Definition Time!

- What is a *strategy*?

From Google:

```
strategy
/strəˈdʒi/ (noun)
Noun
1. A plan of action or policy designed to achieve a major or overall aim.
2. The art of planning and directing overall military operations and movements in a war or battle.
```

Synonyms
strategies - tactics

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“I suggest a new strategy. R2: let the Wookiee win.”

Definition Time!

- What is an algorithm?

From Google:

```
al·go·rithm
/ˈalɡəˌrithəm/
Noun
A process or set of rules to be followed in calculations or other problem-solving operations, esp. by a computer.
```
Let’s Take a trip

- Suppose I wanted to go to Washington DC.

- Let’s get directions from google.
  - [http://maps.google.com](http://maps.google.com)
  
  - *By default it will show me the shortest time.*
    - In this case it is 993 miles and Time 14 hours 55 minutes.

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Let’s Take A Trip

- Wait! This route has tolls?

- I’m not going to pay tolls. Let’s set the options to avoid tolls.
  - *Now it is 1,040 miles and Time 15 hours 39 minutes.*

- Let’s take the scenic route and avoid highways as well.
  - Now it is 1,042 miles and Time 21 hours 19 minutes.
Let’s Take A Trip

- Maybe I should walk instead of driving.
  - I’ll select that option:
    - In this case it is 940 miles and Time 310 hours.

- That’s too long, perhaps I’ll bike.
  - I’ll select that option:
    - In this case it is 1,124 miles and Time 94 hours.

What’s the point of this?

- Each set of directions I received took me from the same starting position (Cedar Falls) to the same ending position (Washington D.C.)

- The difference was the strategy that I selected to accomplish getting there.

- The programmers programmed each with a different algorithm to create the directions.
The Strategy design pattern

■ Problem:
  - In some situations you may have different approaches for implementing the same method that you want to use based on the situation.
  - In other words, you program needs to respond differently to a method under different situations.
  - Can be used in a situation where you wish to change the algorithms employed at different times.

■ Solution:

Create a Strategy class with a common interface that has sub-classes that implement the various algorithms.

Source: http://java-x.blogspot.com/2006/12/implementing-strategy-pattern-in-java.html
The Strategy design pattern

- Consequences:
  - Enhances encapsulation, by implementing each algorithm in its own class.
  - Completely overhauling your program is easier, simply employ a new Strategy.
  - Allows for clearly understandable code by modeling a family of approaches that can all be used to solve the same problem.
  - Simplifies maintenance as new strategies can be easily added by creating a new subclass and does not affect existing code.

One online example:

Does anyone know Asimov’s Three Laws of Robotics?

A robot may not injure a human being or, through inaction, allow a human being to come to harm.

A robot must obey the orders given to it by human beings, except where such orders would conflict with the First Law.

A robot must protect its own existence as long as such protection does not conflict with the First or Second Laws.

- [http://www.oodesign.com/strategy-pattern.html](http://www.oodesign.com/strategy-pattern.html)