Assignment 2

Please complete the report and upload the corresponding code. The file required for submission of this assignment include:

1. Submit `report.pdf` through Blackboard
2. Finish and push the code to GitLab

The GitLab link of assignment2: https://mirrors.sustech.edu.cn/git/operating-systems/asterinas_labs/assignment2_{Your student ID}

How to push code to GitLab, please refer to `Lab/作业提交配置手册.pdf` (Note: section 5 in the PDF file is no longer used in the semester)

1. **[20 pts]** Read Chapter 2 of "Three Easy Pieces" (https://pages.cs.wisc.edu/~remzi/OSTEP/intro.pdf). Answer the following questions:

   (1) What are the "three easy pieces" of operating systems? Explain each of them with your own words.

   (2) How do these "three easy pieces" map to the chapters in the "dinosaur book" (Operating System Concepts)?

2. **[15 pts]** Read Chapter 6 of "Three Easy Pieces" (https://pages.cs.wisc.edu/~remzi/OSTEP/cpu-mechanisms.pdf) and explain what happens during **context switch** in detail?

3. **[20 pts]** Read slides "L03 Processes" and answer the following questions:

   (1) Explain what happens when the kernel handles the fork() system call (hint: your answer should include the system call mechanism, PCB, address space, CPU scheduler, context switch, return values of the system call).

   (2) Explain what happens when the kernel handles the exit() system call (hint: your answer should include discussion on the zombie state and how it is related to the wait() system call).

4. **[15 pts]** Describe the life cycle of a process (hint: explain the reasons for process state transitions).

5. **[30 pts] [Programming]** Kernel callback mechanism.

   For the description of this question, please refer to `README.md` in the code repository.