Being a Marker

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What do staff want of a marker?

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Meets deadlines. Late return reflects badly on everybody. So you must schedule your marking time!

Can follow a marking scheme. Even if you don't agree with it. But you may get a lot of discretion to invent the marking scheme, at least in fine details.
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What do students want of a marker?

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- Meets deadlines. Many students don't even look at their feedback. Those who do, really care.
- Can follow a marking scheme. Students talk to their friends!
- Gives helpful feedback. Explains what doesn’t work, why it doesn’t work, and how it should work.
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Last year, before doing it, I asked the class to tell me if they actually wanted feedback. How many do you think requested it?
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So, much of your work may be wasted. But

- you’re being paid for it;
- some students really do care and want your feedback.
Example

For several years, I taught the UG3 Operating Systems course. There was a practical exercise, which involved messing around with concurrency primitives inside a Linux kernel.

As I told the students, “you can do this practical by writing 15 lines of code . . . but finding the right 15 lines is the hard part”.

Your task is to produce a module that starts a kernel thread that takes action to alleviate this problem, by preventing busy-waiting processes from executing while there appears to be user activity going on. On the other hand, the busy-waiting process should not be completely starved: it should get some run time, even if the user is typing continuously. (The user will necessarily be delayed while the busy process is running, but that’s too bad.)

To keep things simple, you should stick with the worker scheduling policy of just doing its work every ten seconds. The worker’s work should be as follows:
if a key has been pressed in the last ten seconds (i.e. since the last time round), any excessively busy process should be prevented from executing during the next minute (i.e. six times round).
Extract from the marking scheme

10pt for stopping and resuming tasks in some way
- stopping busy tasks : up to 4pt
- resuming tasks after 60sec : up to 6pt
- doing it in a nasty way : up to -3pt
- using send_sig or force_sig to send SIGCONT instead of kill_proc: up to -3pt
- possibility of starvation of the busy task : -2pt
- stopping the busy tasks too early after resume : -1pt
- not detecting if the busy tasks are already dead or woken up or already stopped : up to -2pt

8pt for implementing the two criteria for a busy task
- implementing only the first criteria : -5pt
- implementing only the second criteria : -3pt
- sth wrong with the condition eg. rounding error in dividing int numbers, || on the two conditions instead of && : up to -2pt
- using current_kernel_time() instead of do_posix_clock_monotonic_gettime(struct timespec*) : -1pt
- traversing the task list improperly : -3pt

2pt for having the module clean up properly ie. starting previously stopped busy tasks
* add 4pt if doing more than busy process.
* add 6pt more if solution actually works (some criterion for a busy process implemented, stopping and resuming tasks) for one busy process when run on an UP machine
- not distinguishing between different stopping times for busy tasks : -2pt

10pt for SMP safety:
* A solution is considered to be "SMP safe" if it is blocking the task list(acquiring task_lock) when traversing it, stopping and resuming processes in a SMP safe way, and there is no possibility of occurring a deadlock when run on SMP machine

- missing keyboard presses (e.g. calling irq_stat more than once in a row... actually this also the case for UP as hardware interrupts can preempt our module, but I didn't subtract points for that) : -1pt

Bonus 5pt max for coding style if the solution works at least for one process on an UP machine
- global variables are declared static : 0.5pt
- meaningful names of variables : up to 1pt
- constants as macro definitions #define : 0.5pt
- nicely indented, structured code ie. defining some functions, not using gotos, not mixing too much variables definitions with the code : up to 1pt
- defining struct for each blocked process state instead of using eg. 3 separate arrays : 0.5pt
- useful comments when necessary : up to 2pt
Many people had problems when writing correct criteria for being a busy task. Very common were rounding errors such as:

```c
float perc;
int time_in_kernel, time_running;
perc = (time_in_kernel / time_running) * 100;
```

This will always assign 0.0 to the perc variable as `time_in_kernel` always less than `time_running` and the arithmetic operation \( \text{time_in_kernel} / \text{time_running} \) will be done in integers returning a value only the integer part of this operation without the reminder. Besides using floating point numbers inside the kernel is highly discouraged and almost always unnecessary, as it was in this case. Also some people used `||` instead of `&&` to join the two conditions of being a busy task that made any task that spent more than one second in the kernel to be considered busy. Most of the time there are many such tasks, but they shouldn’t be considered busy.
Q3.

34pt

could stop busy tasks, resume tasks after 60sec, implement the two
criteria for a busy task, works for more than one busy process on an
UP machine, but it does not have the module clean up properly
ie. starting previously stopped busy tasks, not SMP safety (may think
about blocking the task list). Additional 2pt for good coding style.
Q3.

29pt could stop busy tasks, resume tasks after 60sec, implement the two criteria for a busy task, works for more than one busy process on an UP machine. It has the module clean up properly, but not SMP safety (may think about blocking the task list). Additional 2pt for good coding style. The code has a bug: if the number of busy tasks is more than 6, the program will crash. You set "int pidsToKill[6]" but there is not any boundary check while you fill the array.