Java for Android:
if Statements
Code Walk Through

Mileage Calculator

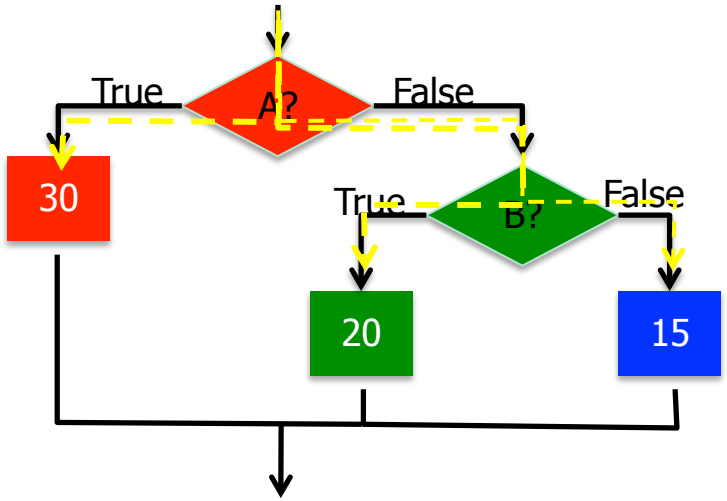
- User provides
  - Current weekly mileage
  - Race distance
  - Weeks until the race

if statement to determine race distance

```
public void process(){
     double currentMileage, goalMileage, temp;
     int weeks, neededWeeks;
     char raceDistl

     //Obtain values from 'Android' UI
     currentMileage = out.getWeekelyMileage();
     raceDist = out.getDesiredDistance();
     weeks = out.getWeeks();

     if (raceDist == 'A'){
          goalMileage = 30;
     }
     else if (raceDist == 'B'){
          goalMileage = 20;
     }
     else {
          goalMileage = 15;
     }
```



Calculate the number of weeks needed

- Each week the runner can increase their total by 10%
- Week 1: run current mileage plus an increase of 10%

```
goalMileage = currentMileage + (currentMileage * 0.10)
```

= currentMileage * 1.10

- Week 2: increase mileage by another 10%

```
goalMileage = (currentMileage  * 1.10)* 1.10
```

= currentMileage * 1.10^2

- Week k: increase mileage by another 10%

```
goalMileage = currentMileage  * 1.10^k
```

- We have determined the goal mileage (`goalMileage`) from the previous if statement block. Calculate the number of weeks needed to reach that goal (`k`)

Calculate the number of weeks needed

$$goalMileage = currentMileage * 1.10^{k}$$

$$goalMileage/currentMileage = 1.10^{k}$$

$$\log_{1.10}(goalMileage/currentMileage) = \log_{1.10}(1.10^{k})$$

$$\log_{1.10}(goalMileage/currentMileage) = k$$

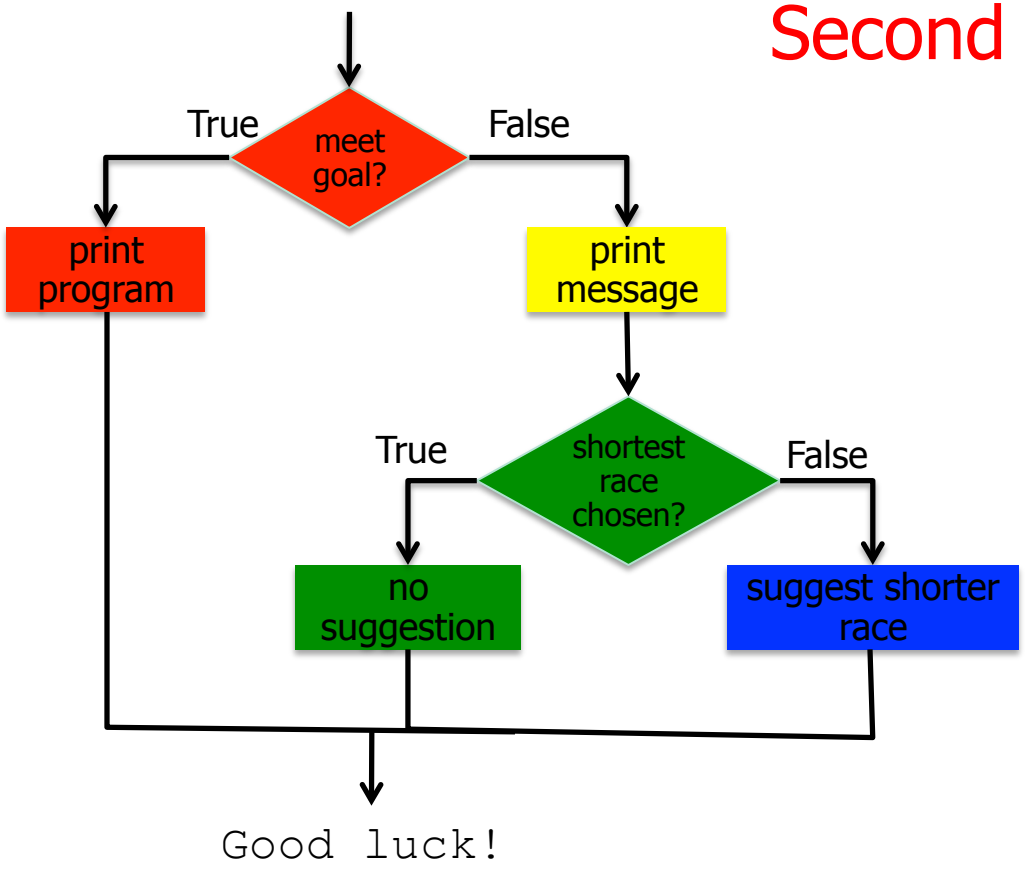
Take the ceiling of k (the next highest whole number) as the number of weeks needed to safely increase your mileage from current to goal.

Returning to our code

```
    temp = Math.log((goalMileage/currentMileage))/Math.log(1.1); //allows for weekly increase of 10%
    neededWeeks = (int)Math.ceil(temp);

    if (neededWeeks <= weeks){ //they have time to complete the program
        out.println("You have time to meet your goal!  Increasing your weekly mileage by approximately 10% per week");
        out.println("you will achieve the suggested weekly total of " + goalMileage + " miles before your race.");
    }
    else{
        out.println("You do not have enough time to complete this program. ");
        out.print("Consider selecting a later race");
        if  (raceDist =='C'){
             out.println(".")
        }
        else {
            out.println(" or switching to a shorter race.");
        }
    }
    out.println("Good luck!" + neededWeeks);
}
```

Second if block



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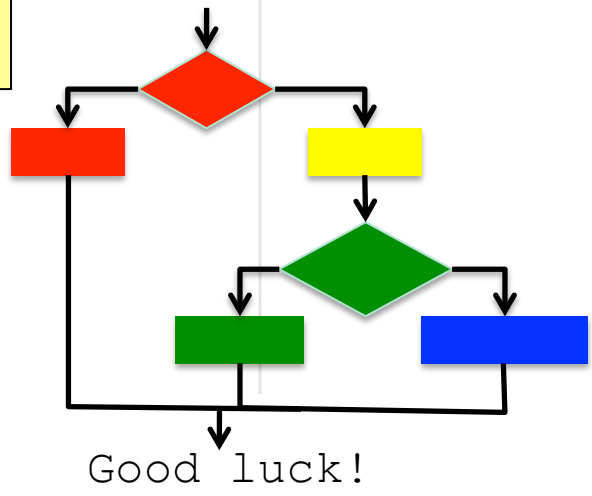

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