PIC 10A 2B

TA: Bumsu Kim

UCLA

Today…

- Control Flows
  - The `while` loop

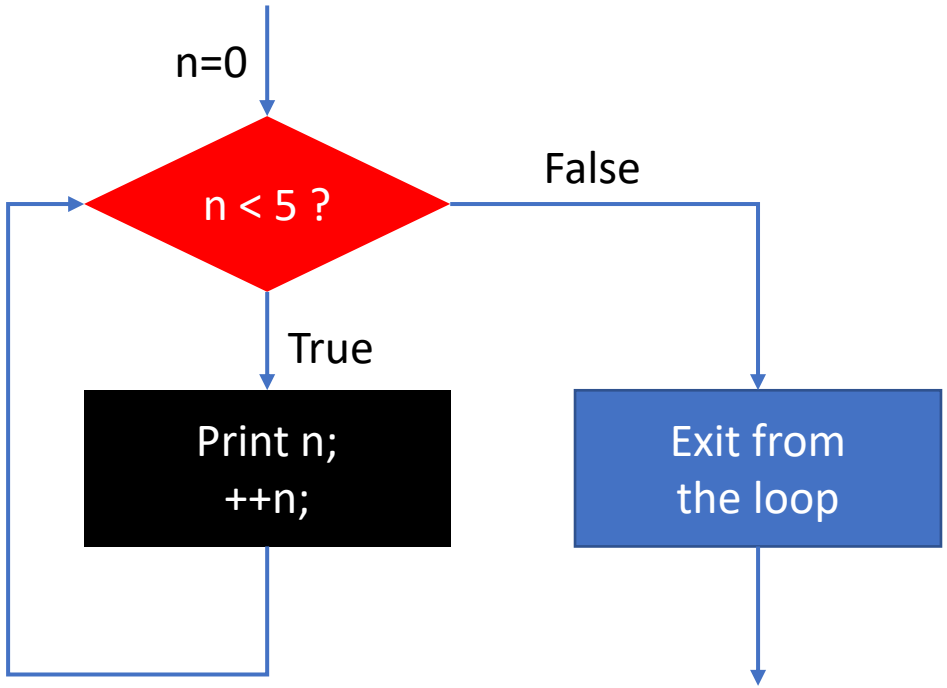
- Exercise: Grade Calculator
  - I/O, Nested If-else, While loop, and some additional challenges

UCLA

Control Flow

- If (and if-else) statements can be used to evaluate a condition, and act differently according to the current state

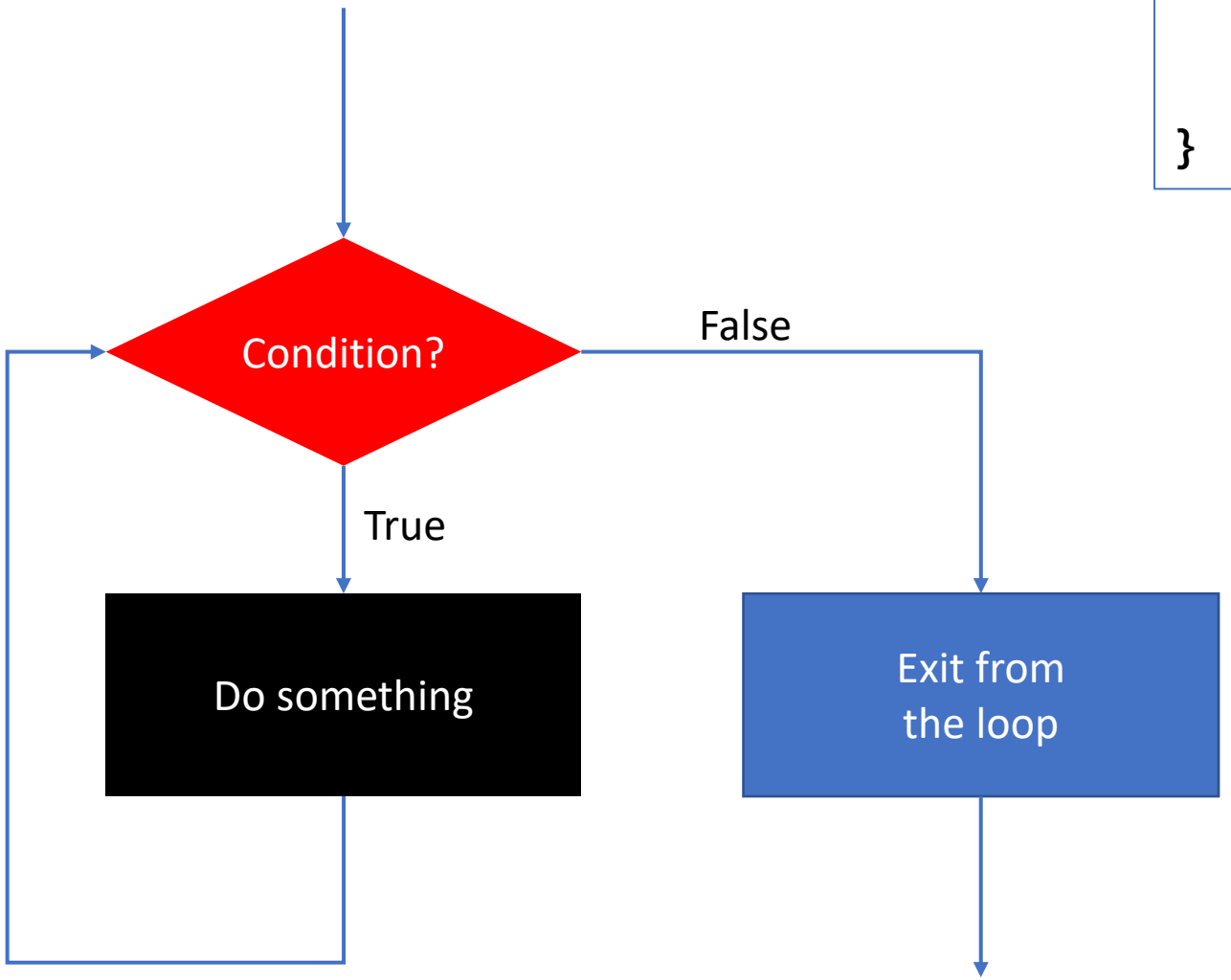
- Loops can be used to move back to a certain point of a program
  - For instance, we can print numbers from 0 to 4 using the following flow chart:



UCLA

The `while` loop

- Flow chart (while)



Syntax:

```
while (/* Condition */) {
    //Do stuffs here
    //Can be multiple lines
}
```

e.g. To print out numbers from 0 to 4:

```
int n = 0;
while (n < 5) {
     cout << n << endl;
     ++n;
}
```

UCLA

Exercise: Grade Calculator

- Write a program that will calculate a student's final score in some class on the following dual grading system:
- Assume that there will be **N** homework assignments total, and the lowest homework score will be dropped.

User inputs **N**

Scheme A	Scheme B
Midterm Exam 30%	Midterm exam score dropped
Final Exam 40%	Final Exam 70%
Homework 30%	Homework 30%

- The maximum of the two scores obtained from the two schemes will be the final score
- In addition to printing the final score, you should also determine the letter grade based on the following scale: `90 <= A <= 100, 80 <= B < 90, 70 <= C < 80, 60 <= D < 70, 0 <= F < 60.`
- Input and output should be exactly of the following format:

```
Please enter the midterm score (0 - 100): 84.0
Please enter the final exam score (0 - 100): 99.0
Please enter the number of homework assignments (3 - 10): 3
Please enter the homework 0 score (0 - 100): 44.0
Please enter the homework 1 score (0 - 100): 55.0
Please enter the homework 2 score (0 - 100): 66.0
Your final score based on Scheme A is 82.95
Your final score based on Scheme B is 87.45
 Your final score is 87.45
Your course grade is B
```

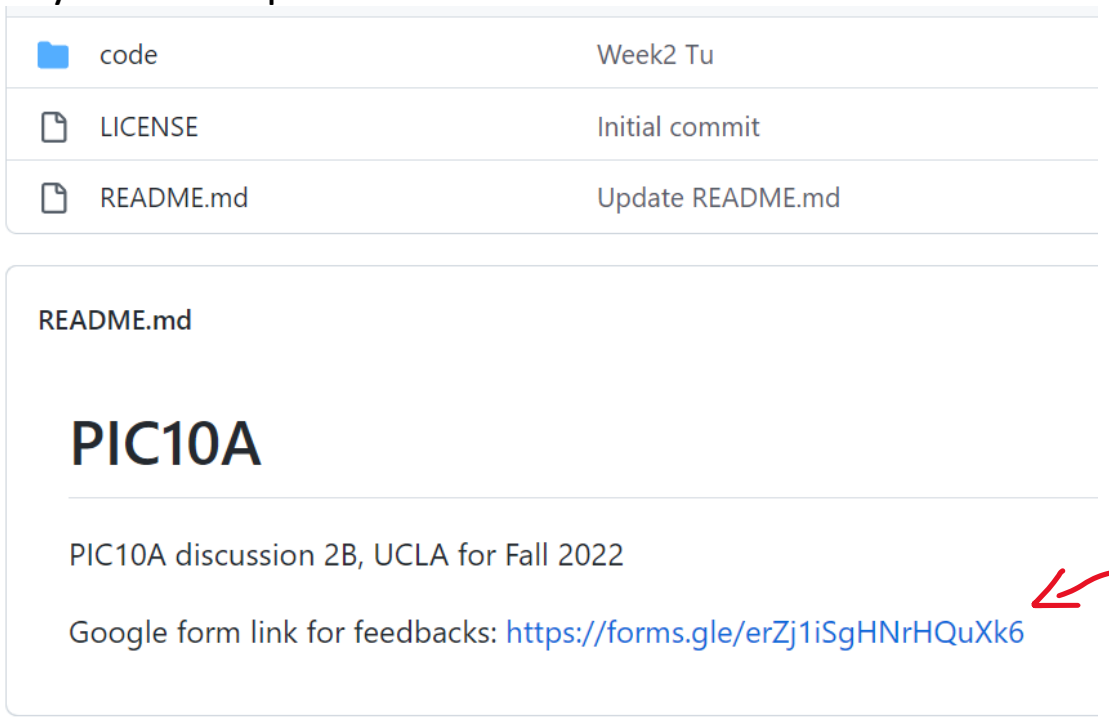
Q: Can we replace "if - elseif - else" clauses with *one single expression*?
(HINT: consider Boolean expressions as numeric values)

UCLA

Your Feedback is welcome

- Don’t hesitate to give a feedback on the discussion
- Use the link on my Github repo, or the link below:
  - https://forms.gle/erZj1iSgHNrHQuXk6

My Github repo on the web looks like:



UCLA