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/* Implements a first-come, first-served scheduler.
 *
 * Created by Henry Walker, 27 September 2004
 * Last modified by Janet Davis, 25 September 2010
 * Revised by Jerod Weinman, 10 August 2012
 */

#include <stdlib.h>
#include <stdio.h>
#include "scheduler.h"

/* The ready queue */
job_queue_t ready;

/* Initializes the ready queue. Call before any other functions. */
void ready_queue_init(void) {
    ready.first = NULL;
    ready.last = NULL;
}

/* Returns true or false, according to whether any jobs are waiting
 * in the ready queue.
 */
int ready_queue_empty(void) {
    return (ready.first == NULL);
}

/* Adds the specified job to the ready queue.
 *
 * Preconditions:
 *   job != NULL
 * Postconditions:
 *   Creates a new node for the job
 *   job is inserted at the end of the queue
 */
void ready_queue_insert(job_t* job) {
    job_queue_node_t* node
        = (job_queue_node_t *)malloc(sizeof(job_queue_node_t));

    if (!node) {
        perror("Unable to allocate job node");
        exit(EXIT_FAILURE);
    }

    /* copy event data to new node */
    node->job = job;

    /* insert node into ready queue*/
    node->next = NULL;
    if (ready_queue_empty()) {
        ready.first = node;
        ready.last = node;
    } else {
        ready.last->next = node; /* add after current last */
        ready.last = node;      /* make new node last */
    }
}

/* Removes and returns the job at the head of the ready queue.
 *
 * Postconditions:
 *   If ready_queue_empty(), returns NULL
 *   Otherwise, returns head job and frees the associated node
 */
job_t* ready_queue_select(void) {
    job_t* job;
    job_queue_node_t* old_node;

    /* if no jobs are ready, return NULL */

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    if (ready_queue_empty())
        return NULL;

    /* next job is at front of queue */
    job = ready.first->job;

    /* record node at front of queue */
    old_node = ready.first;
    ready.first = ready.first->next;

    /* check if queue is -now- empty */
    if (ready_queue_empty()) {
        ready.last = NULL; /* make last pointer consistent */
    }

    /* return old front of queue to memory pool */
    free(old_node);

    return job;
}

```