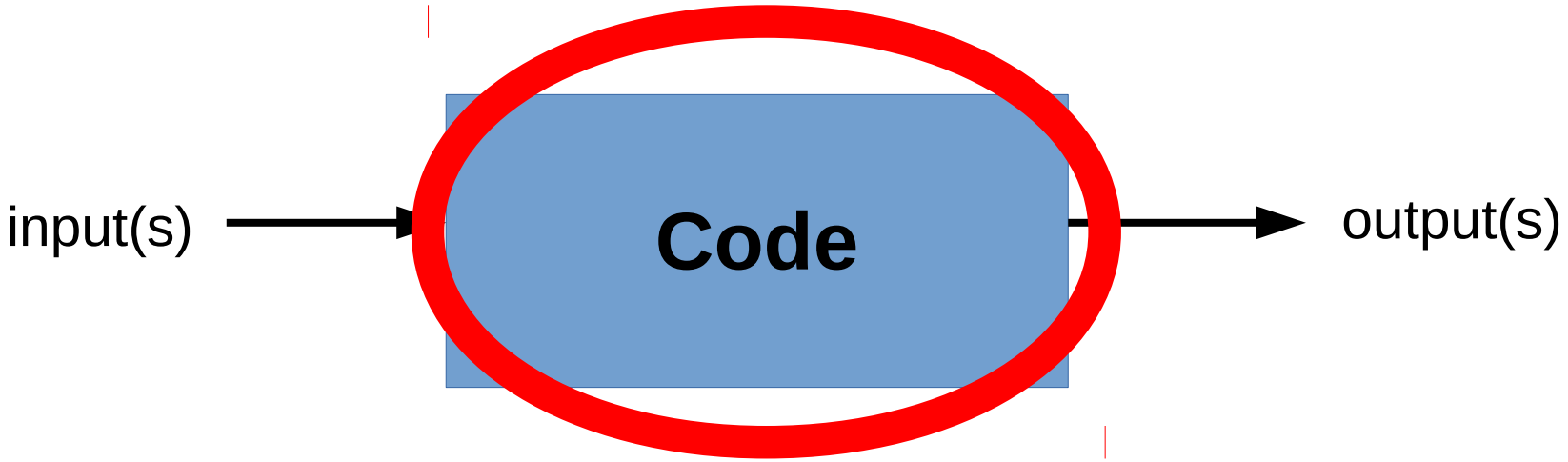
Algorithms

Computation



Algorithm

- Sequence of operations for solving a type of problem
- Similar to
  - Recipe, process, method, technique, procedure, routine
    - E.g., cooking

Features of an Algorithm [Knuth]

- **Finiteness**
  - Eventually completes
- **Definiteness**
  - Precisely defined
- **Input**
  - Objects given before algorithm begins
- **Output**
  - Objects related to the inputs
- **Effectiveness**
  - Sufficiently basic operations to solve a specific class of problems

In Class Example

Vectors

- We often want to store sequences of data
  - E.g., Read in sequence of numbers, list of solutions
- Declare a vector to store integers

```
vector<int> heights;
```

- Read and store a series of values

```
while (cin >> val)
    temps.push_back(val);
```

Vectors

- Declare and initialize a vector

```
vector<int> heights = {1,2,3};
```

- Read and output each value

```
for (int i=0; i<v.size(); ++i) {
  cout << v[i] << '\n';
}
```

or

```
for(int i: v) {
  cout << i << '\n';
}
```

- Insert a value at a given position

```
v.insert(v.begin() + position, val);
```