



Intro to Programming

Python Programming Workshop



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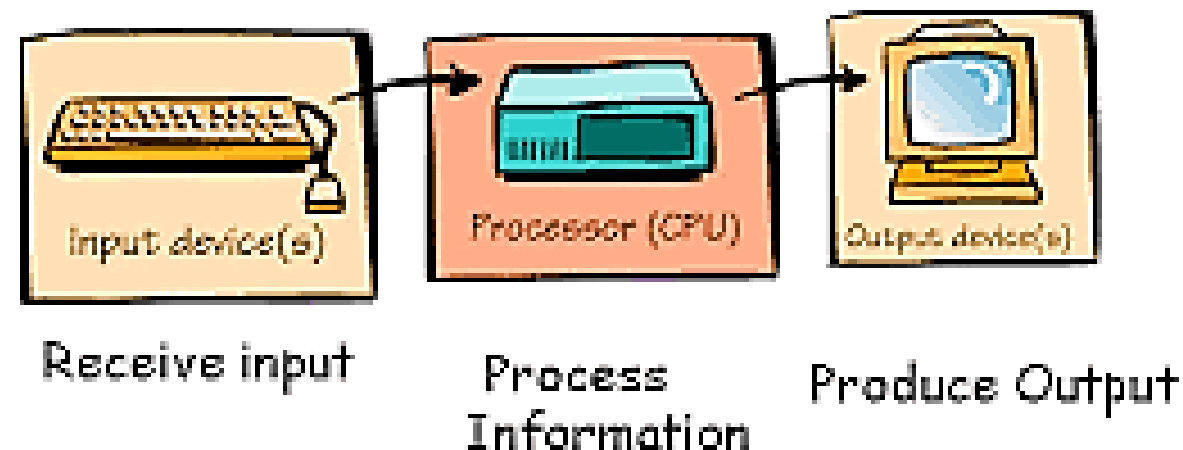
Understanding Computers

- A computer system consists of **Hardware** and **Software**
 - Hardware: All the physical devices associated with a computer e.g. Keyboard, Mouse, Speakers
 - Software: Set of computer instructions that tell the hardware what to do e.g. MS Word, Notepad

Understanding Computers

- Together hardware and software accomplish three major operations:

What Computers Do



Programs & Software

- A **program** or **algorithm** is a sequence of instructions to perform a specific task. Consider the example of baking a cake

Programs & Software

Chocolate Nut Cake Recipe
=
Algorithm for making
Chocolate Nut Cake

Chocolate nut cake (Serves 6-8)



Programs & Software

- A **program** or **algorithm** is a sequence of instructions to perform a task. Consider the example of baking a cake
- **Software** is a bundled collection of one or more programs, so typically a software program will have many features.

Structures of Programming Logic

- Any program, no matter how complicated, can be constructed using one or more of only 3 structures:
 - Sequence
 - Selection
 - Iteration / Repetition / Loop

Structures of Programming Logic

- Sequence: Instructions are written and executed in sequence (step by step, one after the other)
 - Example: Walk Home from School

```
1. Walk straight from school until you reach the main road.  
2. Turn left on the main road.  
3. Continue straight until you see your street, then turn right to  
   reach your house.
```

Structures of Programming Logic

- Sequence: Instructions are written and executed in sequence (step by step, one after the other)
 - Example: Walk Home from School

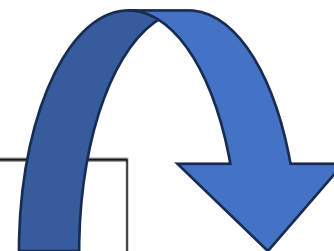
```
1. Walk straight from school until you reach the main road.  
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Pseudocode

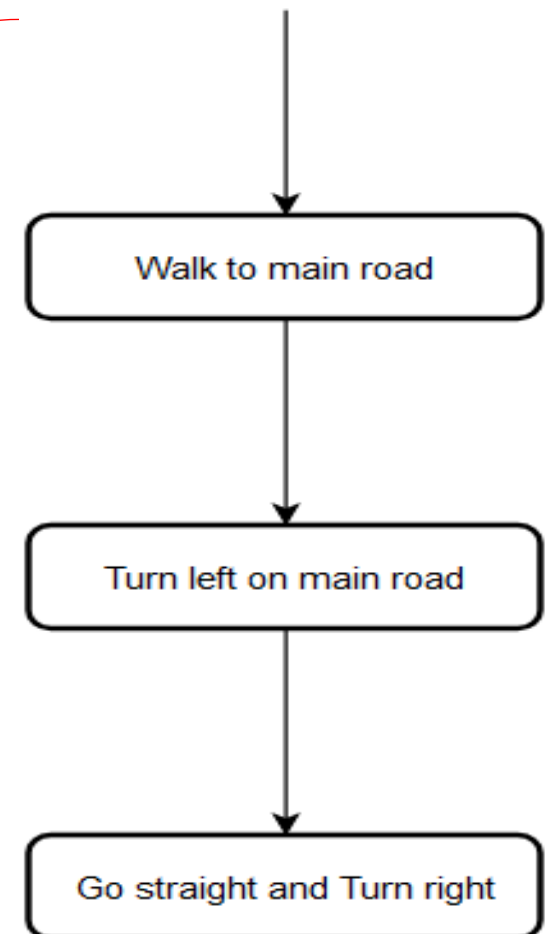
Structures of Programming Logic

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Flow-Chart



Structures of Programming Logic

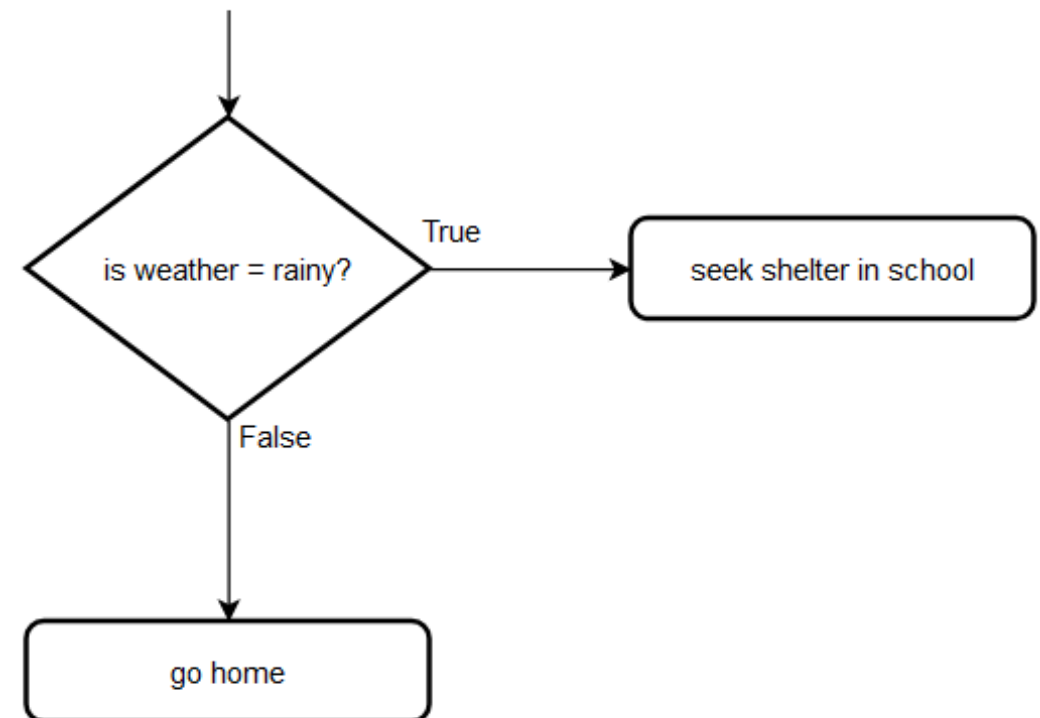
- Selection: Execution of instructions based on specific conditions
 - Example: Walk Home from School

```
1. If weather is "rainy" then  
2.     Seek shelter in school  
3. else  
4.     Walk home
```


Structures of Programming Logic

- Selection: Execution of instructions based on specific conditions
 - Example: Walk Home from School

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Structures of Programming Logic

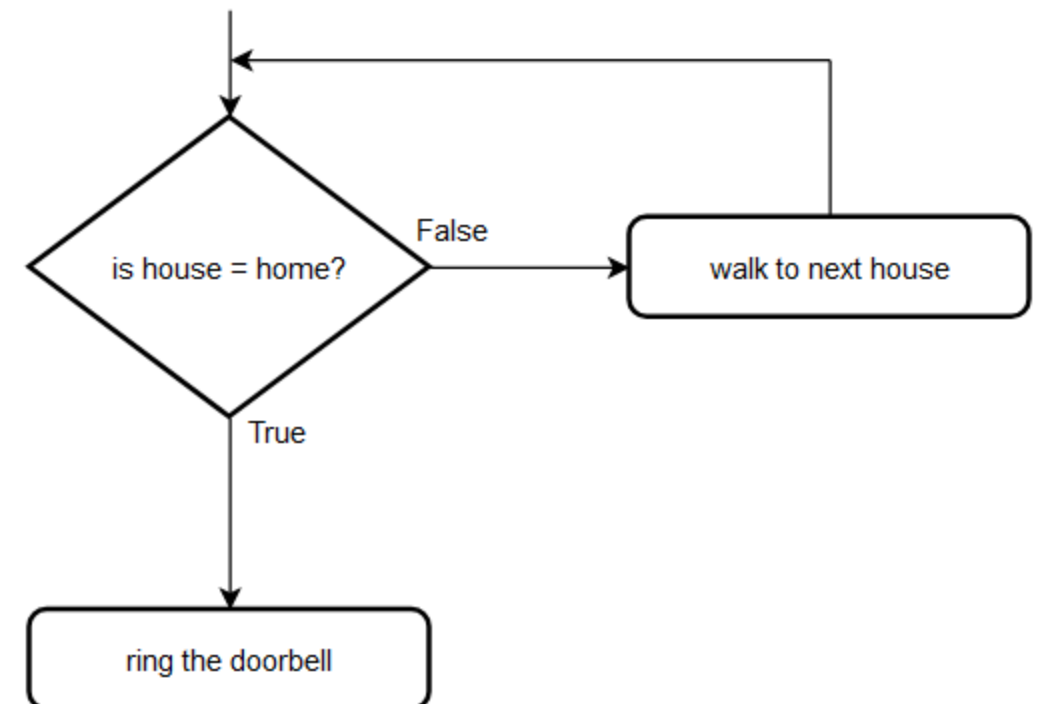
- Iteration: Execution of a block of instructions multiple times based on specific conditions.
 - Example: Walk Home from School

```
1. While house is not your house  
2.     Walk to the next house on the street  
3. Ring the doorbell
```

Structures of Programming Logic

- Iteration: Execution of a block of instructions multiple times based on specific conditions.
 - Example: Walk Home from School

```
1. While house is not your house
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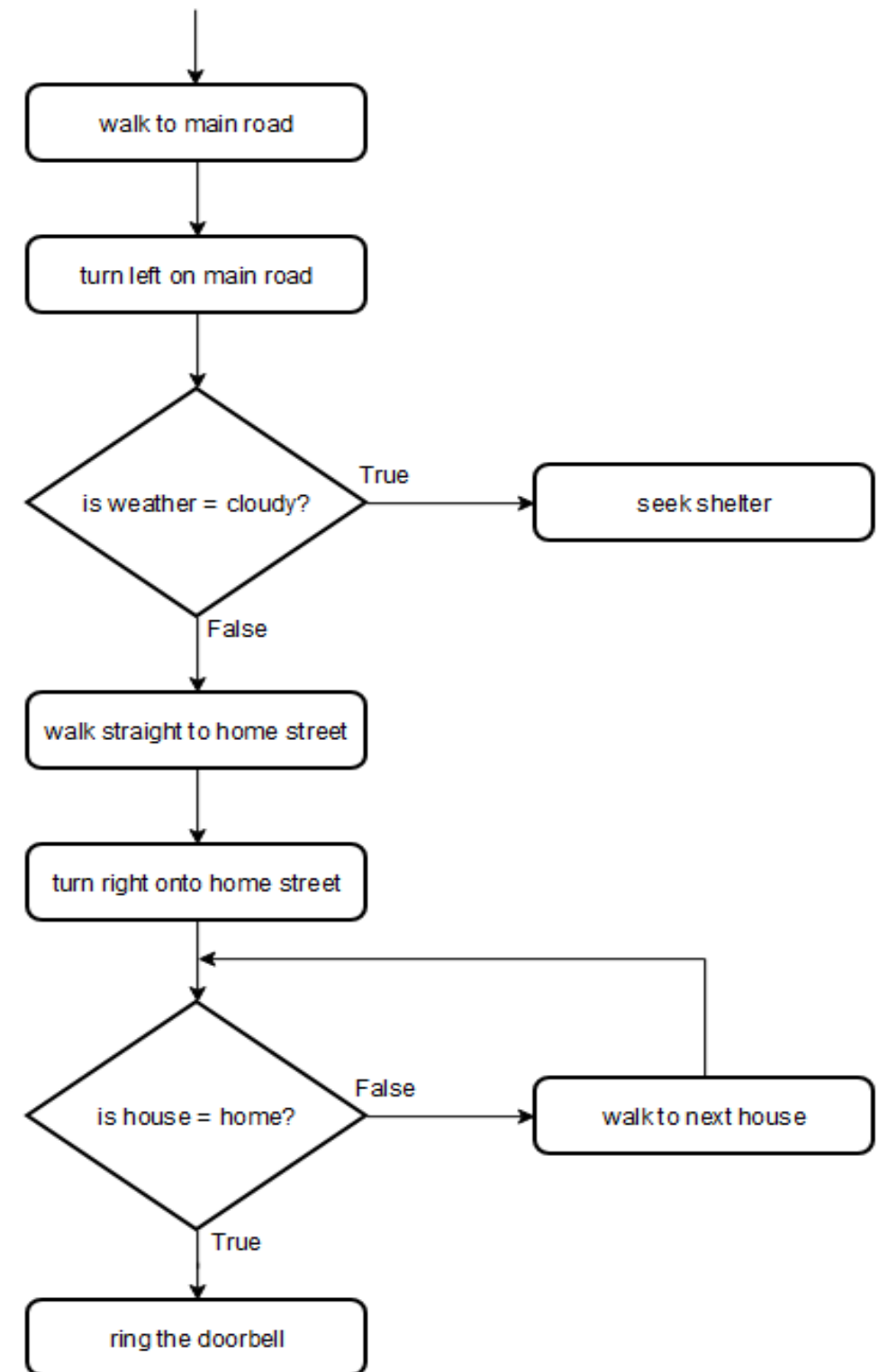


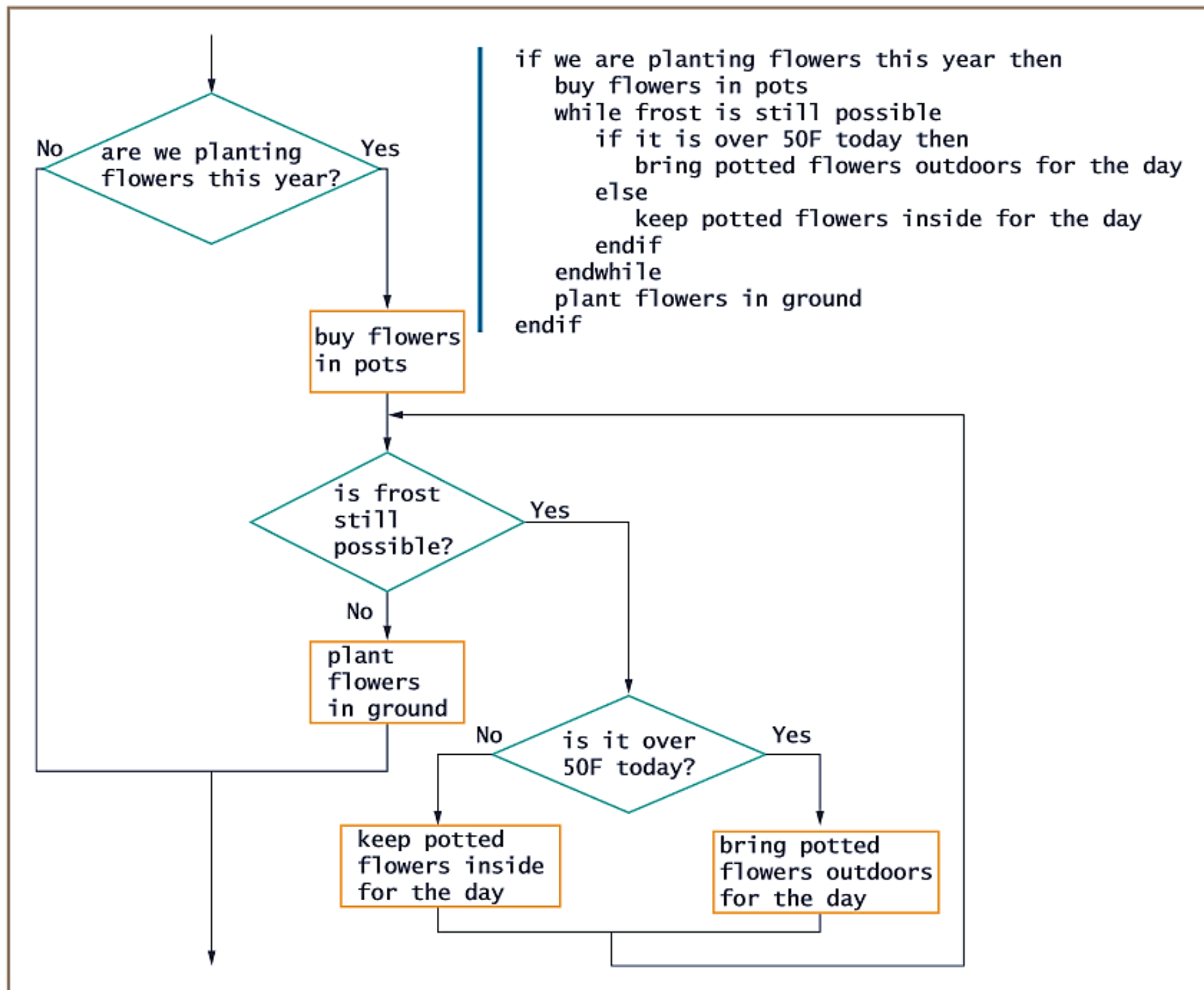
Combining Logic

```
1. Walk straight from school until you reach the main road.
2. Turn left on the main road.
3. If weather is "cloudy" then
4.     Seek shelter
5. else
6.     Continue straight until you see your street
7.     turn right onto your street
8.     While house is not your house
9.         Walk to the next house on the street
10.    Ring the doorbell
```


Combining Logic

```
1. Walk straight from school until you reach the main road.  
2. Turn left on the main road.  
3. If weather is "cloudy" then  
4.     Seek shelter  
5. else  
6.     Continue straight until you see your street  
7.     turn right onto your street  
8.     While house is not your house  
9.         Walk to the next house on the street  
10.    Ring the doorbell
```





CLOSING