Lab 1: Lucky 111

Professor Patt loves the number 7. As a computer man he would represent 7 in binary 111. That is Patt's favorate binary pattern, called Lucky 111.

Your job is to write a program to judge whether a 16-bit value contains that pattern (three consecutive 1's). The following examples satisfy this condition so Patt loves them:

```
0000 0000 0000 0111
0011 1001 1010 1101
1111 1111 1111 1111
```

The following examples do not satisfy this condition:

```
0000 0000 0000 0000
0110 1101 1011 0110
1010 1010 1010 1010
```

Implemention Details

- You are required to write in **LC-3 machine codes** (0's and 1's).
- Your program should start at x3000, which means the first instruction of your program is located in position x3000.
- The input 16-bit value is located in memory location x3100. Your program should load the value and then examinate it.
- If the input value satisfies, then set R2 to 1. Otherwise, set R2 to 0.
- Your program must halt after examining the value. The halt instruction is `1111 0000 0010 0101`.

Grading

Lab 1 takes 4% of the total score, consisting of Check part (50%) and Report part (50%).

Check part (50%)

- Find a TA to check your code in person. TAs may ask you questions when grading your lab assignment. You will get 100%, 80% or 60% of the checking score according to your response.
- You can try again if you fail in checking, but there will be a penalty of -20% (of checking part) for each try.
- We suggest you to run your program on PTA to check by yourself before you find a TA. The link to this lab on PTA will be available later.
- We suggest you to write enough comments in your code so that you will be aware of what's going on in your program and confident to answer TA's questions.

Report part (50%)

- English report should be concise and carrying main ideas. Try to use the report to convince TAs that you complete the task by yourself.
- Your lab report should *at least* contains the following contents:
    - Your algorithm. To make it clear, you can use figures, tables or any other easy-to-understand appearance.
    - Essential parts of your code with sufficient comments. Please only select the most important code phases and explain them.
    - The questions that TA asked you, and answers.
- No more than 2 A4 pages. No template provided. Be sure to make it readable.

Penalty

- **Wrong Answer**: -20% of Check part each time.
- **Delay**: -20% of the corresponding part per day.
- **Cheating**: -100% of this lab. Additionly, -10% of the final score of this course.