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Dear candidate,

Please answer the following questions as best as possible, without recurring to standard libraries or external code.

**Question 1:**
How do you find the element in the middle of a singly linked list? Propose a solution using any programming language of your knowledge. Important: do not use standard libraries.

**Question 2:**
The company Enterprise Systems LLC has a legacy system developed 5 years ago, and a lot of clients are using it. Lately, the stakeholders came out with a whole new set of features to the product in order to open a new market branch. The software engineers evaluated the legacy software and concluded that it is excessively coupled (*maccarronic code*). In your opinion, what's the best strategy: revamp the software ou evolve the legacy code? Elaborate.

**Question 3:**
There is a set of jobs sent to a machine along the days, each having different processing times. Assume that the processing intervals are *[i, j)*, where *i* and *j* correspond to milliseconds. Given a long list of job processing intervals like this, the manager wants to know what is the peak time. Propose the best solution you can for the problem.

**Question 4:**
Using any language of your choice, propose a function that matches a pattern and an input. The pattern is composed of alphanumeric characters (meaning simple comparison with the input), the '.' means that any character in the input is allowed at the position, and '*' means any repetition of the previous character is allowed, including none. The following test cases should pass:

```
assert match('a', 'a') == True
assert match('a', 'a*') == True
assert match('', 'a*') == True
assert match('', 'a*a') == False
assert match('a', '.') == True
assert match('a', '.*') == True
assert match('ab', 'a*b*') == True
assert match('ab', 'a*.*b') == True
assert match('ab', 'a*c') == False
```

Good luck!

Guilherme Balena Versiani.