

# Python Challenge

1



## Challenge 1

Write a program that:

- asks the user to input their age
- outputs 'Your age is: ' followed by their age

You will need to use:

**Sequencing**

**Variables**

# Python Challenge

2



## Challenge 2

Write a program that:

- asks the user to input two numbers
- calculates the average
- outputs the result

You will need to use:

**Sequencing**

**Variables**

**Tip:** To calculate the average of two numbers you need to add them together and divide them by two.

# Python Challenge

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## Challenge 3

Write a program that:

- asks the user to input the width and height of a rectangle
- calculates the area
- outputs the result

You will need to use:

**Sequencing**

**Variables**

**Tip:** Multiply the width by the height to find the area of a rectangle.

# Python Challenge

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## Challenge 4

Write a program that:

- asks the user to input two numbers
- divides the first number by the second number
- outputs the result

You will need to use:

**Sequencing**

**Variables**

# Python Challenge

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## Challenge 5

Write a program that:

- asks the user their name
- asks what their favourite subject is (using their name in the question)
- responds to their answer by saying that you like that subject as well

You will need to use:

**Sequencing**

**Variables**

# Python Challenge

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## Challenge 6

Write a program that:

- asks the user their name
- if it is the same as your name, outputs 'You're cool', otherwise outputs 'Nice to meet you'

You will need to use:

**Selection**

**Variables**

# Python Challenge

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## Challenge 7

Write a program that:

- asks the user how long on average they spend watching TV each day
- if it is less than 2 hours, outputs 'That shouldn't rot your brain too much'; if it is less than 4 hours per day, outputs 'Aren't you getting square eyes?'; otherwise outputs 'Fresh air beats channel flicking'

You will need to use:

**Selection**

**Variables**

# Python Challenge

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## Challenge 7: Solution

```
#!/usr/bin/python3

#Asks the user to input a value and stores it in the
time variable
time=int(input("How many hours on average do you
spend watching TV each day?: "))

#If statement that outputs different strings
depending on the value stored in
#the time variable
if time<2:
    print ("That shouldn't rot your brain too much")
elif time<4:
    print ("Aren't you getting square eyes?")
else:
    print ("Fresh air beats channel flicking")
```

### 1 point [x2]

The program asks the user how long they spend on a computer per day.

### 2 points [x2]

If the response is less than 2, it outputs 'That seems reasonable'.

### 3 points [x2]

If the response is less than 4, it outputs 'I'm surprised you have time for anything else!', otherwise it outputs 'You need to get some fresh air once in a while'.



# Python Challenge

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## Challenge 8: Solution

```
mark=int(input("Enter the  
mark: "))
```

```
if mark>=75:  
    print ("Grade: A")  
elif mark>=60:  
    print ("Grade: B")  
elif mark>=35:  
    print ("Grade: C")  
else:  
    print ("Grade: D")
```

### 1 point [x2]

The program asks the user to input the student's mark.

### 2 points [x2]

The program converts most marks to grades correctly.

### 3 points [x2]

The program converts all marks to grades correctly.

# Python Challenge

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## Challenge 9: Solution

```
#!/usr/bin/python3

#Asks the user to input one of the Olympic Values
and stores it in a variable
value=input("Name one of the Olympic Values: ")

#Outputs different strings depending on whether the
user correctly
#entered the name of an Olympic Value
if value=="respect" or value=="excellence" or
value=="friendship":
    print ("That's correct")
else:
    print ("Try again")
```

### 1 point [x2]

The program asks the user to input the name of one of the Olympic values.

### 2 points [x2]

The program outputs 'That's correct' if they enter a valid Olympic value.

### 3 points [x2]

The program outputs 'Try again' if they enter an invalid Olympic value.

# Python Challenge

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## Challenge 10

Write a game that:

- allows the user to play rock, paper, scissors against the computer
- must display the computer's choice and show the result of the game

You will need to use:

**Selection**

**Variables**

**Tip:** The computer's answer must be random.

# Python Challenge

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## Challenge 11

Write a program that:

- asks the user to input a sentence
- calculates and outputs how many characters there are in the sentence

You will need to use:

**Variables**

**String Manipulation**

# Python Challenge

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## Challenge 12

Write a program that:

- asks the user to input a sentence
- outputs the sentence in upper case

You will need to use:

**Variables**

**String Manipulation**

# Python Challenge

13



## Challenge 13

Write a program that:

- asks the user to input a sentence
- asks the user to input:
  - the word they want to replace
  - the word they want to replace it with
- outputs the new sentence

You will need to use:

**Variables**

**String Manipulation**

# Python Challenge

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## Challenge 14

Write a program that:

- asks the user to input a sentence
- outputs the number of times the word 'the' occurs in it

You will need to use:

**Variables**

**String Manipulation**

# Python Challenge

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## Challenge 15

Write a program that:

- asks the user to input a sentence
- outputs the sentence in lower case

You will need to use:

**Variables**

**String Manipulation**



# Python Challenge

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## Challenge 16

Write a program that:

- outputs all numbers between 1 and 10

You will need to use:

**Variables**

**Repetition**

**Tip:** You must use a For Loop for this challenge.

# Python Challenge

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## Challenge 17

Write a program that:

- outputs all odd numbers between 1 and 99

You will need to use:

**Variables**

**Repetition**

**Tip:** You must use a For Loop for this challenge.

# Python Challenge

18



## Challenge 18

Write a program that:

- asks the user to input a number
- outputs the times table for that number

You will need to use:

**Variables**

**Repetition**

**Tip:** You must use a For Loop for this challenge.

# Python Challenge

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## Challenge 19

Write a program that:

- asks the user to input a number
- outputs the times table for that number
- starts again every time it finishes

You will need to use:

**Variables**

**Repetition**

**Tip:** You must use a For Loop and a While Loop for this challenge.

# Python Challenge

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## Challenge 20

Write a program that:

- asks the user to input a number and repeats until they guess the number 7
- congratulate the user with a 'Well Done' message when they guess correctly

You will need to use:

**Variables**

**Repetition**

# Python Challenge

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## Challenge 21

Write a program that converts between centimetres, and inches and vice versa, by:

- asking the user to input a number
- asking the user to choose between converting from centimetres to inches or from inches to centimetres
- calculating and outputting the result using functions

**Tip:** 1 inch = 2.54 cm  
1 cm = 0.393700787 inches

You will need to use:

**Variables**

**Selection**

**Functions**

# Python Challenge

22



## Challenge 22

Write a program that:

- asks the user for the distance (in metres)
- asks the user for the time in seconds that a journey was completed in
- calculates and outputs the average speed using a function

You will need to use:

**Variables**

**Selection**

**Functions**

**Tip:**  $\text{Speed} = \text{Distance} / \text{Time}$

# Python Challenge

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## Challenge 23

*A gardener needs to buy some turf for a project they are working on. The garden is rectangular with a circular flower bed in the middle.*

Write a program that:

- asks the user for the dimensions of the lawn and the radius of the circle (in metres)
- uses a function to calculate and output the amount of turf needed

**Tip:** Circle area =  $\text{Pi} \times \text{Radius}^2$

You will need to use:

**Variables**

**Selection**

**Functions**



# Python Challenge

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## Challenge 24

Write a function that takes two numbers.

The first number indicates the number of spaces that should be displayed and the second indicates the number of Xs that should be displayed. These should both be displayed on the same line.

Now write another function that makes multiple calls to your first function and draws a picture with Xs.

You will need to use:

**Variables**

**Selection**

**Repetition**

**Functions**

# Python Challenge

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## Challenge 25

Write a sign-up program for an after-school club; it should ask the user for the following details and store them in a file:

- First Name
- Last Name
- Gender
- Form

You will need to use:

**Variables**

**Selection**

**File Handling**

# Python Challenge

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## Challenge 26

Write a maths quiz with three questions.

It must ask the user to input their name at the start.

At the end it should display a message informing the user of their score.

Write a function that saves the user's name and quiz result in a text file.

You will need to use:

**Variables**

**Selection**

**Functions**

**File Handling**

# Python Challenge

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## Challenge 26: Solution

...

**#Question 2**

```
answer=int(input("What is 10 + 13?: "))  
if answer==23:  
    score=score+1
```

**#Question 3**

```
answer=int(input("What is 10 / 2?: "))  
if answer==5:  
    score=score+1
```

**#Prints the score to the screen**

```
print("Your score is: ",score)
```

**#Calls the saveScore function and passes the name  
and score variables**

```
saveScore(name, score)
```

**1 point [x4]**

The program asks the user to input their name and then asks three maths questions.

**2 points [x4]**

At the end of the questions the program displays the user's name followed by their score.

**3 points [x4]**

A function has been used to save the user's name and quiz result to a text file.

# Python Challenge

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## Challenge 27: Solution

```
#!/usr/bin/python3

def saveScore(n,s):
    #Opens the file or creates it if it doesn't already exist
    file = open("scores.txt", "a")
    #Records the user's score in the file
    file.write("Name: "+n+", Score: "+str(s)+"\n")
    #Closes the file
    file.close()
    return

print("----MATHS QUIZ----\n")

print("----SCORES----")
#Creates the scores.txt file if it doesn't exist
file = open("scores.txt", "a")
file.close()
#Opens the file in read-only mode
file = open("scores.txt", "r")
#Loop that prints each line from the file
for line in file:
    print(line)

...
```

**1 point [x5]**

The program opens an external file.

**2 points [x5]**

The program loads the scores from an external file.

**3 points [x5]**

The program displays the scores from an external file.

# Python Challenge

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## Challenge 28

Write a random name generator that asks for the user to input 5 names, stores them in an array and then outputs one of them at random.

You will need to use:

**Variables**

**Repetition**

**Arrays**

# Python Challenge

29



## Challenge 29

Write a program that allows the user to create and store a checklist for a holiday.

It should start by asking them the destination of the holiday, how many things they need to pack and how many tasks they need to complete to prepare.

The user should then be able to enter each item they need to pack and each task they need to complete.

You will need to use:

**Variables**

**Repetition**

**Arrays**

**File Handling**

# Python Challenge

29



## Challenge 29: Solution

...

**#Loop to store the tasks**

```
for i in range(0, tasksNum):  
    tasks.append(input("Enter task "+str(i+1)+" : "))
```

**#Stores the checklist in a file**

```
file = open((name+" checklist.txt"), "w")  
file.write("Destination: "+name+"\nPacking List: \n")  
for item in packList:  
    file.write(item+"\n")  
file.write("Tasks: \n")  
for item in tasks:  
    file.write(item+"\n")  
file.close()  
print("Your list has been saved")
```

### 1 point [x5]

The program asks the user for the destination of their holiday, how many things they need to pack and how many tasks they need to complete.

### 2 points [x5]

The program should use a For loop to ask the user to input each item they need to pack and each task they need to complete.

### 3 points [x5]

The program should store the inputted data in an external file in a clear and easy-to-read format.



# Python Challenge

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## Challenge 30: Solution

```
#!/usr/bin/python3

#Function that can be used to ask each question
def ask(q,s):
    answer=int(input(questions[0][q]))
    if answer==questions[1][q]:
        s=s+1
    return s

print("----MATHS QUIZ----\n")

print("----SCORES----")
#Creates the scores.txt file if it doesn't exist
file = open("scores.txt", "a")
file.close()
#Opens the file in read-only mode
file = open("scores.txt", "r")
#Loop that prints each line from the file to the
screen
for line in file:
    print(line)
file.close()

...
```

### 1 point [x5]

An attempt has been made to make a two-dimensional array.

### 2 points [x5]

The program uses a two-dimensional array to store the questions and answers for a quiz.

### 3 points [x5]

A For loop is used to ask the questions stored in the two-dimensional array. At the end of the quiz the user's score must be saved to an external file.