

You have already learned that an algorithm is a sequence of steps used in solving pro-grammatic problems. Look at the example algorithm on the class web site and write an algorithm for making a cup of coffee (2 points).

Inputs: Coffee cup, coffee filter, coffee grounds, coffee maker, water
Outputs: Cup of coffee with plenty of $C_8H_{10}N_4O_2$

1. Place coffee filter in coffee maker.
2. Place coffee grounds in coffee filter.
3. Add water to coffee maker.
4. Turn on coffee maker to heat water.
5. Insert coffee pot into coffee maker.
6. Pour a cup of coffee after coffee is brewed.

Now write an algorithm for going to class (assume you start from home - 2 points).

Inputs: Eggs, juice, myself, plate, teflon pan, tortillas, salsa
Outputs: An alert, helpful instructor

1. Fry eggs in a teflon pan.
2. Cover eggs in salsa.
3. Heat tortillas and serve all food on plate.
4. Eat!
5. Drink juice.
6. Walk to CS Building via McNutt Tunnel.

Here is an algorithm that finds the slope of the line that connects points $P = (x_1, y_1)$ and $Q = (x_2, y_2)$.

Inputs: A point P and a point Q .

Output: The slope of the line connecting P and Q .

1. Let $m = \frac{dy}{dx}$.
2. Let $dx = x_1 - x_2$.
3. Let $dy = y_1 - y_2$.
4. m now contains the slope. Return m .

There is a bug in this algorithm. What is it? How can you fix it? (1 point)

The calculation in step 1 uses dx and dy , which are undefined at that point of time. Step 1 needs to be after step 3.

Read the CS 54 Style Guide. Make sure you understand all of it before continuing.

Kathy just wrote her first program for CS 54. The code is as follows:

```
#include <iostream>
using namespace std;

int main()
{
    cout<<"Hello, world!"<<endl;
    return 0;
}
```

How many things can you find wrong with Kathy's style? What section(s) in the CS 54 Style Guide should she reference to learn more about the rule(s) she violated? (2 points)

- Braces should not be indented (3.2).
- `cout` line needs spaces between operators (3.3).
- No file comments (4.2).

Paul is writing a backgammon program and is writing code to retrieve the value of the dice, sum the values, and take the difference of the values of the dice. Here is his code (assume that `dice1` and `dice2` already have the dice values from somewhere else):

```
int d1,d2;
int d,s;
d1=dice1;
d2=dice2;
s=d1+d2;
d=d1-d2;
```

What is wrong with Paul's coding style? What section(s) in the CS 54 Style Guide should he reference to learn more about the rule(s) he violated? (2 points)

- Variable names make no sense. He should use a variable naming convention (2.1).
- Code needs spaces between operators (3.3).
- No in function comments explaining what this code does (4.3).