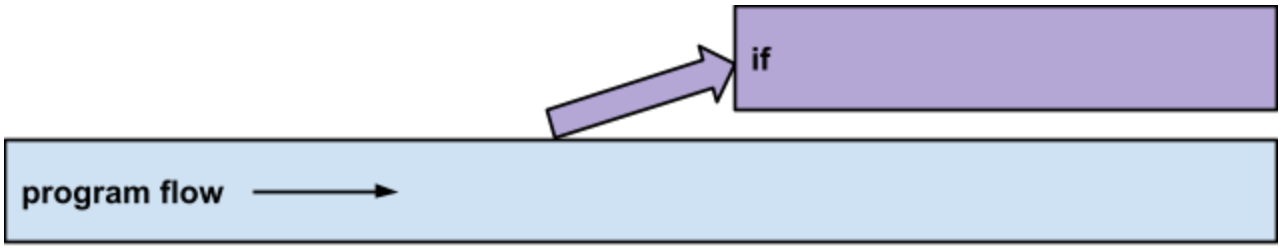
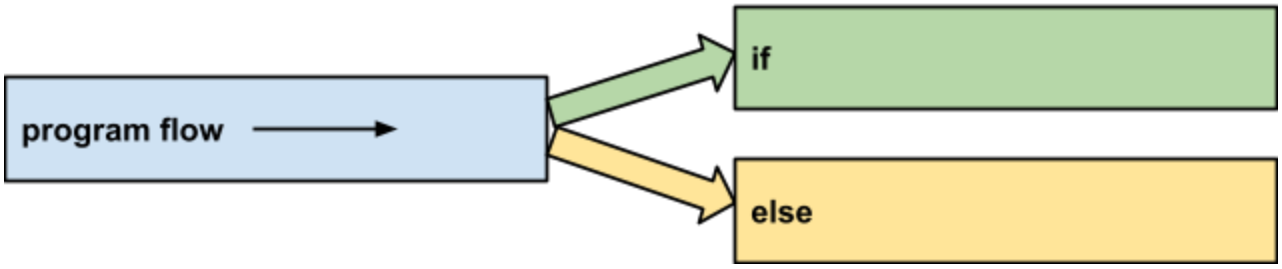
# To If, or Not to If

**Corresponding Material**
Programming with Karel, Lesson 11, Lesson 12, Lesson 13
Exercise: Is There a Ball?, Right Side Up, Random Hurdles

## Discussion

Understanding the difference between if and if/else can be a little difficult at first. Using 'if' only causes a change in program if a certain condition is true -- if it's not true, the program flow continues uninterrupted. If/else, however, forces your program to choose between paths.




## Class Exercise

It may seem that there is not a significant difference between if and if/else, but there can be some significant (and unintended) consequences if you use the wrong conditional. For example, say you're trying to decide whether to eat or sleep:

```
if I am hungry
    eat food
if I am sleepy
    take a nap
```

```
if I am hungry
eat food
else
    take a nap
```

The code on the left may seem reasonable… but what if you're both hungry *and* sleepy? You'll end up both taking a nap and eating! This code on the right does what we need it to do.

Circle the correct conditional for Karel in each situation below:

| | |
|---|---|
| If there is a ball present, Karel should take it. If there is no ball present, Karel should turn around. | if<br>if, if<br>if/else |
| If there is a ball present, Karel should take it. If the front is clear, Karel should move forward. | if<br>if, if<br>if/else |
| If there is a ball, Karel should take it. Then Karel should move forward. | if<br>if, if<br>if/else |
| If the front is clear, Karel should move. Otherwise, Karel should turn around | if<br>if, if<br>if/else |