Homework #2 Manual Program Repair

In this assignment, we are going **to manually find the memory deallocation error and fix it.** In the HW2 file, there are five source codes (e.g., **bug_1.c ~ bug_5.c**), where each code has one of the memory deallocation errors (e.g., memory leak, double free, and use-after-free).

In this assignment, you should **(1) choose one of the memory deallocation errors in each code and (2) generate the minimum correct patch for fixing the memory deallocation error**.
(You have to fill in the blanks in the attached Excel file to answer these questions for each code.)

Submission

- **HW2_studentid_studentname.xlsx (HW2_2025xxxxxx_gildonghong)**
- **Due date: 2025-11-18, 23:59:00**
- **No late submission. (score = 0)**

I provide an example of how each question should be answered for the following toy code. Please read this example, and if you have any questions, please email TA.

```
1 p = malloc(1);
2 if(…) {
3     q = malloc(2);
4
5 }
6 Else
7     q = p;
8 … // use q
9 Free(p);
10 Free(q);
```

(1). What kind of memory deallocation error is there in the source code? (0.5p)
1. memory leak **2. double free** 3. use-after-free

(2). What is(are) the minimum correct patch(es) for fixing the memory deallocation error(s)? (1.5p)
(The minimum patch is the patch code with the smallest code change that corrects the root cause.)
Insert free(p) at line 4 and remove the free(p) at line 9.

	Problem 1	Problem 2
Example.c	2	**Insert free(p) at line 4 and remove the free(p) at line 9.**

###[bug_1.c ~ bug_5.c]

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###[bug_1.c ~ bug_5.c]

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