



F5.5 Linear search

Algorithms · GCSE · OCR J277 2.1.3, AQA 8525 3.1.3, Edexcel 1CP2 1.2.6 ·
about 15 min

Name _____

Class _____

Date _____

What this lesson is about

Checking every item: finding a marker in the robot's sightings.

- The algorithm
- Searching what the robot sees
- Counting the work
- When linear search is the right choice

Questions

5 marks in all

1. Linear search looks for 22 in [12, 5, 31, 8, 22, 3]. How many items does it check? [1 mark]

2. Linear search looks for 99 in a list of 8 items that does not contain it. How many items does it check? [1 mark]

3. Does linear search need the list to be sorted? [1 mark]

- ☐ A No, it works on any list
- ☐ B Yes, always
- ☐ C Only for numbers
- ☐ D Only for long lists

4. What is the main disadvantage of linear search? [1 mark]

- ☐ A It is slow on large lists
- ☐ B It needs sorted data
- ☐ C It cannot find the first item
- ☐ D It uses a lot of memory

5. What does this program print? [1 mark]

```
def find(items, target):  
    for i in range(len(items)):  
        if items[i] == target:  
            return i  
    return -1  
  
print(find([4, 9, 2], 2), find([4, 9, 2], 7))
```

The task: find the marker

The task asks `Which marker?` and answers `31`. Look in all eight directions and record the marker straight ahead in each, then use **linear search** on your list to find where the wanted marker is. Print `found <id> at <degrees> degrees after <n> checks`, turn to face it, and beep.

```
# the two lines every program starts with: the commands, then the robot
from bugbot import *
connect()

set_cv("apriltag")
target = int(input("Which marker? "))
```

Plan your program here, then type it in and press Run.



Do it on the robot

www.bugbotlab.com/learn/f5-5-linear-search/

The simulator checks it and tells you when it passes. Nothing to install, no account.

Challenges

1. Change the search to find **every** position of a target in a list that has repeats, and return a list of indexes.
2. Search a list of names for the first one that starts with a given letter.
3. What does the search report if two markers in the ring had the same id? Is that a problem?