKGXMGdqd1+9z9f0oNrqB6X6f68P8A6j/ln3T73X/a/SpsBpUlZZsdTxLt1OPLShkP2b7if3fvc/Xj6VJNa6jJ5/k38cYfb5QMG7y8fez8w3Z/DFHKBo0lZ0lnqB83y9QRNzKY82+dgHUfe5z+lElrqDpcBL+NGdgYSYM+WO4PzfN9eKLAQ+KJWt/Dd/cpGsj28LSor9CyjIrzB1ZHKuMMDg/WvQPFdnfyaFrBW8DRS2brFAIfmVtvXOec4PGK5/xR4c1ASLeWpDK8Kh9sWdrjq2M96ipC6uBt6J4usU0uJNRuNlwvysBG3PofyrQ/4TDRv+fv/wAht/hXmD6fft5uxnGQNmYCdh7k885py2N8D828jZjAhP3vXr09v1rO8u4z03/hMNF/5+//ACG3+FH/AAmGjf8AP3/5Db/CvMRYahxu38RkHEB5b169Pb9aPsGobcZYHy8Z8g/e/vdent+tClID07/hMNF/5+z/AN+2/wAKT/hMNG/5+/8AyG3+FeZnT78sv39oTBHkk5b169PakisNQVYxLubbneRARu9O/GPxzRzS7iO61/xbZy6a0WmzGSVztP7tvlB61xMMck8yxQIXcnAUDOaiFhfgpvLthSGxAfmPr14+ldV4Q8M3y3MOo3dxsEQIETQ4MhIxuBzx16c1PK5y1Y7nSeEJXm8PQtMqh0eWFivQ+XIyZ59QoNbtct4Ws71NBtla5Ebpd3LShof9YPPk6DPy9c55rXjtNQUx+ZqEbbXYvi3xvXsPvcY9e9dTSvYRpUlZ0Vpfr9n86/STyy5lAg2+aD93+L5cfjn2pn2PVQiganHkSlmP2bqn9z73X3/Sly+YGrRWb9kv92TfoP3+/Hkf8s/7n3uv+1+lAtdQG3N+hAl3N+46p/c+919/0osBo0tZSWWp7GEmpxsTMHBFtjCd0+919/0p72uos0xjv0QO6mIeRnywOoPzfNn8Me9HKBpUVnPaX779t+i5kVl/cZ2qOq/e5z6/pTWtNSK3QTUYwZGBg/0f/UjPIPzfNkd+KLAaVLWdPaX8rS+VfpErIBGDBu2N3Oc8/Timy2mplZhFqEaMwURn7PnYR1J+bnPp2o5QuaVFZ8tpfSLchL5E8wAQnyc+Ucc/xfNn8KabTURIxXUUCeTsVfs/R8ffzu/T9aLeYzTpKzmtNQI41FAfJCZ+z/8ALT+/97p7frSPaaiQ/l6hGpMQVf8AR87X7t97nPp+tHKI06KoR218JIzLeo6iHa4EON0n9/OeB7frUcdnqKLCG1CNyqFZD9nxvbs33uMenOaLDNOkrOW01H5d2oIf3JU/6P1fs/3ug9P1pwtr5fs3+mp+7QrN+5/1rY4I5+XnnHNFgK3iS1+26U0C7fMZgELdjmvMpEeKRo2GHUkEEYwa9JubbUkjtEm1FJWWbMm22xvHYfe4x681yHiTw5qFrfi7jk+0RyFnmZYcZYnjjPH65rKrC6uI6TS/GGn/ANnxC/uAlwFw4Ebdfyq5/wAJho3/AD9/+Q2/wrzAWGo7oss2Fz5g8gjf9OeP1pVsNQEaAly4kyzeQeV9Ov61N5LqB6d/wmGjf8/Z/wC/bf4Uh8XaKwwbs/8Aftv8K82js7wbvNjd8sSuIyMD09/rT/stx/z7y/8AfBqXUltYZ0HiSz8I+KdX0y/1O7lc6azFIijbHyQfm49QK6NPFWhqB/pR/wC/Tf4V559luP8AnhJ/3waPstx/zwk/74NVKvUklF7ILHpC+LdHeRVW7A3HHzIwA/EjitaGdJ4w8bKykZDKcgivIPs1wP8AlhJ/3wa7bwVZXNpDcNcwtEJGUqGHXg80Rm27AddRSUtagFFFFABRRRQAUo6UlKOlXDcTFooorYQ1hlarNY2zszSQo5bhiy5zSanf2+laZPe3r+XBAheRsZwBXOP8QNIikRZhcAyXCWyER5DOwyMHoR71DjJvQDoxp9qrIRCgKDC4GNv0pk+k2Fzu+0WkMm9gzbkB3EdCfWsDTviFoOqaxd6Vayzfb7PJkgeIqSAQCVzw3JHSpbbxtpuoXl9Bpq3F3/Z0vk3bxREiN/7v+13zjOKXLNDN+G0ggbdDEiMepA5NT1kWGv2ep6tfabbeZ9osNvnApgDcMjB71nWfjrSdQup4LX7Q7wXrWMn7o/JKpAPHpkj5ulTyS6hc6jFFc3r/AIz0rw1f2dnqbSia8DGIJGWB2jJ5+gqPT/Hui6pqsFhYyTyT3Fkb+MeUQDEDtJye+TjFHs5b2C51FFcvdeNtMtZFX97I5WN2RU+ZQ5wpx1/wrp1ORmk4tbgLig8UtIeakZm6/enT9DvL1FDPBA0gB74Fct4r8a3Wh+INM09Uiit7xAftE8beWWLAbN44UkE4z1rovFo3+ENUReWNpIAB9Kpax4Tt9e+zy3d3dLGgjZrdHHlyFSCMgg8+45rWHLb3iTHk+KWkWdrfXF9Z3sEFpcNAZDACCVHzHOcDB9evGM1LP8UtCS/eyt7bULudLZbo+Ra7lWJl3KxOeBj1o1f4W6Fq5lW4lvkimllmaGK5ZU3Ou1jj8c//AFqsaR8O9J0a+ubuGW5d7qwTT5BJJkeUqgADjrx1rT91uGpG3j6JfANj4m/s+dlvGjVIEUE/O4UHr71paZ4x0rV9UNjZ+b5hWQxuyAJN5bbXCHPOGOD9KYfBeljwjbeHQ84sLcoY2EpDrsYMp3fUUaV4M03RtZ/tC1eU4WQQQOQUg8xgz7eM5ZueSepqP3dvMNTDT4taQIbye5sb5IYL42KeXCHMsg4wADnk8Vof8LH0ZdUj0+eC+gu5bdp0hlttrEKm8jBOchT+eRmoJPhhozMTHLdxqdQGoGJZBtEoOehHAzUmpfDbSNU8VS+I5Li8TUJFZN0c2FQGLyyAD7c/WrXsmw1IG+K3hoWaXEwu4w7oipJAFZt4ypGTjBx611tjqtlqMbfYLuGdo8CREcM0Z9GAPB9jXGS/CTR7mNI5r2+liVI0MbshVlQYUEFew79a7PTtHsNLQrp1nDbl8b3jjCs+BjLEdT7mokqfQNSLw/fHUtLFw6BT500eB6JKyA/+O1qYrD8IAp4eVWBB+1XRwf8Ar4krczWcrXKFoooqQDFJilooAKKKKAExRilooATFLRRQAmKMUtFABiiiigBMUYpaKAExQaWkNAFW8kaHYyY5cKfxqwqhgM5qtfn5Iv8Arqv86uVT2EN2L6D8qNi+g/KnUVIxuxfQflRsHoKdRQA3YvoPyo2L6D8qdRQA3YvoPyo2inUUAFFFFABRRRQAUUUUAFKOlJSjpVw3ExaKKK2EZ2u2c2oaJdWtsYhJMm0ecu5PfI9K84tvhRc2CQwafexx2cGpJew27szCJQOUB9ya9D8S3N5Z+HL240tY3vEiJhWRwqs/YEkivJv+E01udLMW+sXsNwdRjs7u1uLeMSQFhkqTswfYjtVx5vsidjsLzwBHqC6bdyvHb6rp9+LlbmAY3x79zRt6grxVOHwDrWlQazb6FrKWsepakL5JQh3xAtmRD656CqOl+KNR1bwjqHiXVdfk0iKGaWCOGG3V0j2EqrP8rMckDPTrVa58X69petyte6hI2g3Uywx3iW48y1lKqyLjb91t2ORxjrStU2uGh1dj4Z1jTdf1jULK7t/+Ji0G0yKWZAmA2fUkZrM0LwBqugaprOo6fd2gvNUv55nmIY7IZGDbQP7wIPPvU2rePm0z4k6R4d/dm1uUaO4mY4ZZSu5f8Pqam8Ea1qGpav4pGo6g0sOnarJawIyoFWMAEcgZJ565pe/ZsNDN8V/DCbX9T0uY6gbq3svMMiXzFmk3KQACuMAVLo/w91PR9X0/VE1GG5urbSX02TzEIBDOGVh9MYr0VcMoPWnY9qz9tO1irI84134b3Os3lhdC7hgu9PEKwXUQKuFXG9TjqGxx6V6CsqphXcA46k4qYj2rl/EHgHRvE+oLdatFOzomxTHcOnH0BqHLm3A6Tzov+eqf99CsvV/FGk6FHC+q30FsJn2Jvf7xrnP+FO+FB/ywvP8AwNk/+KrL1b4FeGtTRFSXULTYc5S4359vnz+lTZBqdTeeNNCTT7i5t9Rs7l4YywjiukLOR/COa5b4g+P9W8Na/p1hpZtVjuYVkczrkjLhcfrn8Kyrz4G+GfD+k32oxTX9zPBbs8SzyrgOBkHCqPSvRL/UdDsmgh1LyjMLYzBWiLt5aDk9D+XetotJ3tcWtjy3V/HGtT/YLqC5hbUrZNUVTDkxsYkBUlAfmyo49+a7sXtxdfCKK91G/MV1LpizNPG3lkuY8/nk0N458F2thbX0zi3hnMgiaSxkU8FVY425A+YDPfNdUr2FxaqimCSFlG1cggjHHFVJ7e7YDyrWPEWp/wDCojaQ6ZfyB9KWQaoko2q2M9Qc5yMVW1bxdrM0mn2zPGZbXVEigu4CRHcZgL9M/MFJ2keteqSanpUF9baPI8SvdK3kxBDscLyQD0yOuKvrYWoVFFtEBGcoNg+U+oo9olugscdF4h1Sz+GkesXBjur50QkohCxliASR/s5JP0rgbjx7q/hbSb02d1bahczajM3RmVkWNG+XnheTXuYgi8sx+WvlkYK7ePyqEaZZAACzgx0/1YqY1IrdBZnkt78Rtd06xvdRaa3be0Qt7fyjkBog/Hr1616X4R1eXX/CGmarcRrHLd2yyui9FJHStFrC1YANbRHGMZQcY6VLHEsaKkahEUYCqMAUpSUtkBz1n4y0U2Zku9QtLSRZZImimuFDAo7L0z325/Gr2keJdK12B5tIvobqKN9jMjdCO1eYQfBPw/4pjm1W7ub+3uJ7m53rDIu0kTyAHDA9gO9bGkfAvwzpkDRySahdbm3bnuCmPwTFTJK4anpPnRf89U/76FJ56sxCMrfQ1xJ+DvhM/wDLC8/8DZf8a1PD/gPR/C989zpEU6vIm1jJcO/H0Y1FkM6cUtIKWkMKKKKACiiigAooooAKKKKACiiigAooooAKQ0tIaAKt5L5CxuBklgv51ZXoD7VVvyPLiz181e3vVsc9OlU/hELRRRUjCiiigAooooAKKKKACiiigAooooAKKKKAClHSkpR0q4biYtFFFbCKmo6fbapp8tlfRCa3mXa6EkZH4ViyeA/Dk3l+dpocxy+crGaTdv6bid2SfrXSGkrKUmnoM5258CeHLu6nuZtNUy3OPP2yOokx03KDg9PSrUfhbSIorqNLNdl5IJZ1Z2YOw6HBPH4YrYoqeZgc9deB9AvbVrW7sTLA032gxtNJjzP733qhX4e+Gkadl05gbiTzZsXMuJG9SN2DXSl1U4LAH60uaOdhYRV2gAdBTqKKkYUUUUAFFGaKNQI5IxIOcg+orh/EHh+bUvF0omsFvrG908wMJWKxqVcHaSOeR/Ku8puB6VUZOLEeP698G5b3T4rPQ547S1UTIIJnZhCsjRnCnr1Q/nVaH4O6rZ6wJILm2ktEvVuAuSrFBEUI+vOa9pwPSggela+3nawrI8q0XwXqmg3uj6aVEsEOpteLNGP9REImUKx7kk16sv3RSbRnpS9KzlJy3GhaKKKgYUnalooERxx7BjOT61IKKKNRhRRRQAUUUUAFFFFABRRRQAUUUUAFFFFABRRRQAUUUUAFFFFAEbx7iD3FPFLRQAUUUUAFFJuBOM0uc0AFFFFABRRRQAUUUUAFFFFABRRRQAUo6UlKOlXDcTFooorYQh6UlKelJWU9xoKQ0tJWYzhfijqOp6dpGmJot81hPealDbGdY1cqrEjowxUQ8EeMyMj4k3aj/sGQ0nxa/wCPDw7/ANhy2/8AQq77otdvtJU6UWut+iJ3Zwf/AAhHjT/opd5/4LIaP+EI8af9FLvP/BZDWwnjfTJfEFzpEbMbq1mEMqEgEEru3AE5K471asfFui3cEDtqNtDJPjbDJOm/J6DAPftS9tVXRfchWRzv/CEeNP8Aopd5/wCCyGj/AIQjxp/0Uu8/8FkNdUviXQ5Edk1exYR8MRcL8vOPX14qs/ivTBrOm6bFN9ok1IyiF4SGQGMZYE9qXtqvb8F/kOyOe/4Qjxp/0Uu8/wDBZDR/whHjT/opd5/4LIa6Ow8S2uo6/qWkQrILnTdpmLDCncMjBpkfjHRApN5qVtZHeyhbmdFLbTgkc9M0e2q9vwX+QrI5/wD4Qjxp/wBFLvP/AAWQ0f8ACD+NP+il3n/gshrr5db0qGZ4ptRtUkjXc6NMoKjGeRn05+lWbe6gu4RLazJNGTgMjZFJ4iou33L/ACHyo4f/AIQjxoP+al3n/gsho/4Qjxp/0Uu8/wDBZDXfYoxS+s1PL7kHKcD/AMIR4z/6KXef+CyGj/hCPGn/AEUq8/8ABZDXfYoxR9ZqeX3IOU4H/hCPGn/RSrz/AMFkNH/CEeNP+ilXn/gshrvsUYo+s1PL7kHKjgf+EI8af9FLvP8AwWQ0f8IR40/6KVef+CyGu+xRij6zU8vuQcqOB/4Qjxn/ANFKvP8AwWQ0f8IR40/6KVef+CyGu+xRij6zU8vuQcpwP/CEeNP+ilXn/gsho/4Qjxp/0Uq8/wDBZDXfYFGBR9ZqeX3IOU4H/hCPGn/RSrz/AMFkNH/CEeNP+ilXn/gshrvsUYo+s1PL7kHKcD/whHjT/opV5/4LIaP+EI8af9FKvP8AwWQ132KMUfWanl9yDlOB/wCEI8af9FKvP/BZDR/whHjT/opV5/4LIa77FGKPrNTy+5BynA/8IR40/wCilXn/AILIaP8AhCPGn/RSrz/wWQ132KMUfWanl9yDlOB/4Qjxp/0Uq8/8FkNH/CEeNP8AopV5/wCCyGu+xRij6zU8vuQcpwP/AAhHjT/opV5/4LIaP+EI8af9FKvP/BZDXfYoxR9ZqeX3IOU4H/hCPGn/AEUq8/8ABZDR/wAIR40/6KVef+CyGu+xRij6zU8vuQcpwP8AwhHjT/opV5/4LIaP+EI8af8ARSrz/wAFkNd9ijFH1mp5fcg5Tgf+EI8af9FKvP8AwWQ0f8IR40/6KVef+CyGu+xRij6zU8vuQcpwP/CE+NP+ilXn/gsho/4Qjxp1/wCFlXh9v7MhrvsUULE1PL7l/kHKebfCjW9Y1PVPFWna5qLah/ZN+LaKVo1QkAuCcKB12ivSV4HFeVfB/wD5HD4hZ/6DJ/8AQ5K9VFGKsqrt5fkEdhaKKK5igooooAKKKKACiiigAooooAKUdKSlHSrhuJi0UUVsIQ9KSlPSkrKe40FJ3paTvWXUZ5/8Wv8Ajw8O/wDYctv/AEKu/wAZUVwHxa/48fDv/Yctv/Qq74nCiuqp/Bj8yep5/qXgfUL3xiNXa3012iuDNDdgsk6psI8o4HIJPXPHoa88tPB+s6F48060ufDo1KGJrcfa4ZHSNXBOJD8pDbQx4yOld7e+MNZT4h3uhQsFtlaLZcGLKQggs2859sCrknxJtoLjXreXTpftGhx+bOnmLmRcDaV9iD+FXF1I6bi0ZzEvwq1+400WaXOnwjyypl2lySZvMzggfTOa2tC+Her6V4g0a7ub60uIdOuLqVtkbKzCZccZJ6EetM034nyaxr0Vva2j2yW7zpdwSYYsUj3rtYHHanQfGKzuA6Q6VcPOksEXliResoJXn2280n7XawaFlfDHimx8Xa7q2mSaeF1UxqvmO26JU4z05JHauT134O+INZlLtdaeDsmQbix+++7PTtW/cfGmxtxpjPpVxjUEUj94vyEuyY/NevvWbd/GGfT7+zm1C2aGzdbh2jjUMXEZIAzng5FOPtVsGhoXfwz1OfxFq160mnXFrqFrHiC4jLFJki8vAPZSM5OM9q7DwboFx4c8NwWF3cec6Fj94sEBPCgnkgDjJrm9R+LVpp19JYtps8t3HdW9uUV1APnRGRWz7AYNdLofif8Atv7C8Fm6QXlp9oEhcfIc42kdSfes5+0a1Hob4paQUtc5QUUUhOKAClrO1DW9N0yRUvr+2tmYZCzSqpP5mq48WeH8c63p4/7eE/xosxXNmisf/hK/D/8A0HNP/wDAhP8AGj/hK/D/AP0HNP8A/Alf8admF0bFFY//AAlfh/8A6Dmn/wDgSv8AjR/wlnh//oOaf/4EL/jRZhdGxRWP/wAJX4f/AOg5p/8A4EL/AI06HxHpF3P5NpqtlNIeipOpJ/DNFmFzWopAcilpDCiiigAooooAKKKKACisLWfFFnpFwIXDSy90T+H61n/8J/af8+c35ip5kgOtork/+E/s/wDnzm/MUn/Cf2n/AD5zfmKOePcDraK5L/hP7T/nzm/MUf8ACf2n/PnN+Yo549wOtork/wDhP7T/AJ85vzFJF48tJJNslvJEv984OPwo5ogdbRUFrcLcwiWNg6NyrDvU9UAUUUU1uB5V8H/+Rw+If/YZP/ocleqDpXlXwf8A+Rx+If8A2GT/AOhyV6qvSujFfxfu/JExFooormKCiiigAooooAKKKKACiiigApR0pKUdKuG4mLRRRWwhD0pKU9KSsp7jQUnelpO9ZdRnn/xZ/wCPHw7/ANhy2/8AQq77GVrgfi1/x4eHf+w5bf8AoVd+Pu101P4MfmT1Mm48L6Rc3FzPNZRvJdgCdj/y0A6A1mav8P8ARtRtL9YLWO1ur63NtJdIuX2EgkZ78iuqpay55LqOxzln4G0CzjURaZbiTadzhMFiwwxP1FJbeAPC9n/x66LaRHcj/KmOUztP4ZNdJRR7SXcLHMP8PPCskkMj6HZs8AAiYpygDFhj8STUj+BfDcsgeXRrNmXftJjHG77355ro6TFHPLuFjn5PBPh6WQvNpVvI/mpMZGXLb0Xapz7A4HtV+y0HTtPlgeztI4Wt4vJi2j7iZztHtWjilpc7CwUUUVIwprDKkU6igDyPx78F5vGPiRtUj1swBkCmOWMybcenIwK5f/hmy7/6GKHH/Xqf/iq9v8RC5OgXa2Fwba6aMrDMAMox4B59zXlOleK/FTy+GrPVbm5hu4dSksdRPloFuzh2XHHZVU8Y+9W8IyktCGkY3/DNd1j/AJGKH/wFP/xVA/Zsuv8AoYof/AU//FV2/hzVNS8Q6Bqd1f67JYXkOrywIPlUJGjgLHtx3Hfrz1q34K1y81LR4hqmoyPenVZoCpKhiqlvlwB2AzT5WrhZHn3/AAzXdf8AQxw/+Ap/+KpB+zXdED/ioof/AAFP/wAVXb+N/EGt6P4mY2krzaatqnmx2pHm2jluJmB+8uBisrRfiXqcklxbWenz6hM13IqtNINoCsBsXauc855/On7ObV0K0Tn/APhmm7/6GKH/AMBT/wDFVf0P9n240jXLK+l8Qq620yylIoNpbBzjOa6if4p3Fl4tk0e+0+JEUzr5wnxgxQpLzkcDD4rm9V+K2parDpw01hYy/wBp28crQMHEsUh6cj9RR7ObCyPbhS00cU6uc0CiiikAUUUUAFFFFAHAeI/DupXWv3Fza23mxyYIIYdcAY5PtWZ/wi+tf8+D/wDfa/41f8S6t4hXx1LpejanFbJ/ZzXSLPCGUOpAwT1xXNW3xK1zUryweMywxS2Fy8sUMAcmWI7dy8fdJ5qvqrlqK6Nb/hF9a/58H/77X/Gj/hF9a/58H/77X/Gql54n8VRfDHTPEiatGJboW4ZPs69ZZApPToAePfNdD4n1nX/DXhuz3O99dPMwuJrSJTIsQydyoeCRxmpeF6Bcyf8AhF9b/wCge/8A32v+NH/CL61/z4P/AN9r/jVTRvilJ9vjkutQ/tGzi0u4u5hb24ViyyqqgjswBwR05q/qHxp0/TY0km0fUHV/NIKFCCI8bj16c0PCSC6I/wDhFta/6B7/APfa/wCNH/CLa0eunt+Lr/jV/WvidbwwXtnZQzw339mzXVvI6rtBWLeMj8a6rwpfT6t4N0bULxg093YwzykDALMgY8fU1Lw7irsLj/DlhLpujx29wf3gJZucgZ7CtakAx0paaVhhRRRVLcDyn4P/API4/EP/ALDJ/wDQ5K9VXpXlXwf/AORx+If/AGGT/wChyV6qvSujFfxfu/JExFooormKCiiigAooooAKKKKACiiigApR0pKUdKuG4mLRRRWwhD0pKU9KSsp7jQUnelpP4qy6jPP/AItf8eHh3/sOW3/oVd+vSuA+LP8Ax4+Hf+w5bf8AoVd+vSump/Bh8yVuOFFJS1zlBRRRQAUUUUAFFFFABRRRQAUUUUAVb6wg1G38i6j8yPOSuSOR0qneeHNM1CS3ku7ON5LaTzIm5BVsDn68CtaiqUmgMdfDGlLqTXy2MQuGO5mA6n1x0z70tv4Z0q01OTUbeyiS6lYs0g/vHqfYmteijmYjIu/DWl3+pC/u7RJLkKE8w9wDkA+oz61zOt/CnSdTvYrizkk0wrvLC1O0s7HJfI78fSu9opqckFjnI/A+h+b58+nwzXJDBpn5Ziy7WJ+oGDSL4D8No0bJo1qhjKsm1MYK/dP4V0eKWjnl3Cwg96WiioGFFFFABRRRQAUlLRQBy2u+BLDX9XfULq5u4pWgNufJl2jyz1HHrioB8OdIS6tp7czQG1tXtI1jfgI33vqT1zXYUVp7SS6iscnL8P8ATZfCdr4eea4Nlaujxjf83ysGUZ9iK0tc8Ox621nI9zPby2bl43hbBJIwc+oraopczvcdjzy++FlnDp902gytBqEtnJaiV2+UiRwzMcd8iqlr8JY9R0m3t/E93JPJbrJHD5LBdqSY3KSAAeR1xXpuKXFV7WYrHDXHwq0S4meZpLrzHiaEnzj9xo9hH5V1mk6bFo+j2em2u7yLOBII9xydqqFGfwFXaKlzlLcLBRRRUDCiiimtwPKfg/8A8jj8Q/8AsMn/ANDkr1VeleVfCD/kcPiH/wBhk/8AocleqjpXRiv4v3fkiYi0UUVzFBRRRQAUUUUAFFFFABRRRQAUo6UlKOlXDcTFooorYQh6UlKelJWU9xoKTvS0h7Vl5jOA+LX/AB4+Hf8AsOW3/oVd+OlcN8UNN1TU9J006LYG/ns9RhujAsixllU5PLHFRDxr44GcfDS4Ye2rQV3ezdSlHle1+qIvZnfUVwX/AAm3jj/omdz/AODeD/Cj/hNvHH/RM7n/AMG8H+FZ/Vp9196/zDmR3tFcF/wm3jn/AKJlc/8Ag3g/wo/4Tbxx/wBEzuf/AAbwf4UfVp9196/zDmR3tFcF/wAJt44/6Jnc/wDg3g/wo/4Tbxx/0TO5/wDBvB/hR9Wn3X3r/MOZHe0VwX/CbeOf+iZXP/g3g/wo/wCE28cf9Eyuf/BvB/hR9Wn3X3r/ADDmR3tFcF/wm3jn/omVz/4N4P8ACj/hNvHH/RMrn/wbwf4UfVp9196/zDmR3tFcF/wm3jj/AKJnc/8Ag3g/wo/4Tbxx/wBEzuf/AAbwf4Uvq0+6+9BzI76jFcD/AMJt44/6Jlc/+DeD/Cj/AITbxz/0TK5/8G8H+FP6tPy+9BzI77FGK4H/AITbxx/0TO5/8G8H+FH/AAm3jj/omVz/AODeD/Cj6tPy+9BzI76iuB/4Tbxx/wBEyuf/AAbwf4Uf8Jt45/6Jlc/+DeD/AAo+rT8vvQ+ZHfUYrgf+E28c/wDRMrn/AMG8H+FH/CbeOf8AomVz/wCDeD/Cj6tPy+9BzI72iuC/4Tbxz/0TK5/8G8H+FH/CbeOf+iZXP/g3g/wo+rT8vvQcyO9orgv+E28cf9Eyuf8Awbwf4Uf8Jt45/wCiZXP/AIN4P8KPq0+6+9f5i5kd7RXBf8Jt45/6Jlc/+DeD/Cj/AITbxx/0TK5/8G8H+FH1afdfev8AMOZHe0VwX/CbeOP+iZXP/g3g/wAKP+E28cf9Eyuf/BvB/hR9Wn3X3oOZHfUVwP8Awm3jj/omVz/4N4P8KP8AhNfHH/RMrn/wbwf4UfVp+X3ofMd9RXA/8Jt44/6Jlc/+DeD/AAo/4Tbxx/0TK5/8G8H+FH1afl96DmR31FcD/wAJt44/6Jlc/wDg3g/wo/4Tbxx/0TK5/wDBvB/hR9Wn5feg5jvqK4H/AITbxx/0TK5/8G8H+FH/AAm3jn/omVz/AODeD/Cj6tPy+9BzI76krgv+E28c/wDRMrn/AMG8H+FH/CbeOf8AomVz/wCDeD/Cj6tPy+9C5kd7RXBf8Jt45/6Jlc/+DeD/AAo/4TXxx3+GdyPf+14P8KPq0+6+9f5j5kY/wf8A+Rx+If8A2GT/AOhyV6sK83+FOhazpeqeKtR1zTm086vfC5iiaZJCAS5IypPTcOeM16OKeLa9q0n2/II7C0UUVylBRRRQAUUUUAFFFFABRRRQAUo6UlKOlXDcTFooorYQh6UlOoxUSi2xjaQ0/FGBU+zYXI9ik8qCfXFLjFPwKMUcjAjoqTFGKORgR0uKfijFHI+4XGYoxT8UYo5H3C5HS0/FGKOR9wuR0uKfijFHI+4XGYoxT8UYo5H3C4zFJUmKMUcj7hcZSVJijFHIwuMxRin4oxRyPuFxmKKfijFHI+4XI6XFPxRijkfcLjMUlSYoxRyPuFyOlp+KMUcj7hcZijFPxRijkYXGYoxT8UYo5GBHRUmKMUcj7hcZijFPxRijkfcLjMUYp+KMUcj7hcZSVJijFHI+4XI6XFPxRijkYXI8c8fjSjin4FGBRyMLjaKdijFHs2FxtFOxRij2bC42inYoxR7NhcbRTsUYo9mwuNop2KMUezYXG0q0uKKqMbMAoooqxBRRRQAUUUUAFFFFABRRRQAUUUUAFFFFABRRRQAUUUUAFFFFABRRRQAUUUUAFFFFABRRRQAUUUUAFFFFABRRRQAUUUUAFFFFABRRRQAUUUUAFFFFABRRRQAUUUUAFFFFABRRRQAUUUUAFFFFABRRRQAUUUUAFFFFABRRRQB//9k=)

Sau khi tín hiệu được đưa về 0, ta đợi chân DATA của MCU được DHT11 kéo lên 1. Nếu chân DATA là 1 trong khoảng 26-28 us thì là 0, còn nếu tồn tại 70us là 1. Do đó trong lập trình ta bắt sườn lên của chân DATA, sau đó delay 40us. Nếu giá trị đo được là 0 thì ta đọc được bit 0, nếu giá trị đo được là 1 thì giá trị đo được là 1. Cứ như thế ta đọc các bit tiếp theo.

* + 1. Module cảm biến siêu âm HC-SR05



Figure : module cảm biến siêu âm HC-SR04

Ứng dụng:

Dùng đo khoảng cách, đo mực chất lỏng, robot dò đường,phát hiện các vết đứt gãy trong dây cáp.

A, Thông số kỹ thuật

- Điện áp vào: 5V

- Dòng tiêu thụ : <2mA

- Tín hiệu đầu ra: xung HIGH(5V) và LOW(0V)

- Khoảng cách đo : 2cm – 450cm

- Độ chính xác : 0.5cm

- Kích thước: 20\*45\*15mm

- Góc cảm biến :<15 độ

Sơ đồ chân: có 5 chân:

1. VCC : 5V.

2. Trig(T) : digital input.

3. echo (R): digital output.

4. OUT.

5. GND.

B, Nguyên lý hoạt động

+ Ở chế độ 1: Tách biệt, kích hoạt và phản hồi

      Để đo khoảng cách, ta phát 1 xung rất ngắn (5 microSeconds) từ chân TRIG. Sau đó cảm biến sẽ tạo ra 1 xung HIGH ở chân ECHO cho đến khi nhận được xung phản xạ ở chân này. Chiều rộng của xung sẽ bằng với thời gian sóng siêu âm được phát từ cảm biến quay trở lại. Tốc độ của âm thanh trong không khí là 340 m/s tương đương với 29,412 microSeconds/cm(1000000/(340\*100)). Khi đã tính được thời gian ta chia cho 29,412 để được khoảng cách cần đo.

Diagram

Description automatically generated

Figure : nguyên lý hoạt động của cảm biến HC-SR04

+Ở chế độ 2: Dùng 1 chân cho cả kích hoạt và phản hồi

     Ta sử dụng chân OUT để nó vừa phát ra xung rồi nhận xung phản xạ về,chân chế độ thì nối đất.Tín hiệu hồi tiếp sẽ suất hiện trên cùng 1 chân với tín hiệu kích hoạt.SR05 sẽ không tăng dòng phản hồi cho đến 700uS sau khi kết thúc các tín hiệu kích hoạt và bạn đã có thời gian để kích hoạt pin xoay quanh và làm cho nó trở thành 1 đầu vào.

Diagram

Description automatically generated

* + 1. Module USB to TTL CH340

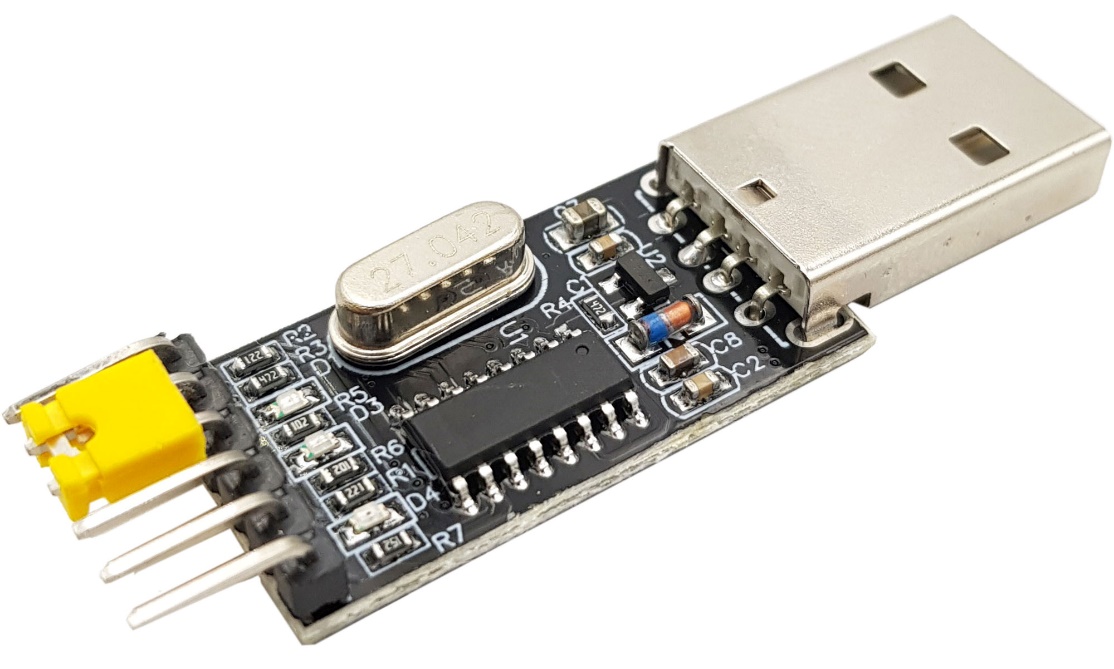


Figure : module USB to TTL CH340

Công dụng: truyền thông nối tiếp UART giữa STM32 và LAPTOP

Thông số kỹ thuật:

* Điện áp hoạt động 5V được cấp trực tiếp từ cổng USB
* Dùng chip PL2303HX để chuyển đổi dữ liệu qua UART
* Chuẩn USB sử dụng: 1.1 / 2.0 / 3.0 truyền thông
* Hỗ trợ trên máy tính với hệ thống XP, WIN 7, WIN 8.1, WIN 10, Apple
* Đầu ra ở dạng giao tiếp UART ở 2 chân RX và TX
* Trên module có 3 led báo gồm led báo nguồn, led TX và led RX
* Kích thước: 16×33 mm
* Module được gom chân: GND, TX, RX, VCC, 3.3V
* Hỗ trợ thêm điện áp 3,3V và 5V
* Giao tiếp hồng ngoại SIR IRDA cũng được hỗ trợ

## 2.2. Ngoại vi của STM32 cần sử dụng

### *2.2.1.* Truyền thông nối tiếp UART

UART tiếng anh là Universal Asynchronous Reciver/Transmister là một chuẩn giao tiếp không đồng bộ cho MCU và các thiết bị ngoại vi.

Chuẩn UART là chuẩn giao tiếp điểm và điểm, nghĩa là trong mạng chỉ có hai thiết bị đóng vai trò là transmister hoặc receiver.

A picture containing diagram

Description automatically generated

Figure : sơ đồ nối dây giao thức UART

Cách hoạt động của UART trong STM32:

UART là giao thức truyền thông không đồng bộ, nghĩa là không có xung Clock, các thiết bị có thể hiểu được nhau nếu các

UART là truyền thông song công (Full duplex) nghĩa là tại một thời điểm có thể truyền và nhận đồng thời.

Trong đó quan trọng nhất là Baund rate (tốc độ Baund) là khoảng thời gian dành cho 1 bit được truyền và phải được cài đặt giống nhau ở gửi và nhận.

Định dạng gói tin như sau:

Graphical user interface, text

Description automatically generated

Figure : định dạng gói tin của giao thức UART

* Start – Bit

Start-bit còn được gọi là bit đồng bộ hóa được đặt trước dữ liệu thực tế. Nói chung, một đường truyền dữ liệu không hoạt động được điều khiển ở mức điện áp cao. Để bắt đầu truyền dữ liệu, truyền UART kéo đường dữ liệu từ mức điện áp cao (1) xuống mức điện áp thấp (0). UART thu được thông báo sự chuyển đổi này từ mức cao sang mức thấp qua đường dữ liệu cũng như bắt đầu hiểu dữ liệu thực. Nói chung, chỉ có một start-bit.

* Stop – Bit

Bit dừng được đặt ở phần cuối của gói dữ liệu. Thông thường, bit này dài 2 bit nhưng thường chỉ sử dụng 1 bit. Để dừng sóng, UART giữ đường dữ liệu ở mức điện áp cao.

* Paratity Bit

Bit chẵn lẻ cho phép người nhận đảm bảo liệu dữ liệu được thu thập có đúng hay không. Đây là một hệ thống kiểm tra lỗi cấp thấp & bit chẵn lẻ có sẵn trong hai phạm vi như Chẵn lẻ – chẵn lẻ cũng như Chẵn lẻ – lẻ. Trên thực tế, bit này không được sử dụng rộng rãi nên không bắt buộc.

* Data Frame

Các bit dữ liệu bao gồm dữ liệu thực được truyền từ người gửi đến người nhận. Độ dài khung dữ liệu có thể nằm trong khoảng 5 & 8. Nếu bit chẵn lẻ không được sử dụng thì chiều dài khung dữ liệu có thể dài 9 bit. Nói chung, LSB của dữ liệu được truyền trước tiên sau đó nó rất hữu ích cho việc truyền.

### *2.2.2. GPIO và ngắt ngoài*

A, GPIO

GPIO (General Purpose Input/Output) chính là các chân đầu ra hoặc đầu vào dùng chung.

STM32 GPIO bao gồm 2 khối cơ bản:

* Input Driver: Bao gồm thanh ghi Input Data (IDR), và 1 trigger. Tín hiệu Input ngoài việc được ghi vào IDR còn theo các đường Analog để vào bộ ADC, hoặc theo đường Alternate function input vào các ngoại vi khác
* Output Drive: Bao gồm thanh ghi Output Data (ODR), một khối output control để chọn tín hiệu ra là từ ODR hay từ các ngoại vi khác. Tiếp đến điều khiển 2 mosfet cho điện áp ra ở I/O pin

Diagram, schematic

Description automatically generated

Figure : cấu trúc bên trong các chân GPIO của STM32

Chức năng của STM32 GPIO bao gồm:

* Input:
* Input pull-up: Đầu vào có trở kéo lên (điện áp mặc định trên chân là Vcc)
* Input pull-down: Đầu vào có trở kéo xuống (điện áp mặc định trên chân là 0V)
* Input floating: Đầu vào thả nổi, điện áp không cố định dao động từ 0V tới Vcc
* Analog: Đầu vào tương tự, dùng để đo ADC
* Output:
* Ouput Push Pull: Đầu ra dạng đẩy kéo, tín hiệu sẽ chỉ có Vcc hoặc 0V tương ứng với Bit 1 và 0 ghi vào chân đó
* Ouput Opendrain: Đầu ra dạng cực máng hở. Chỉ có thể kéo về 0V bằng cách ghi bit 0, khi ghi bit 1, chân IO sẽ có điện áp tương ứng với nguồn nối vào IO đó
* Alternate function Push Pull: Đầu ra kểu đẩy kéo sử dụng trong các ngoại vi
* Alternate function Open Drain: Đầu ra dạng cực máng hở, sử dụng trong các ngoại vi (thường gặp trong I2C)

B, Ngắt Ngoài:

EXTI (External Interupts) tạm dịch là ngắt ngoài hay ngắt sự kiện bên ngoài. Ngắt EXTI được kích hoạt khi có sự kiện từ bên ngoài tác động vào chân EXTI đó, tùy theo sự kiện đó có phù hợp với điều kiện ngắt không thì ngắt ngoài mới sảy ra.

Ngắt ngoài STM32 được mô tả như sau:

Các tham số (Main Features):

* Kích hoạt độc lập trên mỗi dòng ngắt (Line Interrupts)
* Truy cập đến từng Bit trong mỗi dòng ngắt
* Tạo ra tối đa 20 sự kiện/ngắt
* Tín hiệu phải có độ rộng xung thấp hơn chu kì xung nhịp của APB2 (vì APB2 cấp xung cho GPIO)

Các Line ngắt ngoài được tổ chức như sau:

Diagram

Description automatically generated

Figure : cấu trúc tín hiệu của các chân ngắt ngoài

Các chân PA0,PB0,…,PG0 sẽ chung là line EXTI0, Tiếp tục như vậy đến EXTI15 chúng ta có 16 ngắt.

4 ngắt ngoài đặc biệt đó là:

* EXTI line 16: dùng cho PVD output
* EXTI line 17: dùng cho sự kiện báo thức của bộ RTC
* EXTI line 18: dùng cho sự kiện thức dậy của USB
* EXTI line 19: dùng cho sự kiện thức dậy của ngoại vi Ethernet
  1. Sơ đồ kết nối STM32 và các module phần cứng.

### 2.3.1. sơ đồ nguyên lý

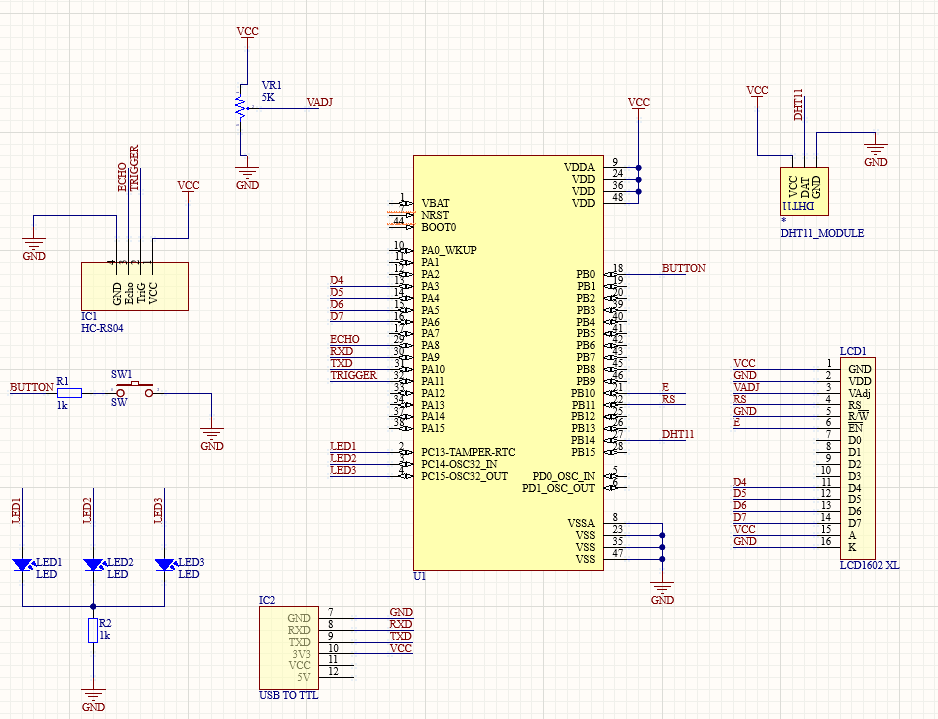


Figure : sơ đồ nguyên lý của dự án

* + 1. Sơ đồ ghép nối

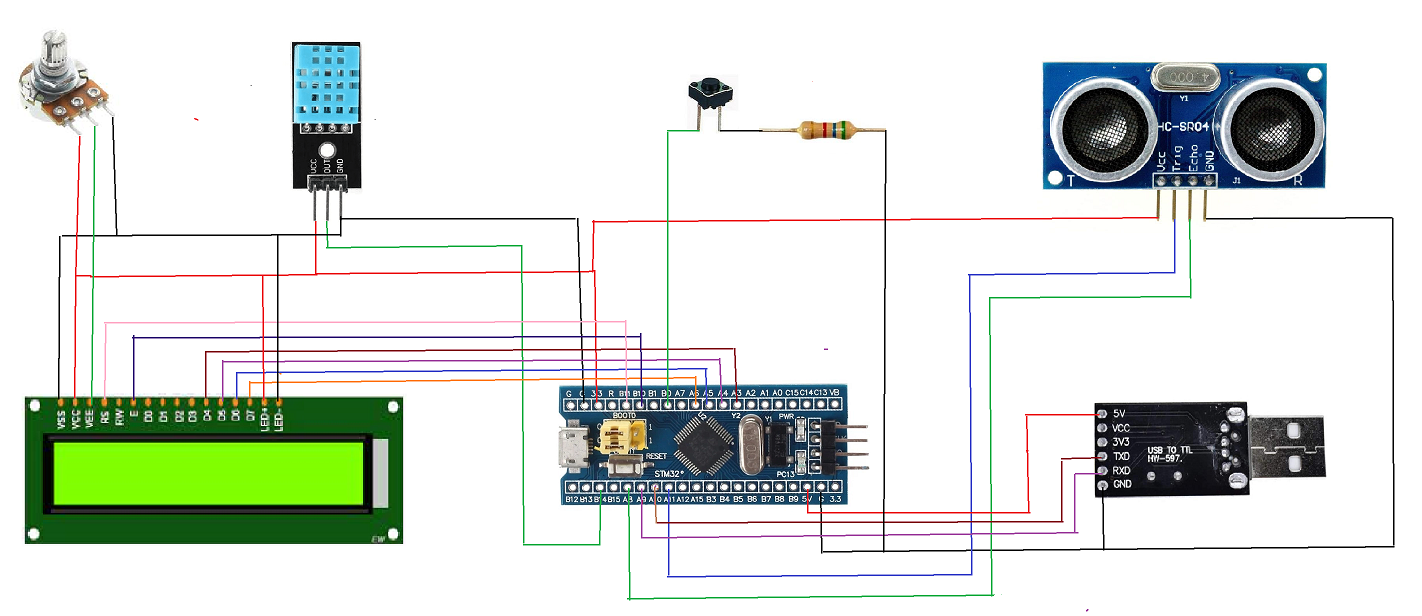


Figure : sơ đồ ghép nối các module phần cứng

* 1. Lưu đồ thuật toán giao tiếp giữa STM32 và module phần cứng

Diagram

Description automatically generated

Figure : Giao tiếp giữa STM32 với các module phần cứng

## 2.4.1. Giao tiếp giữa STM32 và DHT11

STM32 giao tiếp với DHT11 theo chuẩn 1-wire

Diagram

Description automatically generated

Figure : lưu đồ thuật toán giao tiếp giữa STM32 với DHT11

* + 1. Giao tiếp giữa STM32 với HC-RS04

Diagram

Description automatically generated

Figure : lưu đồ thuật toán giao tiếp giữa STM32 với HC-SR04

* + 1. Giao tiếp giữa STM32 với LCD

Diagram

Description automatically generated

Figure : lưu đồ thuật toán giao tiếp giữa STM32 với LCD1602

# Chương 3. Thiết kế phần mềm

## 3.1. phân tích và xử lý yêu cầu

Để thực hiện ở 2 chế độ nhóm em làm như sau:

Ngắt:

- Ngắt nhận lệnh UART (Sử dụng DMA)

- Ngắt nút nhấn (Ngắt ngoài)

Khung bản tin:

Bảng 2: khung bản tin gửi từ máy tính xuống

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Index | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Name | Start | Command | Frequency1 | Frequency2 | Threshold1 | Threshold2 | Threshold3 | Stop |
| Datatype | Uint\_8 | Uint\_8 | Uint\_8 | Uint\_8 | Uint\_8 | Uint\_8 | Uint\_8 |  |
| Value | 0x00 | 0x01, 0x02 |  |  |  |  |  | 0x07 |

Command:

0x01 : chế độ 1

0x02 : chế độ 2

## 3.2. Thiết kế chương trình đơn nhiệm

Quy ước:

Task 1: đọc nhiệt độ, độ ẩm từ DHT11

Task 2: đọc khoảng cách từ cảm biến siêu âm HC-SR04

Task 3: hiển thị kết quả lên LCD

Task 4: UART

Sau khi lập trình chạy riêng cho từng task nhóm em đo được thời gian thực hiện của các task là:

C1 = 29, T1 = 4000, D1 = 100

C2 = 72, T1 = 200, D1 = 100

C3 = 22, T1 = 100, D1 = 100

C4 = 1, T1 = 1000, D1 = 100

Từ đó tính được f = 100, p = 4000

Nhóm em lập được bảng tập lịch sau:

Timeline

Description automatically generated

Figure : lập lịch cho các task ở chế độ đa nhiệm

### 3.3. thiết kế chương trình đa nhiệm

3.3.1. Hệ điều hành Rtos

Rtos là gì?

RTOS (Real-Time operating system) hay được gọi là hệ điều hành thời gian thực mà cho phép ứng dụng của bạn chạy đa tác vụ và có thể đáp ứng được “deadline” theo thời gian thực. Lưu ý rằng việc đáp ứng được “deadline” không nhất nhiết có nghĩa là phải nhanh mà ở đây là mang tính “đúng thời điểm” và chính xác (cần là có ngay).

Ưu điểm

· Giúp chương trình của bạn dễ quản lý và phát triển vì nó giúp phân “chia” 1 vấn đề phức tạp thành các phần nhỏ hơn “để trị”.

· Tăng tính linh động và dễ bảo trì

· Dễ dàng hơn trong việc chia sẻ tài nguyên của CPU.

ứng dụng

· Chạy các dự án lớn đòi hỏi xử lý nhiều công việc nhưng vẫn phải đáp ứng được về mặt thời gian

· Các ứng dụng về viễn thông và IOT, các thiết bị liên quan đến y tế…

3.3.2. Phân tích yêu cầu liên quan tới FreeRTOS

Với các yêu cầu như trên, chúng em chọn thiết kế chương trình với các task cụ thể như sau:

Chương trình bao gồm có 6 Task:

* osThreadId ButtonTaskHandle: task DHT
* osThreadId HCSR04TaskHandle: task HCSR
* osThreadId LCDTaskHandle: task LCD
* osThreadId UARTTaskHandle: task xử lý dữ liệu nhận được từ UART
* osThreadId DHTTaskHandle: task nút nhấn
* osThreadId Uart\_ThresholdTaskHandle: task xử lý ngưỡng và uart

Để truyền dữ liệu giữa các task nhóm em sử dụng Mail Queue

Chương trình có 3 Queue:

* osMessageQId myQueueDataHandle: Gửi dữ liệu đến LCDTask
* osMessageQId myQueueUart\_ThresholdHandle: Gửi ngưỡng, chu kì đến Uart\_ThresholdTask
* osMessageQId myQueueUart\_ThresholdDataHandle: Gửi dữ liệu đến Uart\_ThresholdTask
* Nhiệm vụ các Task

- void DHTTask(void const \* argument);

+ Đọc nhiệt độ, độ ẩm gửi đến LCDTask, Uart\_ThresholdTask.

- void HCSR04Task(void const \* argument);

+ Đọc khoảng cách gửi đến LCDTask, Uart\_ThresholdTask.

- void LCDTask(void const \* argument);

+ Nhận dữ liệu từ DHTTask, HCSR04Task, hiển thị LCD.

- void UARTTask(void const \* argument);

+ Được chạy khi có dữ liệu gửi uart nhận được thông qua hàm:

BaseType\_t xHigher = xTaskResumeFromISR(UARTTaskHandle);

portEND\_SWITCHING\_ISR(xHigher);

+ Gửi dữ liệu ngưỡng, chu kì đến Uart\_ThresholdTask.

- void ButtonTask(void const \* argument);

+ Được chạy khi có dữ liệu gửi uart nhận được thông qua hàm:

BaseType\_t xHigher = xTaskResumeFromISR(ButtonTaskHandle);

+ Xử lý ngắt nút nhấn

+ Cập nhật chu kỳ để gửi đến Uart\_ThresholdTask.

- void Uart\_ThresholdTask(void const \* argument);

+ Nhận dữ liệu nhiệt độ, độ ẩm từ DHTTask.

+ Nhận dữ liệu khoảng cách từ HCSR04 Task.

+ Nhận command, ngưỡng và chu kì truyền từ UARTTask.

+ Cập nhật ngưỡng led, chu kỳ, truyền Uart, xử lý command.

Dựa và các thiết lập trên, lưu đồ thuật toán của thiết bị được xây dựng như sau:

Diagram

Description automatically generated

Figure : lưu đồ thuật toán chương trình ở chế độ đa nhiệm

# Chương 4: kết quả thực nghiệm và đánh giá

## 4.1. kết quả đạt được

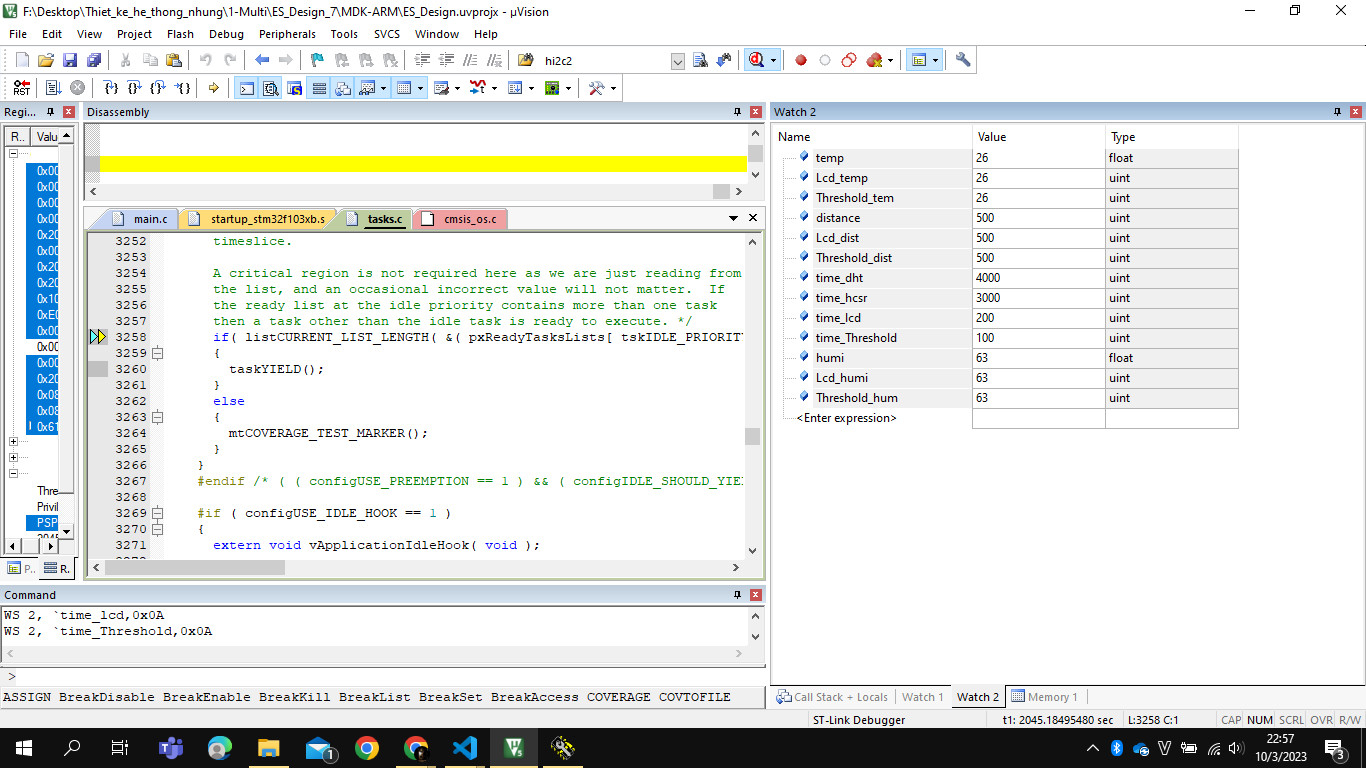


Figure : kết quả chạy ở chế độ debug

Graphical user interface, application, Word

Description automatically generated

Figure : kết quả truyền lên phần mềm hercules trên máy tính

A picture containing text

Description automatically generated

Figure : hình ảnh mạch thực tế

## 4.2. đánh giá kết quả

\* Chú thích:

- temp, distance, humi: dữ liệu đo được.

- lcd\_x: dữ liệu nhận được ở LCDTask thông qua Queue.

- Threshold\_x: - lcd\_x: dữ liệu nhận được ở Uart\_Threshold thông qua Queue.

- time\_dht: chu kì đọc DHT.

- time\_hcsr: chu kì đọc HCSR04.

- time\_lcd: chu kì task LCD.

- time\_Threshold: chu kì task Uart\_Threshold.

\* Nhận xét:

- Các thông số mô phỏng đúng với cài đặt.

+ DHTTask: 4000(ms); HCSR: 3000(ms).

+ LCDTask: 200(ms); Uart\_Threshold: 100(ms).

- Dữ liệu đọc được khá đúng với thực tế.

- Dữ liệu truyền nhận giữa cách Task qua Queue đồng bộ với nhau.

- Truyền nhận Uart đúng với chu kì cài đặt trước là 5000 ms.

## 4.3. đánh giá công việc của từng thành viên trong nhóm

|  |  |  |
| --- | --- | --- |
| Người thực hiện | Tỷ lệ | Công việc |
| Phạm Thanh Tùng | 25% | Lập trình đơn nhiệm. |
| Nguyễn Đình Dương | 25% | Lập trình đa nhiệm. |
| Lê Đình Khánh | 25% | Lập trình đa nhiệm. |
| Nguyễn Quang Minh | 25% | Lập trình đơn nhiệm |

# Chương 5: Link share thư mục lập trình

* Link Code Github: <https://github.com/teohien/Group2-Final>.