

## Animal Tracking Engineering Project

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### Textbook

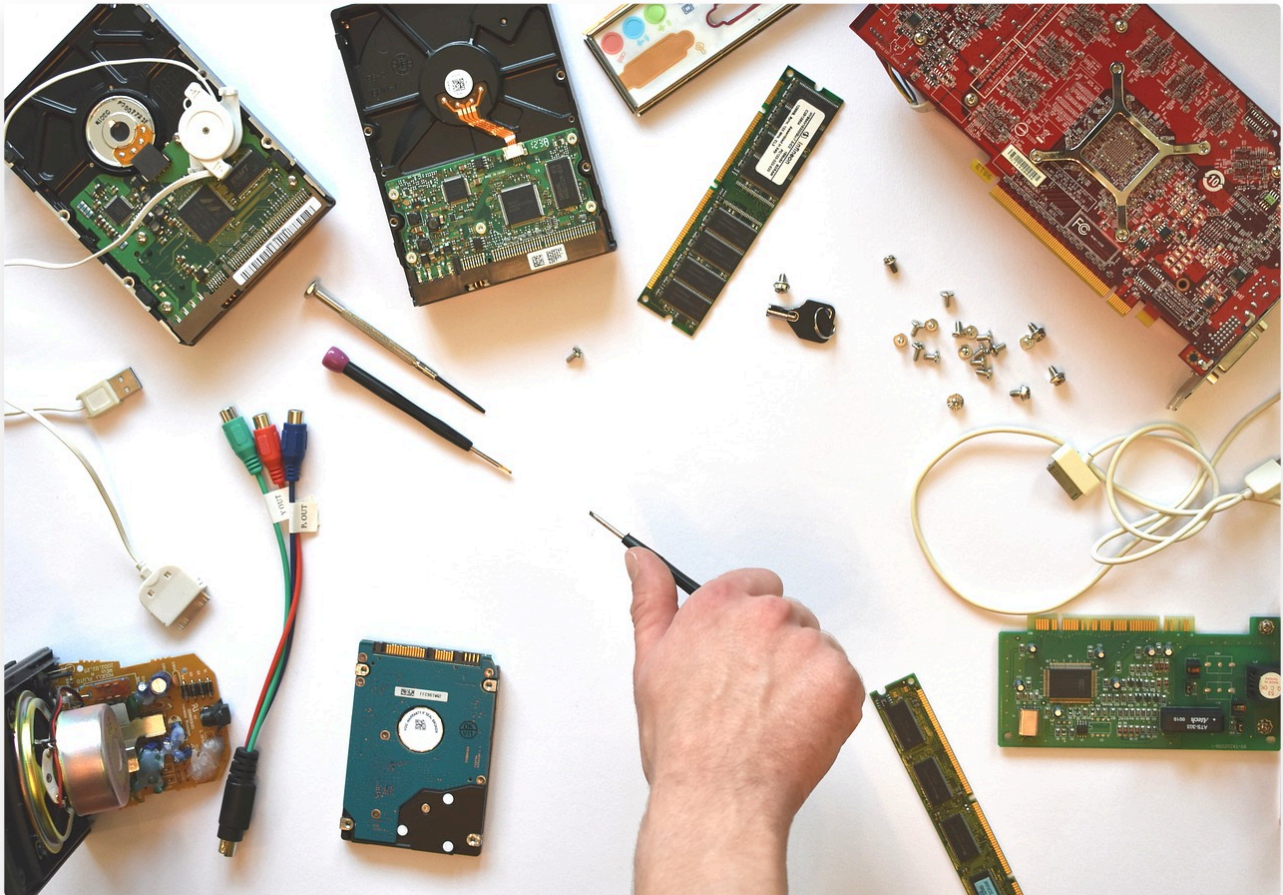
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## Animal Tracking Engineering Project



You have been tasked to engineer a computer program that will help keep track of all the data you are receiving from tracking marine animals in the Pacific Ocean.

The marine biologist team attached trackers to the animals. These trackers send in daily information about the temperature of the water and the distance the animal travelled in a day. These trackers send in much more information than this, but the team wants you to focus on temperature and distance for this engineering project.



You will build a computer program that will take inputs about temperature and distance and produce a daily report. For this project, you will be putting in the inputs, but once you hand over your program to the team, the inputs could come in daily from the tracker and it will be all automated.

The daily report will print out the following requirements:

1. The date
2. The water temperature on that date
3. The distance the animal travelled on that date
4. Total days tracked
5. Total distance travelled
6. Average distance travelled per day (updated daily)

For example, here is an output report:

```

1 Oct 1, 2020
2 Total days: 1
3 Total distance: 8
4 Average distance: 8.0
5 Average temperature: 15.0
6 Oct 2, 2020
7 Total days: 2
8 Total distance: 12
9 Average distance: 6.0
10 Average temperature: 16.5
11 Oct 3
12 Total days: 3
  
```

```
13 Total distance: 24
14 Average distance: 8.0
15 Average temperature: 14.6666666667
16 Oct 4, 2020
17 Total days: 4
18 Total distance: 26
19 Average distance: 6.5
20 Average temperature: 16.0
21 Oct 5, 2020
22 Total days: 5
23 Total distance: 41
24 Average distance: 8.2
25 Average temperature: 16.6
```

For each day it asks for the date, distance travelled that day, and water temperature that day. It updates the total number of days and the total distance with each new entry. It also updates the average distance and temperature with each new day.

Below are some suggestions for how to go about your engineering project.

## Python While Loops

The while loop is used when you want code to run *while* something is true. You can think of a while loop as an if statement that repeats over and over again until a specific condition is met.



While loops run *while* a condition is true. For example, let's say we were writing a program for when the information for the animal tracking comes in. We want the program to ask us if there is another day of info to enter or not. If there is, we want the program to run. If not, we want the program to stop. See the code box for an example.



```

1 day = input("Do you have another day to input? y or n")
2
3 while day == "y":
4     print("Here is the information for this day")
5
6     day = input("Do you have another day to input? y or n")
7

```

Copy

Try it!

We recommend you use this kind of while loop for your engineering project.

## Updating Variables

You can also update variables as the program goes on. Below is an example using the while loop.

```

1 day = input("Do you have another day to input? y or n")
2
3 total_days = 0
4
5 while day == "y":
6     print("Here is the information for this day")
7     total_days = total_days + 1
8
9     day = input("Do you have another day to input? y or n")
10

```

Try it!

The variable named `total_days` will add 1 each time the user enters another day.

## Checkpoint

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### Engineering Project

Engineer a computer program that will generate a report with the following information: The date The water temperature on that date The distance the animal travelled on that date Total days tracked Total distance travelled Average distance travelled per day (updated daily) This project is not auto graded. This gives you and your groups the freedom to create a project with your own unique flair. There are many ways to accomplish the objective of reporting on the animal. See which way works for you!

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## Answer Keys & Solutions

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### Checkpoint Solutions

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#### Engineering Project

```
1 day = input("Do you have another day to input? y or n")
2 total_days = 0
3 total_distance = 0
4 average_distance = 0
5 temp_total = 0
6 while day == "y":
7     date = input("What is the date to input?")
8     print(date)
9     temp = int(input("What is the temperature on that day?"))
10    distance = int(input("What is the distance travelled on that day?"))
11    total_days = total_days + 1
12    total_distance = total_distance + distance
13    average_distance = total_distance / total_days
14    temp_total = temp_total + temp
15    temp_average = temp_total / total_days
16    print("Total days: " + str(total_days))
17    print("Total distance: " + str(total_distance))
18    print("Average distance: " + str(average_distance))
19    print("Average temperature: " + str(temp_average))
20    day = input("Do you have another day to input? y or n")
```