

**实 验（实训）报 告**

**项 目 名 称**  （实验名称）

**所属课程名称**  操作系统

**项 目 类 型**  验证/设计型

**实验(实训)日期**  2024.10.23

**班 级**  软件工程1班

**学 号**  220110900718

**姓 名**  林于皓

**指导教师**  陈伟锋

浙江财经大学教务处制

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| **一、实验（实训）概述：** |
| **【目的及要求】**   1. 熟悉Linux的进程的创建、通信、信号处理、销毁的基本操作。 2. 初步了解动态优先权调度的相关知识。   **【基本原理】**  1.在QEMU下运行Linux操作系统。  **【实施环境】**  **QEMU虚拟机下的debian12操作系统。** |
| **二、实验（实训）内容：** |
| **【实验（实训）过程】（步骤、记录、数据、程序等）**  **1.编译执行hello.c**    **2.编译执行fork.c，可以发现子进程成功执行，父进程成功等待紫禁城结束。**    **3.编译执行process.c，可以发现子进程和父进程建相同变量被分配到了相同的虚拟地址。**    **4.编译运行communication.c，发现子进程能够使用pipe系统调用发送消息，并使用自定义信号处理函数处理信号。**     1. 模拟优先调度 2. 程序模拟了抢占式优先调度在100个时间片上的运行结果。可能存在某些问题，因为模拟的阻塞队列中很少有进程。 3. 使用堆来存储PCB会比直接使用vector高效，但还是直接使用了vector。 4. 程序运行结果如下：     | Timer | Running | Running perority | Ready queue len | Blocked queue len |  | ----------- | ----------- | ----------- | ----------- | ----------- |  | 1 | 4 | 2 | 5 | 0 |  | 2 | 1 | 3 | 5 | 0 |  | 3 | 1 | 3 | 5 | 0 |  | 4 | 4 | 4 | 5 | 0 |  | 5 | 5 | 5 | 5 | 0 |  | 6 | 3 | 6 | 5 | 0 |  | 7 | 2 | 7 | 5 | 0 |  | 8 | 0 | 8 | 5 | 0 |  | 9 | 0 | 8 | 5 | 0 |  | 10 | 2 | 9 | 5 | 0 |  | 11 | 3 | 10 | 4 | 1 |  | 12 | 5 | 11 | 4 | 1 |  | 13 | 4 | 12 | 4 | 1 |  | 14 | 1 | 13 | 4 | 1 |  | 15 | 1 | 13 | 4 | 1 |  | 16 | 4 | 14 | 4 | 1 |  | 17 | 5 | 15 | 4 | 1 |  | 18 | 3 | 16 | 4 | 1 |  | 19 | 0 | 17 | 4 | 1 |  | 20 | 0 | 17 | 4 | 1 |  | 21 | 3 | 18 | 4 | 1 |  | 22 | 5 | 19 | 4 | 1 |  | 23 | 4 | 20 | 4 | 1 |  | 24 | 1 | 21 | 4 | 1 |  | 25 | 1 | 21 | 4 | 1 |  | 26 | 4 | 22 | 4 | 1 |  | 27 | 5 | 23 | 4 | 1 |  | 28 | 3 | 24 | 4 | 1 |  | 29 | 0 | 25 | 4 | 1 |  | 30 | 0 | 25 | 4 | 1 |  | 31 | 3 | 26 | 4 | 1 |  | 32 | 5 | 27 | 4 | 1 |  | 33 | 4 | 28 | 4 | 1 |  | 34 | 1 | 29 | 4 | 1 |  | 35 | 1 | 29 | 4 | 1 |  | 36 | 4 | 30 | 4 | 1 |  | 37 | 5 | 31 | 4 | 1 |  | 38 | 3 | 32 | 4 | 1 |  | 39 | 0 | 33 | 4 | 1 |  | 40 | 0 | 33 | 4 | 1 |  | 41 | 3 | 34 | 4 | 1 |  | 42 | 5 | 35 | 4 | 1 |  | 43 | 4 | 36 | 4 | 1 |  | 44 | 1 | 37 | 4 | 1 |  | 45 | 1 | 37 | 4 | 1 |  | 46 | 4 | 38 | 4 | 1 |  | 47 | 5 | 39 | 4 | 1 |  | 48 | 3 | 40 | 4 | 1 |  | 49 | 0 | 41 | 4 | 1 |  | 50 | 0 | 41 | 4 | 1 |  | 51 | 3 | 42 | 4 | 1 |  | 52 | 5 | 43 | 4 | 1 |  | 53 | 4 | 44 | 4 | 1 |  | 54 | 1 | 45 | 4 | 1 |  | 55 | 1 | 45 | 4 | 1 |  | 56 | 4 | 46 | 4 | 1 |  | 57 | 5 | 47 | 4 | 1 |  | 58 | 3 | 48 | 4 | 1 |  | 59 | 0 | 49 | 4 | 1 |  | 60 | 0 | 49 | 4 | 1 |  | 61 | 3 | 50 | 4 | 1 |  | 62 | 5 | 51 | 4 | 1 |  | 63 | 4 | 52 | 4 | 1 |  | 64 | 1 | 53 | 4 | 1 |  | 65 | 1 | 53 | 4 | 1 |  | 66 | 4 | 54 | 4 | 1 |  | 67 | 5 | 55 | 4 | 1 |  | 68 | 3 | 56 | 4 | 1 |  | 69 | 0 | 57 | 4 | 1 |  | 70 | 0 | 57 | 4 | 1 |  | 71 | 3 | 58 | 4 | 1 |  | 72 | 5 | 59 | 4 | 1 |  | 73 | 4 | 60 | 4 | 1 |  | 74 | 1 | 61 | 4 | 1 |  | 75 | 1 | 61 | 4 | 1 |  | 76 | 4 | 62 | 4 | 1 |  | 77 | 5 | 63 | 4 | 1 |  | 78 | 3 | 64 | 4 | 1 |  | 79 | 0 | 65 | 4 | 1 |  | 80 | 0 | 65 | 4 | 1 |  | 81 | 3 | 66 | 4 | 1 |  | 82 | 5 | 67 | 4 | 1 |  | 83 | 4 | 68 | 4 | 1 |  | 84 | 1 | 69 | 4 | 1 |  | 85 | 1 | 69 | 4 | 1 |  | 86 | 4 | 70 | 4 | 1 |  | 87 | 5 | 71 | 4 | 1 |  | 88 | 3 | 72 | 4 | 1 |  | 89 | 0 | 73 | 4 | 1 |  | 90 | 0 | 73 | 4 | 1 |  | 91 | 3 | 74 | 4 | 1 |  | 92 | 5 | 75 | 4 | 1 |  | 93 | 4 | 76 | 4 | 1 |  | 94 | 1 | 77 | 4 | 1 |  | 95 | 1 | 77 | 4 | 1 |  | 96 | 4 | 78 | 4 | 1 |  | 97 | 5 | 79 | 4 | 1 |  | 98 | 3 | 80 | 4 | 1 |  | 99 | 0 | 81 | 4 | 1 |  | 100 | 0 | 81 | 4 | 1 |  | 101 | 3 | 82 | 4 | 1 |  #### Time 1  Queue Ready -> 0 -> 2 -> 3 -> 5 -> 1  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 4 | Running | 2 | 0 | 1 | 12 | 6 | 0 |  | 0 | Ready | 1 | 0 | 1 | 6 | 3 | 0 |  | 2 | Ready | 1 | 0 | 1 | 2 | 1 | 0 |  | 3 | Ready | 1 | 0 | 1 | 8 | 1 | 0 |  | 5 | Ready | 1 | 0 | 1 | 8 | 2 | 0 |  | 1 | Ready | 2 | 0 | 1 | 5 | 4 | 0 |  ---  #### Time 2  Queue Ready -> 0 -> 2 -> 3 -> 5 -> 4  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 1 | Running | 3 | 0 | 2 | 5 | 4 | 0 |  | 0 | Ready | 2 | 0 | 2 | 6 | 3 | 0 |  | 2 | Ready | 2 | 0 | 2 | 2 | 1 | 0 |  | 3 | Ready | 2 | 0 | 2 | 8 | 1 | 0 |  | 5 | Ready | 2 | 0 | 2 | 8 | 2 | 0 |  | 4 | Ready | 2 | 1 | 2 | 12 | 6 | 0 |  ---  #### Time 3  Queue Ready -> 0 -> 2 -> 3 -> 5 -> 4  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 1 | Running | 3 | 1 | 3 | 5 | 4 | 0 |  | 0 | Ready | 3 | 0 | 3 | 6 | 3 | 0 |  | 2 | Ready | 3 | 0 | 3 | 2 | 1 | 0 |  | 3 | Ready | 3 | 0 | 3 | 8 | 1 | 0 |  | 5 | Ready | 3 | 0 | 3 | 8 | 2 | 0 |  | 4 | Ready | 3 | 1 | 3 | 12 | 6 | 0 |  ---  #### Time 4  Queue Ready -> 1 -> 0 -> 2 -> 3 -> 5  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 4 | Running | 4 | 1 | 4 | 12 | 6 | 0 |  | 1 | Ready | 3 | 2 | 4 | 5 | 4 | 0 |  | 0 | Ready | 4 | 0 | 4 | 6 | 3 | 0 |  | 2 | Ready | 4 | 0 | 4 | 2 | 1 | 0 |  | 3 | Ready | 4 | 0 | 4 | 8 | 1 | 0 |  | 5 | Ready | 4 | 0 | 4 | 8 | 2 | 0 |  ---  #### Time 5  Queue Ready -> 1 -> 4 -> 0 -> 2 -> 3  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 5 | Running | 5 | 0 | 5 | 8 | 2 | 0 |  | 1 | Ready | 4 | 2 | 5 | 5 | 4 | 0 |  | 4 | Ready | 4 | 2 | 5 | 12 | 6 | 0 |  | 0 | Ready | 5 | 0 | 5 | 6 | 3 | 0 |  | 2 | Ready | 5 | 0 | 5 | 2 | 1 | 0 |  | 3 | Ready | 5 | 0 | 5 | 8 | 1 | 0 |  ---  #### Time 6  Queue Ready -> 1 -> 4 -> 5 -> 0 -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 3 | Running | 6 | 0 | 6 | 8 | 1 | 0 |  | 1 | Ready | 5 | 2 | 6 | 5 | 4 | 0 |  | 4 | Ready | 5 | 2 | 6 | 12 | 6 | 0 |  | 5 | Ready | 5 | 1 | 6 | 8 | 2 | 0 |  | 0 | Ready | 6 | 0 | 6 | 6 | 3 | 0 |  | 2 | Ready | 6 | 0 | 6 | 2 | 1 | 0 |  ---  #### Time 7  Queue Ready -> 1 -> 4 -> 5 -> 3 -> 0  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 2 | Running | 7 | 0 | 7 | 2 | 1 | 0 |  | 1 | Ready | 6 | 2 | 7 | 5 | 4 | 0 |  | 4 | Ready | 6 | 2 | 7 | 12 | 6 | 0 |  | 5 | Ready | 6 | 1 | 7 | 8 | 2 | 0 |  | 3 | Ready | 6 | 1 | 7 | 8 | 1 | 0 |  | 0 | Ready | 7 | 0 | 7 | 6 | 3 | 0 |  ---  #### Time 8  Queue Ready -> 1 -> 4 -> 5 -> 3 -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 0 | Running | 8 | 0 | 8 | 6 | 3 | 0 |  | 1 | Ready | 7 | 2 | 8 | 5 | 4 | 0 |  | 4 | Ready | 7 | 2 | 8 | 12 | 6 | 0 |  | 5 | Ready | 7 | 1 | 8 | 8 | 2 | 0 |  | 3 | Ready | 7 | 1 | 8 | 8 | 1 | 0 |  | 2 | Ready | 7 | 1 | 8 | 2 | 1 | 0 |  ---  #### Time 9  Queue Ready -> 1 -> 4 -> 5 -> 3 -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 0 | Running | 8 | 1 | 9 | 6 | 3 | 0 |  | 1 | Ready | 8 | 2 | 9 | 5 | 4 | 0 |  | 4 | Ready | 8 | 2 | 9 | 12 | 6 | 0 |  | 5 | Ready | 8 | 1 | 9 | 8 | 2 | 0 |  | 3 | Ready | 8 | 1 | 9 | 8 | 1 | 0 |  | 2 | Ready | 8 | 1 | 9 | 2 | 1 | 0 |  ---  #### Time 10  Queue Ready -> 0 -> 1 -> 4 -> 5 -> 3  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 2 | Running | 9 | 1 | 10 | 2 | 1 | 0 |  | 0 | Ready | 8 | 2 | 10 | 6 | 3 | 0 |  | 1 | Ready | 9 | 2 | 10 | 5 | 4 | 0 |  | 4 | Ready | 9 | 2 | 10 | 12 | 6 | 0 |  | 5 | Ready | 9 | 1 | 10 | 8 | 2 | 0 |  | 3 | Ready | 9 | 1 | 10 | 8 | 1 | 0 |  ---  #### Time 11  Queue Ready -> 0 -> 1 -> 4 -> 5 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 3 | Running | 10 | 1 | 11 | 8 | 1 | 0 |  | 0 | Ready | 9 | 2 | 11 | 6 | 3 | 0 |  | 1 | Ready | 10 | 2 | 11 | 5 | 4 | 0 |  | 4 | Ready | 10 | 2 | 11 | 12 | 6 | 0 |  | 5 | Ready | 10 | 1 | 11 | 8 | 2 | 0 |  | 2 | Blocked | 9 | 2 | 11 | 2 | 1 | 10 |  ---  #### Time 12  Queue Ready -> 0 -> 3 -> 1 -> 4 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 5 | Running | 11 | 1 | 12 | 8 | 2 | 0 |  | 0 | Ready | 10 | 2 | 12 | 6 | 3 | 0 |  | 3 | Ready | 10 | 2 | 12 | 8 | 1 | 0 |  | 1 | Ready | 11 | 2 | 12 | 5 | 4 | 0 |  | 4 | Ready | 11 | 2 | 12 | 12 | 6 | 0 |  | 2 | Blocked | 9 | 2 | 12 | 2 | 1 | 10 |  ---  #### Time 13  Queue Ready -> 0 -> 3 -> 5 -> 1 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 4 | Running | 12 | 2 | 13 | 12 | 6 | 0 |  | 0 | Ready | 11 | 2 | 13 | 6 | 3 | 0 |  | 3 | Ready | 11 | 2 | 13 | 8 | 1 | 0 |  | 5 | Ready | 11 | 2 | 13 | 8 | 2 | 0 |  | 1 | Ready | 12 | 2 | 13 | 5 | 4 | 0 |  | 2 | Blocked | 9 | 2 | 13 | 2 | 1 | 10 |  ---  #### Time 14  Queue Ready -> 0 -> 3 -> 5 -> 4 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 1 | Running | 13 | 2 | 14 | 5 | 4 | 0 |  | 0 | Ready | 12 | 2 | 14 | 6 | 3 | 0 |  | 3 | Ready | 12 | 2 | 14 | 8 | 1 | 0 |  | 5 | Ready | 12 | 2 | 14 | 8 | 2 | 0 |  | 4 | Ready | 12 | 3 | 14 | 12 | 6 | 0 |  | 2 | Blocked | 9 | 2 | 14 | 2 | 1 | 10 |  ---  #### Time 15  Queue Ready -> 0 -> 3 -> 5 -> 4 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 1 | Running | 13 | 3 | 15 | 5 | 4 | 0 |  | 0 | Ready | 13 | 2 | 15 | 6 | 3 | 0 |  | 3 | Ready | 13 | 2 | 15 | 8 | 1 | 0 |  | 5 | Ready | 13 | 2 | 15 | 8 | 2 | 0 |  | 4 | Ready | 13 | 3 | 15 | 12 | 6 | 0 |  | 2 | Blocked | 9 | 2 | 15 | 2 | 1 | 10 |  ---  #### Time 16  Queue Ready -> 1 -> 0 -> 3 -> 5 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 4 | Running | 14 | 3 | 16 | 12 | 6 | 0 |  | 1 | Ready | 13 | 4 | 16 | 5 | 4 | 0 |  | 0 | Ready | 14 | 2 | 16 | 6 | 3 | 0 |  | 3 | Ready | 14 | 2 | 16 | 8 | 1 | 0 |  | 5 | Ready | 14 | 2 | 16 | 8 | 2 | 0 |  | 2 | Blocked | 9 | 2 | 16 | 2 | 1 | 10 |  ---  #### Time 17  Queue Ready -> 1 -> 4 -> 0 -> 3 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 5 | Running | 15 | 2 | 17 | 8 | 2 | 0 |  | 1 | Ready | 14 | 4 | 17 | 5 | 4 | 0 |  | 4 | Ready | 14 | 4 | 17 | 12 | 6 | 0 |  | 0 | Ready | 15 | 2 | 17 | 6 | 3 | 0 |  | 3 | Ready | 15 | 2 | 17 | 8 | 1 | 0 |  | 2 | Blocked | 9 | 2 | 17 | 2 | 1 | 10 |  ---  #### Time 18  Queue Ready -> 1 -> 4 -> 5 -> 0 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 3 | Running | 16 | 2 | 18 | 8 | 1 | 0 |  | 1 | Ready | 15 | 4 | 18 | 5 | 4 | 0 |  | 4 | Ready | 15 | 4 | 18 | 12 | 6 | 0 |  | 5 | Ready | 15 | 3 | 18 | 8 | 2 | 0 |  | 0 | Ready | 16 | 2 | 18 | 6 | 3 | 0 |  | 2 | Blocked | 9 | 2 | 18 | 2 | 1 | 10 |  ---  #### Time 19  Queue Ready -> 1 -> 4 -> 5 -> 3 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 0 | Running | 17 | 2 | 19 | 6 | 3 | 0 |  | 1 | Ready | 16 | 4 | 19 | 5 | 4 | 0 |  | 4 | Ready | 16 | 4 | 19 | 12 | 6 | 0 |  | 5 | Ready | 16 | 3 | 19 | 8 | 2 | 0 |  | 3 | Ready | 16 | 3 | 19 | 8 | 1 | 0 |  | 2 | Blocked | 9 | 2 | 19 | 2 | 1 | 10 |  ---  #### Time 20  Queue Ready -> 1 -> 4 -> 5 -> 3 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 0 | Running | 17 | 3 | 20 | 6 | 3 | 0 |  | 1 | Ready | 17 | 4 | 20 | 5 | 4 | 0 |  | 4 | Ready | 17 | 4 | 20 | 12 | 6 | 0 |  | 5 | Ready | 17 | 3 | 20 | 8 | 2 | 0 |  | 3 | Ready | 17 | 3 | 20 | 8 | 1 | 0 |  | 2 | Blocked | 9 | 2 | 20 | 2 | 1 | 10 |  ---  #### Time 21  Queue Ready -> 0 -> 1 -> 4 -> 5 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 3 | Running | 18 | 3 | 21 | 8 | 1 | 0 |  | 0 | Ready | 17 | 4 | 21 | 6 | 3 | 0 |  | 1 | Ready | 18 | 4 | 21 | 5 | 4 | 0 |  | 4 | Ready | 18 | 4 | 21 | 12 | 6 | 0 |  | 5 | Ready | 18 | 3 | 21 | 8 | 2 | 0 |  | 2 | Blocked | 9 | 2 | 21 | 2 | 1 | 10 |  ---  #### Time 22  Queue Ready -> 0 -> 3 -> 1 -> 4 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 5 | Running | 19 | 3 | 22 | 8 | 2 | 0 |  | 0 | Ready | 18 | 4 | 22 | 6 | 3 | 0 |  | 3 | Ready | 18 | 4 | 22 | 8 | 1 | 0 |  | 1 | Ready | 19 | 4 | 22 | 5 | 4 | 0 |  | 4 | Ready | 19 | 4 | 22 | 12 | 6 | 0 |  | 2 | Blocked | 9 | 2 | 22 | 2 | 1 | 10 |  ---  #### Time 23  Queue Ready -> 0 -> 3 -> 5 -> 1 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 4 | Running | 20 | 4 | 23 | 12 | 6 | 0 |  | 0 | Ready | 19 | 4 | 23 | 6 | 3 | 0 |  | 3 | Ready | 19 | 4 | 23 | 8 | 1 | 0 |  | 5 | Ready | 19 | 4 | 23 | 8 | 2 | 0 |  | 1 | Ready | 20 | 4 | 23 | 5 | 4 | 0 |  | 2 | Blocked | 9 | 2 | 23 | 2 | 1 | 10 |  ---  #### Time 24  Queue Ready -> 0 -> 3 -> 5 -> 4 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 1 | Running | 21 | 4 | 24 | 5 | 4 | 0 |  | 0 | Ready | 20 | 4 | 24 | 6 | 3 | 0 |  | 3 | Ready | 20 | 4 | 24 | 8 | 1 | 0 |  | 5 | Ready | 20 | 4 | 24 | 8 | 2 | 0 |  | 4 | Ready | 20 | 5 | 24 | 12 | 6 | 0 |  | 2 | Blocked | 9 | 2 | 24 | 2 | 1 | 10 |  ---  #### Time 25  Queue Ready -> 0 -> 3 -> 5 -> 4 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 1 | Running | 21 | 5 | 25 | 5 | 4 | 0 |  | 0 | Ready | 21 | 4 | 25 | 6 | 3 | 0 |  | 3 | Ready | 21 | 4 | 25 | 8 | 1 | 0 |  | 5 | Ready | 21 | 4 | 25 | 8 | 2 | 0 |  | 4 | Ready | 21 | 5 | 25 | 12 | 6 | 0 |  | 2 | Blocked | 9 | 2 | 25 | 2 | 1 | 10 |  ---  #### Time 26  Queue Ready -> 1 -> 0 -> 3 -> 5 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 4 | Running | 22 | 5 | 26 | 12 | 6 | 0 |  | 1 | Ready | 21 | 6 | 26 | 5 | 4 | 0 |  | 0 | Ready | 22 | 4 | 26 | 6 | 3 | 0 |  | 3 | Ready | 22 | 4 | 26 | 8 | 1 | 0 |  | 5 | Ready | 22 | 4 | 26 | 8 | 2 | 0 |  | 2 | Blocked | 9 | 2 | 26 | 2 | 1 | 10 |  ---  #### Time 27  Queue Ready -> 1 -> 4 -> 0 -> 3 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 5 | Running | 23 | 4 | 27 | 8 | 2 | 0 |  | 1 | Ready | 22 | 6 | 27 | 5 | 4 | 0 |  | 4 | Ready | 22 | 6 | 27 | 12 | 6 | 0 |  | 0 | Ready | 23 | 4 | 27 | 6 | 3 | 0 |  | 3 | Ready | 23 | 4 | 27 | 8 | 1 | 0 |  | 2 | Blocked | 9 | 2 | 27 | 2 | 1 | 10 |  ---  #### Time 28  Queue Ready -> 1 -> 4 -> 5 -> 0 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 3 | Running | 24 | 4 | 28 | 8 | 1 | 0 |  | 1 | Ready | 23 | 6 | 28 | 5 | 4 | 0 |  | 4 | Ready | 23 | 6 | 28 | 12 | 6 | 0 |  | 5 | Ready | 23 | 5 | 28 | 8 | 2 | 0 |  | 0 | Ready | 24 | 4 | 28 | 6 | 3 | 0 |  | 2 | Blocked | 9 | 2 | 28 | 2 | 1 | 10 |  ---  #### Time 29  Queue Ready -> 1 -> 4 -> 5 -> 3 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 0 | Running | 25 | 4 | 29 | 6 | 3 | 0 |  | 1 | Ready | 24 | 6 | 29 | 5 | 4 | 0 |  | 4 | Ready | 24 | 6 | 29 | 12 | 6 | 0 |  | 5 | Ready | 24 | 5 | 29 | 8 | 2 | 0 |  | 3 | Ready | 24 | 5 | 29 | 8 | 1 | 0 |  | 2 | Blocked | 9 | 2 | 29 | 2 | 1 | 10 |  ---  #### Time 30  Queue Ready -> 1 -> 4 -> 5 -> 3 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 0 | Running | 25 | 5 | 30 | 6 | 3 | 0 |  | 1 | Ready | 25 | 6 | 30 | 5 | 4 | 0 |  | 4 | Ready | 25 | 6 | 30 | 12 | 6 | 0 |  | 5 | Ready | 25 | 5 | 30 | 8 | 2 | 0 |  | 3 | Ready | 25 | 5 | 30 | 8 | 1 | 0 |  | 2 | Blocked | 9 | 2 | 30 | 2 | 1 | 10 |  ---  #### Time 31  Queue Ready -> 0 -> 1 -> 4 -> 5 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 3 | Running | 26 | 5 | 31 | 8 | 1 | 0 |  | 0 | Ready | 25 | 6 | 31 | 6 | 3 | 0 |  | 1 | Ready | 26 | 6 | 31 | 5 | 4 | 0 |  | 4 | Ready | 26 | 6 | 31 | 12 | 6 | 0 |  | 5 | Ready | 26 | 5 | 31 | 8 | 2 | 0 |  | 2 | Blocked | 9 | 2 | 31 | 2 | 1 | 10 |  ---  #### Time 32  Queue Ready -> 0 -> 3 -> 1 -> 4 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 5 | Running | 27 | 5 | 32 | 8 | 2 | 0 |  | 0 | Ready | 26 | 6 | 32 | 6 | 3 | 0 |  | 3 | Ready | 26 | 6 | 32 | 8 | 1 | 0 |  | 1 | Ready | 27 | 6 | 32 | 5 | 4 | 0 |  | 4 | Ready | 27 | 6 | 32 | 12 | 6 | 0 |  | 2 | Blocked | 9 | 2 | 32 | 2 | 1 | 10 |  ---  #### Time 33  Queue Ready -> 0 -> 3 -> 5 -> 1 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 4 | Running | 28 | 6 | 33 | 12 | 6 | 0 |  | 0 | Ready | 27 | 6 | 33 | 6 | 3 | 0 |  | 3 | Ready | 27 | 6 | 33 | 8 | 1 | 0 |  | 5 | Ready | 27 | 6 | 33 | 8 | 2 | 0 |  | 1 | Ready | 28 | 6 | 33 | 5 | 4 | 0 |  | 2 | Blocked | 9 | 2 | 33 | 2 | 1 | 10 |  ---  #### Time 34  Queue Ready -> 0 -> 3 -> 5 -> 4 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 1 | Running | 29 | 6 | 34 | 5 | 4 | 0 |  | 0 | Ready | 28 | 6 | 34 | 6 | 3 | 0 |  | 3 | Ready | 28 | 6 | 34 | 8 | 1 | 0 |  | 5 | Ready | 28 | 6 | 34 | 8 | 2 | 0 |  | 4 | Ready | 28 | 7 | 34 | 12 | 6 | 0 |  | 2 | Blocked | 9 | 2 | 34 | 2 | 1 | 10 |  ---  #### Time 35  Queue Ready -> 0 -> 3 -> 5 -> 4 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 1 | Running | 29 | 7 | 35 | 5 | 4 | 0 |  | 0 | Ready | 29 | 6 | 35 | 6 | 3 | 0 |  | 3 | Ready | 29 | 6 | 35 | 8 | 1 | 0 |  | 5 | Ready | 29 | 6 | 35 | 8 | 2 | 0 |  | 4 | Ready | 29 | 7 | 35 | 12 | 6 | 0 |  | 2 | Blocked | 9 | 2 | 35 | 2 | 1 | 10 |  ---  #### Time 36  Queue Ready -> 1 -> 0 -> 3 -> 5 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 4 | Running | 30 | 7 | 36 | 12 | 6 | 0 |  | 1 | Ready | 29 | 8 | 36 | 5 | 4 | 0 |  | 0 | Ready | 30 | 6 | 36 | 6 | 3 | 0 |  | 3 | Ready | 30 | 6 | 36 | 8 | 1 | 0 |  | 5 | Ready | 30 | 6 | 36 | 8 | 2 | 0 |  | 2 | Blocked | 9 | 2 | 36 | 2 | 1 | 10 |  ---  #### Time 37  Queue Ready -> 1 -> 4 -> 0 -> 3 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 5 | Running | 31 | 6 | 37 | 8 | 2 | 0 |  | 1 | Ready | 30 | 8 | 37 | 5 | 4 | 0 |  | 4 | Ready | 30 | 8 | 37 | 12 | 6 | 0 |  | 0 | Ready | 31 | 6 | 37 | 6 | 3 | 0 |  | 3 | Ready | 31 | 6 | 37 | 8 | 1 | 0 |  | 2 | Blocked | 9 | 2 | 37 | 2 | 1 | 10 |  ---  #### Time 38  Queue Ready -> 1 -> 4 -> 5 -> 0 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 3 | Running | 32 | 6 | 38 | 8 | 1 | 0 |  | 1 | Ready | 31 | 8 | 38 | 5 | 4 | 0 |  | 4 | Ready | 31 | 8 | 38 | 12 | 6 | 0 |  | 5 | Ready | 31 | 7 | 38 | 8 | 2 | 0 |  | 0 | Ready | 32 | 6 | 38 | 6 | 3 | 0 |  | 2 | Blocked | 9 | 2 | 38 | 2 | 1 | 10 |  ---  #### Time 39  Queue Ready -> 1 -> 4 -> 5 -> 3 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 0 | Running | 33 | 6 | 39 | 6 | 3 | 0 |  | 1 | Ready | 32 | 8 | 39 | 5 | 4 | 0 |  | 4 | Ready | 32 | 8 | 39 | 12 | 6 | 0 |  | 5 | Ready | 32 | 7 | 39 | 8 | 2 | 0 |  | 3 | Ready | 32 | 7 | 39 | 8 | 1 | 0 |  | 2 | Blocked | 9 | 2 | 39 | 2 | 1 | 10 |  ---  #### Time 40  Queue Ready -> 1 -> 4 -> 5 -> 3 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 0 | Running | 33 | 7 | 40 | 6 | 3 | 0 |  | 1 | Ready | 33 | 8 | 40 | 5 | 4 | 0 |  | 4 | Ready | 33 | 8 | 40 | 12 | 6 | 0 |  | 5 | Ready | 33 | 7 | 40 | 8 | 2 | 0 |  | 3 | Ready | 33 | 7 | 40 | 8 | 1 | 0 |  | 2 | Blocked | 9 | 2 | 40 | 2 | 1 | 10 |  ---  #### Time 41  Queue Ready -> 0 -> 1 -> 4 -> 5 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 3 | Running | 34 | 7 | 41 | 8 | 1 | 0 |  | 0 | Ready | 33 | 8 | 41 | 6 | 3 | 0 |  | 1 | Ready | 34 | 8 | 41 | 5 | 4 | 0 |  | 4 | Ready | 34 | 8 | 41 | 12 | 6 | 0 |  | 5 | Ready | 34 | 7 | 41 | 8 | 2 | 0 |  | 2 | Blocked | 9 | 2 | 41 | 2 | 1 | 10 |  ---  #### Time 42  Queue Ready -> 0 -> 3 -> 1 -> 4 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 5 | Running | 35 | 7 | 42 | 8 | 2 | 0 |  | 0 | Ready | 34 | 8 | 42 | 6 | 3 | 0 |  | 3 | Ready | 34 | 8 | 42 | 8 | 1 | 0 |  | 1 | Ready | 35 | 8 | 42 | 5 | 4 | 0 |  | 4 | Ready | 35 | 8 | 42 | 12 | 6 | 0 |  | 2 | Blocked | 9 | 2 | 42 | 2 | 1 | 10 |  ---  #### Time 43  Queue Ready -> 0 -> 3 -> 5 -> 1 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 4 | Running | 36 | 8 | 43 | 12 | 6 | 0 |  | 0 | Ready | 35 | 8 | 43 | 6 | 3 | 0 |  | 3 | Ready | 35 | 8 | 43 | 8 | 1 | 0 |  | 5 | Ready | 35 | 8 | 43 | 8 | 2 | 0 |  | 1 | Ready | 36 | 8 | 43 | 5 | 4 | 0 |  | 2 | Blocked | 9 | 2 | 43 | 2 | 1 | 10 |  ---  #### Time 44  Queue Ready -> 0 -> 3 -> 5 -> 4 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 1 | Running | 37 | 8 | 44 | 5 | 4 | 0 |  | 0 | Ready | 36 | 8 | 44 | 6 | 3 | 0 |  | 3 | Ready | 36 | 8 | 44 | 8 | 1 | 0 |  | 5 | Ready | 36 | 8 | 44 | 8 | 2 | 0 |  | 4 | Ready | 36 | 9 | 44 | 12 | 6 | 0 |  | 2 | Blocked | 9 | 2 | 44 | 2 | 1 | 10 |  ---  #### Time 45  Queue Ready -> 0 -> 3 -> 5 -> 4 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 1 | Running | 37 | 9 | 45 | 5 | 4 | 0 |  | 0 | Ready | 37 | 8 | 45 | 6 | 3 | 0 |  | 3 | Ready | 37 | 8 | 45 | 8 | 1 | 0 |  | 5 | Ready | 37 | 8 | 45 | 8 | 2 | 0 |  | 4 | Ready | 37 | 9 | 45 | 12 | 6 | 0 |  | 2 | Blocked | 9 | 2 | 45 | 2 | 1 | 10 |  ---  #### Time 46  Queue Ready -> 1 -> 0 -> 3 -> 5 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 4 | Running | 38 | 9 | 46 | 12 | 6 | 0 |  | 1 | Ready | 37 | 10 | 46 | 5 | 4 | 0 |  | 0 | Ready | 38 | 8 | 46 | 6 | 3 | 0 |  | 3 | Ready | 38 | 8 | 46 | 8 | 1 | 0 |  | 5 | Ready | 38 | 8 | 46 | 8 | 2 | 0 |  | 2 | Blocked | 9 | 2 | 46 | 2 | 1 | 10 |  ---  #### Time 47  Queue Ready -> 1 -> 4 -> 0 -> 3 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 5 | Running | 39 | 8 | 47 | 8 | 2 | 0 |  | 1 | Ready | 38 | 10 | 47 | 5 | 4 | 0 |  | 4 | Ready | 38 | 10 | 47 | 12 | 6 | 0 |  | 0 | Ready | 39 | 8 | 47 | 6 | 3 | 0 |  | 3 | Ready | 39 | 8 | 47 | 8 | 1 | 0 |  | 2 | Blocked | 9 | 2 | 47 | 2 | 1 | 10 |  ---  #### Time 48  Queue Ready -> 1 -> 4 -> 5 -> 0 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 3 | Running | 40 | 8 | 48 | 8 | 1 | 0 |  | 1 | Ready | 39 | 10 | 48 | 5 | 4 | 0 |  | 4 | Ready | 39 | 10 | 48 | 12 | 6 | 0 |  | 5 | Ready | 39 | 9 | 48 | 8 | 2 | 0 |  | 0 | Ready | 40 | 8 | 48 | 6 | 3 | 0 |  | 2 | Blocked | 9 | 2 | 48 | 2 | 1 | 10 |  ---  #### Time 49  Queue Ready -> 1 -> 4 -> 5 -> 3 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 0 | Running | 41 | 8 | 49 | 6 | 3 | 0 |  | 1 | Ready | 40 | 10 | 49 | 5 | 4 | 0 |  | 4 | Ready | 40 | 10 | 49 | 12 | 6 | 0 |  | 5 | Ready | 40 | 9 | 49 | 8 | 2 | 0 |  | 3 | Ready | 40 | 9 | 49 | 8 | 1 | 0 |  | 2 | Blocked | 9 | 2 | 49 | 2 | 1 | 10 |  ---  #### Time 50  Queue Ready -> 1 -> 4 -> 5 -> 3 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 0 | Running | 41 | 9 | 50 | 6 | 3 | 0 |  | 1 | Ready | 41 | 10 | 50 | 5 | 4 | 0 |  | 4 | Ready | 41 | 10 | 50 | 12 | 6 | 0 |  | 5 | Ready | 41 | 9 | 50 | 8 | 2 | 0 |  | 3 | Ready | 41 | 9 | 50 | 8 | 1 | 0 |  | 2 | Blocked | 9 | 2 | 50 | 2 | 1 | 10 |  ---  #### Time 51  Queue Ready -> 0 -> 1 -> 4 -> 5 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 3 | Running | 42 | 9 | 51 | 8 | 1 | 0 |  | 0 | Ready | 41 | 10 | 51 | 6 | 3 | 0 |  | 1 | Ready | 42 | 10 | 51 | 5 | 4 | 0 |  | 4 | Ready | 42 | 10 | 51 | 12 | 6 | 0 |  | 5 | Ready | 42 | 9 | 51 | 8 | 2 | 0 |  | 2 | Blocked | 9 | 2 | 51 | 2 | 1 | 10 |  ---  #### Time 52  Queue Ready -> 0 -> 3 -> 1 -> 4 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 5 | Running | 43 | 9 | 52 | 8 | 2 | 0 |  | 0 | Ready | 42 | 10 | 52 | 6 | 3 | 0 |  | 3 | Ready | 42 | 10 | 52 | 8 | 1 | 0 |  | 1 | Ready | 43 | 10 | 52 | 5 | 4 | 0 |  | 4 | Ready | 43 | 10 | 52 | 12 | 6 | 0 |  | 2 | Blocked | 9 | 2 | 52 | 2 | 1 | 10 |  ---  #### Time 53  Queue Ready -> 0 -> 3 -> 5 -> 1 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 4 | Running | 44 | 10 | 53 | 12 | 6 | 0 |  | 0 | Ready | 43 | 10 | 53 | 6 | 3 | 0 |  | 3 | Ready | 43 | 10 | 53 | 8 | 1 | 0 |  | 5 | Ready | 43 | 10 | 53 | 8 | 2 | 0 |  | 1 | Ready | 44 | 10 | 53 | 5 | 4 | 0 |  | 2 | Blocked | 9 | 2 | 53 | 2 | 1 | 10 |  ---  #### Time 54  Queue Ready -> 0 -> 3 -> 5 -> 4 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 1 | Running | 45 | 10 | 54 | 5 | 4 | 0 |  | 0 | Ready | 44 | 10 | 54 | 6 | 3 | 0 |  | 3 | Ready | 44 | 10 | 54 | 8 | 1 | 0 |  | 5 | Ready | 44 | 10 | 54 | 8 | 2 | 0 |  | 4 | Ready | 44 | 11 | 54 | 12 | 6 | 0 |  | 2 | Blocked | 9 | 2 | 54 | 2 | 1 | 10 |  ---  #### Time 55  Queue Ready -> 0 -> 3 -> 5 -> 4 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 1 | Running | 45 | 11 | 55 | 5 | 4 | 0 |  | 0 | Ready | 45 | 10 | 55 | 6 | 3 | 0 |  | 3 | Ready | 45 | 10 | 55 | 8 | 1 | 0 |  | 5 | Ready | 45 | 10 | 55 | 8 | 2 | 0 |  | 4 | Ready | 45 | 11 | 55 | 12 | 6 | 0 |  | 2 | Blocked | 9 | 2 | 55 | 2 | 1 | 10 |  ---  #### Time 56  Queue Ready -> 1 -> 0 -> 3 -> 5 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 4 | Running | 46 | 11 | 56 | 12 | 6 | 0 |  | 1 | Ready | 45 | 12 | 56 | 5 | 4 | 0 |  | 0 | Ready | 46 | 10 | 56 | 6 | 3 | 0 |  | 3 | Ready | 46 | 10 | 56 | 8 | 1 | 0 |  | 5 | Ready | 46 | 10 | 56 | 8 | 2 | 0 |  | 2 | Blocked | 9 | 2 | 56 | 2 | 1 | 10 |  ---  #### Time 57  Queue Ready -> 1 -> 4 -> 0 -> 3 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 5 | Running | 47 | 10 | 57 | 8 | 2 | 0 |  | 1 | Ready | 46 | 12 | 57 | 5 | 4 | 0 |  | 4 | Ready | 46 | 12 | 57 | 12 | 6 | 0 |  | 0 | Ready | 47 | 10 | 57 | 6 | 3 | 0 |  | 3 | Ready | 47 | 10 | 57 | 8 | 1 | 0 |  | 2 | Blocked | 9 | 2 | 57 | 2 | 1 | 10 |  ---  #### Time 58  Queue Ready -> 1 -> 4 -> 5 -> 0 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 3 | Running | 48 | 10 | 58 | 8 | 1 | 0 |  | 1 | Ready | 47 | 12 | 58 | 5 | 4 | 0 |  | 4 | Ready | 47 | 12 | 58 | 12 | 6 | 0 |  | 5 | Ready | 47 | 11 | 58 | 8 | 2 | 0 |  | 0 | Ready | 48 | 10 | 58 | 6 | 3 | 0 |  | 2 | Blocked | 9 | 2 | 58 | 2 | 1 | 10 |  ---  #### Time 59  Queue Ready -> 1 -> 4 -> 5 -> 3 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 0 | Running | 49 | 10 | 59 | 6 | 3 | 0 |  | 1 | Ready | 48 | 12 | 59 | 5 | 4 | 0 |  | 4 | Ready | 48 | 12 | 59 | 12 | 6 | 0 |  | 5 | Ready | 48 | 11 | 59 | 8 | 2 | 0 |  | 3 | Ready | 48 | 11 | 59 | 8 | 1 | 0 |  | 2 | Blocked | 9 | 2 | 59 | 2 | 1 | 10 |  ---  #### Time 60  Queue Ready -> 1 -> 4 -> 5 -> 3 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 0 | Running | 49 | 11 | 60 | 6 | 3 | 0 |  | 1 | Ready | 49 | 12 | 60 | 5 | 4 | 0 |  | 4 | Ready | 49 | 12 | 60 | 12 | 6 | 0 |  | 5 | Ready | 49 | 11 | 60 | 8 | 2 | 0 |  | 3 | Ready | 49 | 11 | 60 | 8 | 1 | 0 |  | 2 | Blocked | 9 | 2 | 60 | 2 | 1 | 10 |  ---  #### Time 61  Queue Ready -> 0 -> 1 -> 4 -> 5 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 3 | Running | 50 | 11 | 61 | 8 | 1 | 0 |  | 0 | Ready | 49 | 12 | 61 | 6 | 3 | 0 |  | 1 | Ready | 50 | 12 | 61 | 5 | 4 | 0 |  | 4 | Ready | 50 | 12 | 61 | 12 | 6 | 0 |  | 5 | Ready | 50 | 11 | 61 | 8 | 2 | 0 |  | 2 | Blocked | 9 | 2 | 61 | 2 | 1 | 10 |  ---  #### Time 62  Queue Ready -> 0 -> 3 -> 1 -> 4 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 5 | Running | 51 | 11 | 62 | 8 | 2 | 0 |  | 0 | Ready | 50 | 12 | 62 | 6 | 3 | 0 |  | 3 | Ready | 50 | 12 | 62 | 8 | 1 | 0 |  | 1 | Ready | 51 | 12 | 62 | 5 | 4 | 0 |  | 4 | Ready | 51 | 12 | 62 | 12 | 6 | 0 |  | 2 | Blocked | 9 | 2 | 62 | 2 | 1 | 10 |  ---  #### Time 63  Queue Ready -> 0 -> 3 -> 5 -> 1 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 4 | Running | 52 | 12 | 63 | 12 | 6 | 0 |  | 0 | Ready | 51 | 12 | 63 | 6 | 3 | 0 |  | 3 | Ready | 51 | 12 | 63 | 8 | 1 | 0 |  | 5 | Ready | 51 | 12 | 63 | 8 | 2 | 0 |  | 1 | Ready | 52 | 12 | 63 | 5 | 4 | 0 |  | 2 | Blocked | 9 | 2 | 63 | 2 | 1 | 10 |  ---  #### Time 64  Queue Ready -> 0 -> 3 -> 5 -> 4 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 1 | Running | 53 | 12 | 64 | 5 | 4 | 0 |  | 0 | Ready | 52 | 12 | 64 | 6 | 3 | 0 |  | 3 | Ready | 52 | 12 | 64 | 8 | 1 | 0 |  | 5 | Ready | 52 | 12 | 64 | 8 | 2 | 0 |  | 4 | Ready | 52 | 13 | 64 | 12 | 6 | 0 |  | 2 | Blocked | 9 | 2 | 64 | 2 | 1 | 10 |  ---  #### Time 65  Queue Ready -> 0 -> 3 -> 5 -> 4 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 1 | Running | 53 | 13 | 65 | 5 | 4 | 0 |  | 0 | Ready | 53 | 12 | 65 | 6 | 3 | 0 |  | 3 | Ready | 53 | 12 | 65 | 8 | 1 | 0 |  | 5 | Ready | 53 | 12 | 65 | 8 | 2 | 0 |  | 4 | Ready | 53 | 13 | 65 | 12 | 6 | 0 |  | 2 | Blocked | 9 | 2 | 65 | 2 | 1 | 10 |  ---  #### Time 66  Queue Ready -> 1 -> 0 -> 3 -> 5 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 4 | Running | 54 | 13 | 66 | 12 | 6 | 0 |  | 1 | Ready | 53 | 14 | 66 | 5 | 4 | 0 |  | 0 | Ready | 54 | 12 | 66 | 6 | 3 | 0 |  | 3 | Ready | 54 | 12 | 66 | 8 | 1 | 0 |  | 5 | Ready | 54 | 12 | 66 | 8 | 2 | 0 |  | 2 | Blocked | 9 | 2 | 66 | 2 | 1 | 10 |  ---  #### Time 67  Queue Ready -> 1 -> 4 -> 0 -> 3 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 5 | Running | 55 | 12 | 67 | 8 | 2 | 0 |  | 1 | Ready | 54 | 14 | 67 | 5 | 4 | 0 |  | 4 | Ready | 54 | 14 | 67 | 12 | 6 | 0 |  | 0 | Ready | 55 | 12 | 67 | 6 | 3 | 0 |  | 3 | Ready | 55 | 12 | 67 | 8 | 1 | 0 |  | 2 | Blocked | 9 | 2 | 67 | 2 | 1 | 10 |  ---  #### Time 68  Queue Ready -> 1 -> 4 -> 5 -> 0 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 3 | Running | 56 | 12 | 68 | 8 | 1 | 0 |  | 1 | Ready | 55 | 14 | 68 | 5 | 4 | 0 |  | 4 | Ready | 55 | 14 | 68 | 12 | 6 | 0 |  | 5 | Ready | 55 | 13 | 68 | 8 | 2 | 0 |  | 0 | Ready | 56 | 12 | 68 | 6 | 3 | 0 |  | 2 | Blocked | 9 | 2 | 68 | 2 | 1 | 10 |  ---  #### Time 69  Queue Ready -> 1 -> 4 -> 5 -> 3 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 0 | Running | 57 | 12 | 69 | 6 | 3 | 0 |  | 1 | Ready | 56 | 14 | 69 | 5 | 4 | 0 |  | 4 | Ready | 56 | 14 | 69 | 12 | 6 | 0 |  | 5 | Ready | 56 | 13 | 69 | 8 | 2 | 0 |  | 3 | Ready | 56 | 13 | 69 | 8 | 1 | 0 |  | 2 | Blocked | 9 | 2 | 69 | 2 | 1 | 10 |  ---  #### Time 70  Queue Ready -> 1 -> 4 -> 5 -> 3 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 0 | Running | 57 | 13 | 70 | 6 | 3 | 0 |  | 1 | Ready | 57 | 14 | 70 | 5 | 4 | 0 |  | 4 | Ready | 57 | 14 | 70 | 12 | 6 | 0 |  | 5 | Ready | 57 | 13 | 70 | 8 | 2 | 0 |  | 3 | Ready | 57 | 13 | 70 | 8 | 1 | 0 |  | 2 | Blocked | 9 | 2 | 70 | 2 | 1 | 10 |  ---  #### Time 71  Queue Ready -> 0 -> 1 -> 4 -> 5 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 3 | Running | 58 | 13 | 71 | 8 | 1 | 0 |  | 0 | Ready | 57 | 14 | 71 | 6 | 3 | 0 |  | 1 | Ready | 58 | 14 | 71 | 5 | 4 | 0 |  | 4 | Ready | 58 | 14 | 71 | 12 | 6 | 0 |  | 5 | Ready | 58 | 13 | 71 | 8 | 2 | 0 |  | 2 | Blocked | 9 | 2 | 71 | 2 | 1 | 10 |  ---  #### Time 72  Queue Ready -> 0 -> 3 -> 1 -> 4 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 5 | Running | 59 | 13 | 72 | 8 | 2 | 0 |  | 0 | Ready | 58 | 14 | 72 | 6 | 3 | 0 |  | 3 | Ready | 58 | 14 | 72 | 8 | 1 | 0 |  | 1 | Ready | 59 | 14 | 72 | 5 | 4 | 0 |  | 4 | Ready | 59 | 14 | 72 | 12 | 6 | 0 |  | 2 | Blocked | 9 | 2 | 72 | 2 | 1 | 10 |  ---  #### Time 73  Queue Ready -> 0 -> 3 -> 5 -> 1 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 4 | Running | 60 | 14 | 73 | 12 | 6 | 0 |  | 0 | Ready | 59 | 14 | 73 | 6 | 3 | 0 |  | 3 | Ready | 59 | 14 | 73 | 8 | 1 | 0 |  | 5 | Ready | 59 | 14 | 73 | 8 | 2 | 0 |  | 1 | Ready | 60 | 14 | 73 | 5 | 4 | 0 |  | 2 | Blocked | 9 | 2 | 73 | 2 | 1 | 10 |  ---  #### Time 74  Queue Ready -> 0 -> 3 -> 5 -> 4 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 1 | Running | 61 | 14 | 74 | 5 | 4 | 0 |  | 0 | Ready | 60 | 14 | 74 | 6 | 3 | 0 |  | 3 | Ready | 60 | 14 | 74 | 8 | 1 | 0 |  | 5 | Ready | 60 | 14 | 74 | 8 | 2 | 0 |  | 4 | Ready | 60 | 15 | 74 | 12 | 6 | 0 |  | 2 | Blocked | 9 | 2 | 74 | 2 | 1 | 10 |  ---  #### Time 75  Queue Ready -> 0 -> 3 -> 5 -> 4 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 1 | Running | 61 | 15 | 75 | 5 | 4 | 0 |  | 0 | Ready | 61 | 14 | 75 | 6 | 3 | 0 |  | 3 | Ready | 61 | 14 | 75 | 8 | 1 | 0 |  | 5 | Ready | 61 | 14 | 75 | 8 | 2 | 0 |  | 4 | Ready | 61 | 15 | 75 | 12 | 6 | 0 |  | 2 | Blocked | 9 | 2 | 75 | 2 | 1 | 10 |  ---  #### Time 76  Queue Ready -> 1 -> 0 -> 3 -> 5 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 4 | Running | 62 | 15 | 76 | 12 | 6 | 0 |  | 1 | Ready | 61 | 16 | 76 | 5 | 4 | 0 |  | 0 | Ready | 62 | 14 | 76 | 6 | 3 | 0 |  | 3 | Ready | 62 | 14 | 76 | 8 | 1 | 0 |  | 5 | Ready | 62 | 14 | 76 | 8 | 2 | 0 |  | 2 | Blocked | 9 | 2 | 76 | 2 | 1 | 10 |  ---  #### Time 77  Queue Ready -> 1 -> 4 -> 0 -> 3 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 5 | Running | 63 | 14 | 77 | 8 | 2 | 0 |  | 1 | Ready | 62 | 16 | 77 | 5 | 4 | 0 |  | 4 | Ready | 62 | 16 | 77 | 12 | 6 | 0 |  | 0 | Ready | 63 | 14 | 77 | 6 | 3 | 0 |  | 3 | Ready | 63 | 14 | 77 | 8 | 1 | 0 |  | 2 | Blocked | 9 | 2 | 77 | 2 | 1 | 10 |  ---  #### Time 78  Queue Ready -> 1 -> 4 -> 5 -> 0 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 3 | Running | 64 | 14 | 78 | 8 | 1 | 0 |  | 1 | Ready | 63 | 16 | 78 | 5 | 4 | 0 |  | 4 | Ready | 63 | 16 | 78 | 12 | 6 | 0 |  | 5 | Ready | 63 | 15 | 78 | 8 | 2 | 0 |  | 0 | Ready | 64 | 14 | 78 | 6 | 3 | 0 |  | 2 | Blocked | 9 | 2 | 78 | 2 | 1 | 10 |  ---  #### Time 79  Queue Ready -> 1 -> 4 -> 5 -> 3 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 0 | Running | 65 | 14 | 79 | 6 | 3 | 0 |  | 1 | Ready | 64 | 16 | 79 | 5 | 4 | 0 |  | 4 | Ready | 64 | 16 | 79 | 12 | 6 | 0 |  | 5 | Ready | 64 | 15 | 79 | 8 | 2 | 0 |  | 3 | Ready | 64 | 15 | 79 | 8 | 1 | 0 |  | 2 | Blocked | 9 | 2 | 79 | 2 | 1 | 10 |  ---  #### Time 80  Queue Ready -> 1 -> 4 -> 5 -> 3 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 0 | Running | 65 | 15 | 80 | 6 | 3 | 0 |  | 1 | Ready | 65 | 16 | 80 | 5 | 4 | 0 |  | 4 | Ready | 65 | 16 | 80 | 12 | 6 | 0 |  | 5 | Ready | 65 | 15 | 80 | 8 | 2 | 0 |  | 3 | Ready | 65 | 15 | 80 | 8 | 1 | 0 |  | 2 | Blocked | 9 | 2 | 80 | 2 | 1 | 10 |  ---  #### Time 81  Queue Ready -> 0 -> 1 -> 4 -> 5 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 3 | Running | 66 | 15 | 81 | 8 | 1 | 0 |  | 0 | Ready | 65 | 16 | 81 | 6 | 3 | 0 |  | 1 | Ready | 66 | 16 | 81 | 5 | 4 | 0 |  | 4 | Ready | 66 | 16 | 81 | 12 | 6 | 0 |  | 5 | Ready | 66 | 15 | 81 | 8 | 2 | 0 |  | 2 | Blocked | 9 | 2 | 81 | 2 | 1 | 10 |  ---  #### Time 82  Queue Ready -> 0 -> 3 -> 1 -> 4 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 5 | Running | 67 | 15 | 82 | 8 | 2 | 0 |  | 0 | Ready | 66 | 16 | 82 | 6 | 3 | 0 |  | 3 | Ready | 66 | 16 | 82 | 8 | 1 | 0 |  | 1 | Ready | 67 | 16 | 82 | 5 | 4 | 0 |  | 4 | Ready | 67 | 16 | 82 | 12 | 6 | 0 |  | 2 | Blocked | 9 | 2 | 82 | 2 | 1 | 10 |  ---  #### Time 83  Queue Ready -> 0 -> 3 -> 5 -> 1 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 4 | Running | 68 | 16 | 83 | 12 | 6 | 0 |  | 0 | Ready | 67 | 16 | 83 | 6 | 3 | 0 |  | 3 | Ready | 67 | 16 | 83 | 8 | 1 | 0 |  | 5 | Ready | 67 | 16 | 83 | 8 | 2 | 0 |  | 1 | Ready | 68 | 16 | 83 | 5 | 4 | 0 |  | 2 | Blocked | 9 | 2 | 83 | 2 | 1 | 10 |  ---  #### Time 84  Queue Ready -> 0 -> 3 -> 5 -> 4 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 1 | Running | 69 | 16 | 84 | 5 | 4 | 0 |  | 0 | Ready | 68 | 16 | 84 | 6 | 3 | 0 |  | 3 | Ready | 68 | 16 | 84 | 8 | 1 | 0 |  | 5 | Ready | 68 | 16 | 84 | 8 | 2 | 0 |  | 4 | Ready | 68 | 17 | 84 | 12 | 6 | 0 |  | 2 | Blocked | 9 | 2 | 84 | 2 | 1 | 10 |  ---  #### Time 85  Queue Ready -> 0 -> 3 -> 5 -> 4 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 1 | Running | 69 | 17 | 85 | 5 | 4 | 0 |  | 0 | Ready | 69 | 16 | 85 | 6 | 3 | 0 |  | 3 | Ready | 69 | 16 | 85 | 8 | 1 | 0 |  | 5 | Ready | 69 | 16 | 85 | 8 | 2 | 0 |  | 4 | Ready | 69 | 17 | 85 | 12 | 6 | 0 |  | 2 | Blocked | 9 | 2 | 85 | 2 | 1 | 10 |  ---  #### Time 86  Queue Ready -> 1 -> 0 -> 3 -> 5 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 4 | Running | 70 | 17 | 86 | 12 | 6 | 0 |  | 1 | Ready | 69 | 18 | 86 | 5 | 4 | 0 |  | 0 | Ready | 70 | 16 | 86 | 6 | 3 | 0 |  | 3 | Ready | 70 | 16 | 86 | 8 | 1 | 0 |  | 5 | Ready | 70 | 16 | 86 | 8 | 2 | 0 |  | 2 | Blocked | 9 | 2 | 86 | 2 | 1 | 10 |  ---  #### Time 87  Queue Ready -> 1 -> 4 -> 0 -> 3 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 5 | Running | 71 | 16 | 87 | 8 | 2 | 0 |  | 1 | Ready | 70 | 18 | 87 | 5 | 4 | 0 |  | 4 | Ready | 70 | 18 | 87 | 12 | 6 | 0 |  | 0 | Ready | 71 | 16 | 87 | 6 | 3 | 0 |  | 3 | Ready | 71 | 16 | 87 | 8 | 1 | 0 |  | 2 | Blocked | 9 | 2 | 87 | 2 | 1 | 10 |  ---  #### Time 88  Queue Ready -> 1 -> 4 -> 5 -> 0 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 3 | Running | 72 | 16 | 88 | 8 | 1 | 0 |  | 1 | Ready | 71 | 18 | 88 | 5 | 4 | 0 |  | 4 | Ready | 71 | 18 | 88 | 12 | 6 | 0 |  | 5 | Ready | 71 | 17 | 88 | 8 | 2 | 0 |  | 0 | Ready | 72 | 16 | 88 | 6 | 3 | 0 |  | 2 | Blocked | 9 | 2 | 88 | 2 | 1 | 10 |  ---  #### Time 89  Queue Ready -> 1 -> 4 -> 5 -> 3 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 0 | Running | 73 | 16 | 89 | 6 | 3 | 0 |  | 1 | Ready | 72 | 18 | 89 | 5 | 4 | 0 |  | 4 | Ready | 72 | 18 | 89 | 12 | 6 | 0 |  | 5 | Ready | 72 | 17 | 89 | 8 | 2 | 0 |  | 3 | Ready | 72 | 17 | 89 | 8 | 1 | 0 |  | 2 | Blocked | 9 | 2 | 89 | 2 | 1 | 10 |  ---  #### Time 90  Queue Ready -> 1 -> 4 -> 5 -> 3 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 0 | Running | 73 | 17 | 90 | 6 | 3 | 0 |  | 1 | Ready | 73 | 18 | 90 | 5 | 4 | 0 |  | 4 | Ready | 73 | 18 | 90 | 12 | 6 | 0 |  | 5 | Ready | 73 | 17 | 90 | 8 | 2 | 0 |  | 3 | Ready | 73 | 17 | 90 | 8 | 1 | 0 |  | 2 | Blocked | 9 | 2 | 90 | 2 | 1 | 10 |  ---  #### Time 91  Queue Ready -> 0 -> 1 -> 4 -> 5 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 3 | Running | 74 | 17 | 91 | 8 | 1 | 0 |  | 0 | Ready | 73 | 18 | 91 | 6 | 3 | 0 |  | 1 | Ready | 74 | 18 | 91 | 5 | 4 | 0 |  | 4 | Ready | 74 | 18 | 91 | 12 | 6 | 0 |  | 5 | Ready | 74 | 17 | 91 | 8 | 2 | 0 |  | 2 | Blocked | 9 | 2 | 91 | 2 | 1 | 10 |  ---  #### Time 92  Queue Ready -> 0 -> 3 -> 1 -> 4 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 5 | Running | 75 | 17 | 92 | 8 | 2 | 0 |  | 0 | Ready | 74 | 18 | 92 | 6 | 3 | 0 |  | 3 | Ready | 74 | 18 | 92 | 8 | 1 | 0 |  | 1 | Ready | 75 | 18 | 92 | 5 | 4 | 0 |  | 4 | Ready | 75 | 18 | 92 | 12 | 6 | 0 |  | 2 | Blocked | 9 | 2 | 92 | 2 | 1 | 10 |  ---  #### Time 93  Queue Ready -> 0 -> 3 -> 5 -> 1 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 4 | Running | 76 | 18 | 93 | 12 | 6 | 0 |  | 0 | Ready | 75 | 18 | 93 | 6 | 3 | 0 |  | 3 | Ready | 75 | 18 | 93 | 8 | 1 | 0 |  | 5 | Ready | 75 | 18 | 93 | 8 | 2 | 0 |  | 1 | Ready | 76 | 18 | 93 | 5 | 4 | 0 |  | 2 | Blocked | 9 | 2 | 93 | 2 | 1 | 10 |  ---  #### Time 94  Queue Ready -> 0 -> 3 -> 5 -> 4 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 1 | Running | 77 | 18 | 94 | 5 | 4 | 0 |  | 0 | Ready | 76 | 18 | 94 | 6 | 3 | 0 |  | 3 | Ready | 76 | 18 | 94 | 8 | 1 | 0 |  | 5 | Ready | 76 | 18 | 94 | 8 | 2 | 0 |  | 4 | Ready | 76 | 19 | 94 | 12 | 6 | 0 |  | 2 | Blocked | 9 | 2 | 94 | 2 | 1 | 10 |  ---  #### Time 95  Queue Ready -> 0 -> 3 -> 5 -> 4 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 1 | Running | 77 | 19 | 95 | 5 | 4 | 0 |  | 0 | Ready | 77 | 18 | 95 | 6 | 3 | 0 |  | 3 | Ready | 77 | 18 | 95 | 8 | 1 | 0 |  | 5 | Ready | 77 | 18 | 95 | 8 | 2 | 0 |  | 4 | Ready | 77 | 19 | 95 | 12 | 6 | 0 |  | 2 | Blocked | 9 | 2 | 95 | 2 | 1 | 10 |  ---  #### Time 96  Queue Ready -> 1 -> 0 -> 3 -> 5 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 4 | Running | 78 | 19 | 96 | 12 | 6 | 0 |  | 1 | Ready | 77 | 20 | 96 | 5 | 4 | 0 |  | 0 | Ready | 78 | 18 | 96 | 6 | 3 | 0 |  | 3 | Ready | 78 | 18 | 96 | 8 | 1 | 0 |  | 5 | Ready | 78 | 18 | 96 | 8 | 2 | 0 |  | 2 | Blocked | 9 | 2 | 96 | 2 | 1 | 10 |  ---  #### Time 97  Queue Ready -> 1 -> 4 -> 0 -> 3 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 5 | Running | 79 | 18 | 97 | 8 | 2 | 0 |  | 1 | Ready | 78 | 20 | 97 | 5 | 4 | 0 |  | 4 | Ready | 78 | 20 | 97 | 12 | 6 | 0 |  | 0 | Ready | 79 | 18 | 97 | 6 | 3 | 0 |  | 3 | Ready | 79 | 18 | 97 | 8 | 1 | 0 |  | 2 | Blocked | 9 | 2 | 97 | 2 | 1 | 10 |  ---  #### Time 98  Queue Ready -> 1 -> 4 -> 5 -> 0 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 3 | Running | 80 | 18 | 98 | 8 | 1 | 0 |  | 1 | Ready | 79 | 20 | 98 | 5 | 4 | 0 |  | 4 | Ready | 79 | 20 | 98 | 12 | 6 | 0 |  | 5 | Ready | 79 | 19 | 98 | 8 | 2 | 0 |  | 0 | Ready | 80 | 18 | 98 | 6 | 3 | 0 |  | 2 | Blocked | 9 | 2 | 98 | 2 | 1 | 10 |  ---  #### Time 99  Queue Ready -> 1 -> 4 -> 5 -> 3 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 0 | Running | 81 | 18 | 99 | 6 | 3 | 0 |  | 1 | Ready | 80 | 20 | 99 | 5 | 4 | 0 |  | 4 | Ready | 80 | 20 | 99 | 12 | 6 | 0 |  | 5 | Ready | 80 | 19 | 99 | 8 | 2 | 0 |  | 3 | Ready | 80 | 19 | 99 | 8 | 1 | 0 |  | 2 | Blocked | 9 | 2 | 99 | 2 | 1 | 10 |  ---  #### Time 100  Queue Ready -> 1 -> 4 -> 5 -> 3 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 0 | Running | 81 | 19 | 100 | 6 | 3 | 0 |  | 1 | Ready | 81 | 20 | 100 | 5 | 4 | 0 |  | 4 | Ready | 81 | 20 | 100 | 12 | 6 | 0 |  | 5 | Ready | 81 | 19 | 100 | 8 | 2 | 0 |  | 3 | Ready | 81 | 19 | 100 | 8 | 1 | 0 |  | 2 | Blocked | 9 | 2 | 100 | 2 | 1 | 10 |  ---  #### Time 101  Queue Ready -> 0 -> 1 -> 4 -> 5 Queue Blocking -> 2  | Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |  | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |  | 3 | Running | 82 | 19 | 101 | 8 | 1 | 0 |  | 0 | Ready | 81 | 20 | 101 | 6 | 3 | 0 |  | 1 | Ready | 82 | 20 | 101 | 5 | 4 | 0 |  | 4 | Ready | 82 | 20 | 101 | 12 | 6 | 0 |  | 5 | Ready | 82 | 19 | 101 | 8 | 2 | 0 |  | 2 | Blocked | 9 | 2 | 101 | 2 | 1 | 10 |  ---   1. 程序代码如下：   use std::{  cmp::Ordering,  collections::{BTreeSet, BinaryHeap},  fs::File,  io::Write,  path::PathBuf,  };  use serde::{Deserialize, Serialize};  use split\_iter::Splittable;  pub mod print\_table;  const PRO\_AFF\_RUNNING: i64 = -3;  const PRO\_AFF\_READY: i64 = 1;  #[derive(Debug, Clone, PartialEq, Eq)]  pub enum PCBState {  Ready,  Blocked,  Running,  }  #[derive(Debug, Clone, PartialEq, Eq, Serialize, Deserialize)]  pub struct PCB {  id: usize,  priority: u64,  cpu\_time: u64,  // all\_time : u64,  block\_when: u64,  run\_when: u64,  rund: u64,  block\_time: u64,  start\_block: u64,  }  impl PCB {  pub fn new(id: usize, priority: u64, block\_time: u64, start\_block: u64) -> Self {  Self {  id,  priority,  cpu\_time: 0,  // all\_time: 0,  block\_when: 0,  run\_when: 0,  rund: 0,  block\_time,  start\_block,  }  }  }  impl Ord for PCB {  fn cmp(&self, other: &Self) -> Ordering {  self.priority.cmp(&other.priority)  }  }  impl PartialOrd for PCB {  fn partial\_cmp(&self, other: &Self) -> Option<Ordering> {  Some(self.priority.cmp(&other.priority))  }  }  pub struct Scheduler {  running: Option<PCB>,  waiting: Vec<PCB>,  blocked: Vec<PCB>,  timer: u64,  }  impl Scheduler {  pub fn new(tasks: Vec<PCB>) -> Self {  Self {  running: None,  waiting: tasks,  blocked: Vec::new(),  timer: 0u64,  }  }  pub fn clear(&mut self) {  self.blocked.clear();  self.waiting.clear();  self.running = None;  }  pub fn run\_tick(&mut self) {  self.waiting.iter\_mut().for\_each(|i| {  i.priority = i  .priority  .checked\_add\_signed(PRO\_AFF\_READY)  .unwrap\_or\_default()  });  let (prv, blocked) = self  .blocked  .iter()  .split(|i| self.timer - i.block\_when + i.rund >= i.block\_time);  self.waiting.extend(prv.map(|i| {  let mut pcb = i.to\_owned();  pcb.rund = 0;  pcb  }));  self.waiting.sort();  self.blocked = blocked.map(|i| i.to\_owned()).collect::<Vec<\_>>();  self.blocked.sort();  self.running = if let Some(running) = self.running.as\_mut() {  running  .priority  .checked\_add\_signed(PRO\_AFF\_RUNNING)  .unwrap\_or\_default();  running.cpu\_time += 1;  if self.timer - running.run\_when + running.rund >= running.start\_block {  running.block\_when = self.timer;  self.blocked.push(running.clone());  self.blocked.sort();  None  } else {  Some(running.clone())  }  } else {  None  };  let peak = self.waiting.last().map(|i| i.to\_owned());  self.running = if let Some(mut peak) = peak {  if let Some(running) = self.running.as\_mut() {  if running.priority < peak.priority {  let \_ = self.waiting.pop();  peak.run\_when = self.timer;  running.rund = self.timer - running.run\_when;  self.waiting.push(running.clone());  self.waiting.sort();  Some(peak)  } else {  Some(running.clone())  }  } else {  let \_ = self.waiting.pop();  self.waiting.sort();  peak.run\_when = self.timer;  Some(peak)  }  } else {  None  };  self.timer += 1;  }  // pub fn run\_step(&mut self) {  // if let Some(running) = self.running.as\_mut() {  // let time\_passed = running.block\_when;  // self.timer += time\_passed;  // running.cpu\_time += time\_passed;  // running.priority = running  // .priority  // .checked\_add\_signed(PRO\_AFF\_RUNNING)  // .unwrap\_or\_default();  // running.block\_when = self.timer;  // self.waiting.iter\_mut().for\_each(|i| {  // i.priority = i  // .priority  // .checked\_add\_signed(PRO\_AFF\_READY)  // .unwrap\_or\_default()  // });  // self.blocked.push(running.clone());  // self.blocked.sort();  // }  // self.running = self.waiting.pop();  // let cus = self  // .blocked  // .iter()  // .filter(|i| self.timer - i.block\_when > i.block\_time)  // .map(|i| i.clone());  // self.waiting.extend(cus);  // self.blocked = self  // .blocked  // .clone()  // .into\_iter()  // .filter(|i| !(self.timer - i.block\_when > i.block\_time))  // .collect();  // self.waiting.sort();  // self.blocked.sort();  // }  pub fn put(&self, f: &mut impl Write) -> Result<(), std::io::Error> {  write!(  f,  "at {} , running = {}({}) , len(ready) = {} , len(blocked) = {}",  self.timer,  self.running.as\_ref().map(|i| i.id as i64).unwrap\_or(-1),  self.running  .as\_ref()  .map(|i| i.priority as i64)  .unwrap\_or(-1),  self.waiting.len(),  self.blocked.len()  )?;  Ok(())  }  pub fn put\_time\_series(  &self,  include\_header: bool,  f: &mut impl Write,  ) -> Result<(), std::io::Error> {  if include\_header {  writeln!(  f,  "\n| Timer | Running | Running perority | Ready queue len | Blocked queue len |"  )?;  writeln!(  f,  "| ----------- | ----------- | ----------- | ----------- | ----------- |"  )?;  return Ok(());  }  if let Some(running) = &self.running {  // let \_ = (self.timer..self.timer + running.block\_time - 1)  // .into\_iter()  // .all(|i| {  // writeln!(  // f,  // "| {} | {} | {} | {} | {} |",  // i,  // self.running.as\_ref().map(|i| i.id as i64).unwrap\_or(-1),  // self.running  // .as\_ref()  // .map(|i| i.priority as i64)  // .unwrap\_or(-1),  // self.waiting.len(),  // self.blocked.len()  // )  // .is\_ok()  // });  writeln!(  f,  "| {} | {} | {} | {} | {} |",  self.timer,  self.running.as\_ref().map(|i| i.id as i64).unwrap\_or(-1),  self.running  .as\_ref()  .map(|i| i.priority as i64)  .unwrap\_or(-1),  self.waiting.len(),  self.blocked.len()  )?;  }  Ok(())  }  pub fn put\_task\_series(&self, f: &mut impl Write) -> Result<(), std::io::Error> {  fn write\_queue(  name: &str,  queue: &[PCB],  f: &mut impl Write,  ) -> Result<(), std::io::Error> {  if !queue.is\_empty() {  write!(f, "Queue {} ", name)?;  for pcb in queue {  write!(f, "-> {} ", pcb.id)?;  }  }  Ok(())  }  fn write\_pcb(  pcb: &PCB,  status: &str,  all\_time: u64,  f: &mut impl Write,  ) -> Result<(), std::io::Error> {  writeln!(  f,  "| {} | {} | {} | {} | {} | {} | {} | {} |",  pcb.id,  status,  pcb.priority,  pcb.cpu\_time,  all\_time,  pcb.start\_block,  pcb.block\_time,  pcb.block\_when  )?;  Ok(())  }  writeln!(f, "#### Time {}", self.timer)?;  write\_queue("Ready", &self.waiting, f)?;  write\_queue("Blocking", &self.blocked, f)?;  writeln!(  f,  "\n| Id | Staus | Priority | Cpu Time | All Time | Start Block | Block Time | Blocked When |"  )?;  writeln!(f,"| ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- | ----------- |")?;  if let Some(running) = self.running.as\_ref() {  write\_pcb(running, "Running", self.timer, f)?;  }  for pcb in self.waiting.iter() {  write\_pcb(pcb, "Ready ", self.timer, f)?;  }  for pcb in self.blocked.iter() {  write\_pcb(pcb, "Blocked", self.timer, f)?;  }  writeln!(f, "\n---\n")?;  Ok(())  }  pub fn all\_tasks(&self) -> Vec<PCB> {  let mut tasks = self.waiting.clone();  tasks.extend(self.blocked.clone());  if let Some(running) = &self.running {  tasks.push(running.clone());  }  return tasks;  }  }  fn main() -> Result<(), std::io::Error> {  let sample = vec![PCB::new(0, 0, 3, 6), PCB::new(1, 0, 2, 8)];  let mut scheduler = Scheduler::new(sample);  loop {  print!("\n>>>");  std::io::stdout().flush()?;  let mut buf = String::new();  std::io::stdin().read\_line(&mut buf)?;  let cmd = buf.trim();  let mut cmds = cmd.split\_whitespace();  let cname = cmds.next();  let carg = cmds.next();  match cname {  Some("save") => {  if let Some(path) = carg {  let wtr = File::create(path)?;  serde\_json::to\_writer\_pretty(wtr, &scheduler.all\_tasks()).unwrap();  println!("Successfully save tasks.");  } else {  eprintln!("Save file path is empty.");  }  }  Some("log") => {  let duration = cmds.next();  let duration = duration.and\_then(|i| i.parse::<u64>().ok());  match (carg, duration) {  (Some(path), Some(duration)) => {  let mut wtr = File::create(path)?;  let mut buf\_time = Vec::<u8>::new();  let mut buf\_task = Vec::<u8>::new();  let end = scheduler.timer + duration;  scheduler.put\_time\_series(true, &mut buf\_time)?;  while scheduler.timer <= end {  scheduler.run\_tick();  scheduler.put\_task\_series(&mut buf\_task)?;  scheduler.put\_time\_series(false, &mut buf\_time)?;  }  wtr.write\_all(&buf\_time).unwrap();  wtr.write\_all(&buf\_task).unwrap();  }  \_ => {}  }  }  Some("clear") => {  scheduler.clear();  continue;  }  Some("exit") | Some("quit") => {  break;  }  Some("load") => {  if let Some(path) = carg {  let rdr = File::open(path)?;  let tasks = serde\_json::from\_reader(rdr).unwrap();  scheduler = Scheduler::new(tasks);  println!("Successfully load tasks.");  } else {  eprintln!("Load file path is empty.");  }  }  Some("display") => {  for task in scheduler.all\_tasks() {  println!("{:?}", task);  }  }  None => {  scheduler.run\_tick();  scheduler.put(&mut std::io::stdout())?;  std::io::stdout().flush()?;  }  \_ => continue,  }  }  Ok(())  }  **【结论与讨论】（结果、分析）**  结果：  1.初步了解了动态优先权调度的知识。 |
| **三、指导教师评语及成绩：** |
| **评语：**  **成绩： 指导教师签名：**  **批阅日期：** |