# Python Challenges

## For KS3/4

# 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**

Difficulty:

# Python Challenge 1

## Challenge 1: 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 [x1]**
The program asks the user to input their age.

**2 points [x1]**
The age is outputted.

**3 points [x1]**
The output includes the text 'Your age is: ' plus the age.

# 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.

Difficulty:

# Python Challenge 2

## Challenge 2: Solution

```
#!/usr/bin/python3

print ("----AVERAGE CALCULATOR----")

#Asks the user to input two numbers and stores them
in the num1 and num2 variables
num1=int(input("Enter your first number: "))
num2=int(input("Enter your second number: "))

#Calculates the average of the two numbers
average=(num1+num2)/2

#Outputs the value stored in the average variable to
the screen
print ("The average is:",str(average))
```

**1 point [x1]**
The program asks the user to input two numbers.

**2 points [x1]**
The average is calculated and outputted; however, it may not be correct.

**3 points [x1]**
The average is calculated correctly and outputted.

# Python Challenge 3

## 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.

Difficulty:

# Python Challenge 3

## Challenge 3: Solution

```
#!/usr/bin/python3

print ("----AREA CALCULATOR----")

#Asks the user to input the width and height and
stores them in variables
width=int(input("Enter the width: "))
height=int(input("Enter the height: "))

#Calculates the area and stores it in the area
variable
area=width*height

#Outputs the value stored in the area variable to
the screen
print ("The area is:",str(area))
```

**1 point [x1]**
The program asks the user to input the width and height of a rectangle.

**2 points [x1]**
The area is calculated and outputted; however, it may not be correct.

**3 points [x1]**
The area is calculated correctly and outputted.

# Python Challenge 4

## 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**

Difficulty:

# Python Challenge 4

## Challenge 4: Solution

```
#!/usr/bin/python3

print ("----DIVIDER----")

#Asks the user to input two numbers and stores them
in two variables
num1=int(input("Enter your first number: "))
num2=int(input("Enter your second number: "))

#Divides the value in the num1 variable by the value
in the num2 variable
result=num1/num2

#Outputs the value stored in the result variable to
the screen
print ("The result is:",str(result))
```

**1 point [x1]**
The program asks the user to input two numbers.

**2 points [x1]**
The program divides the first number by the second number.

**3 points [x1]**
The result is outputted.

# Python Challenge 5

## 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**

Difficulty:

# Python Challenge 5

## Challenge 5: Solution

```
#!/usr/bin/python3

#Asks the user to input their name and stores it in
a variable
name=input("Enter your name: ")

#Asks the user to input their favourite subject,
using the value stored in the name variable in the
question
subject=input("What is you favourite subject
"+name+"? ")

#Outputs the value stored in the food variable
print ("I like",subject,"as well!")
```

**1 point [x1]**
The program asks the user for their name and their fav ourite food.

**2 points [x1]**
The program asks the user for their fav ourite food using their name in the question.

**3 points [x1]**
The program outputs a sentence that includes their fav ourite food.

# Python Challenge 6

## Challenge 6

Write a program that:

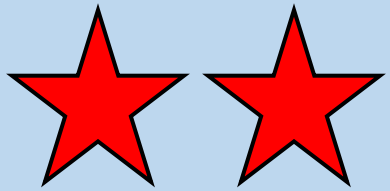
- asks the user their name
- if it is the same as your name, outputs 'You're cool', otherwise outputs 'Nice to meet you'

You will need to use:

**Selection**

**Variables**

Difficulty: 2



# Python Challenge 6

## Challenge 6: Solution

```
#!/usr/bin/python3

#Asks the user to input their name and stores it in
a variable
name=input("Enter your name: ")

#Asks the question: is the value in name equal to
"Bob"?
if name=="Bob":
    #If the answer to the question is yes this line
     is outputted
    print ("You're cool")
else:
    #Otherwise this line is outputted
    print ("Nice to meet you")
```

**1 point [x2]**
The program asks the user to input their name.

**2 points [x2]**
If the inputted name is the same as the programmer's name, the program outputs 'You're cool'.

**3 points [x2]**
If the inputted name is not the same as the programmer's name, the program outputs 'Nice to meet you'.

# Python Challenge 7

## Challenge 7

Write a program that:

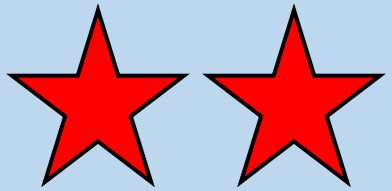
- asks the user how long on average they spend watching TV each day
- if it is less than 2 hours, outputs 'That shouldn't rot your brain too much'; if it is less than 4 hours per day, outputs 'Aren't you getting square eyes?'; otherwise outputs 'Fresh air beats channel flicking'

You will need to use:

**Selection**

**Variables**

Difficulty: 2



# Python Challenge 7

## 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 8

## Challenge 8

Write a program that:

- converts and outputs marks into grades, using the following data:

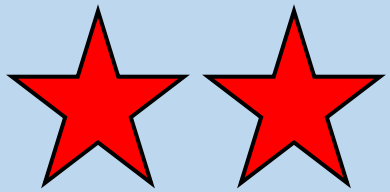
| | |
|---|---|
| *Greater than or equal to 75* | *A* |
| *Greater than or equal to 60* | *B* |
| *Greater than or equal to 35* | *C* |
| *Less than 35* | *D* |

You will need to use:

**Selection**

**Variables**

Difficulty: 2



# Python Challenge 8

## Challenge 8: Solution

```
#!/usr/bin/python3

print ("----GRADE CALCULATOR----")

#Asks the user to input the mark and stores it in
the mark variable
mark=int(input("Enter the mark: "))

#If statement that outputs different strings
depending on the value stored
#in the mark variable
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 9

## Challenge 9

Write a program that:

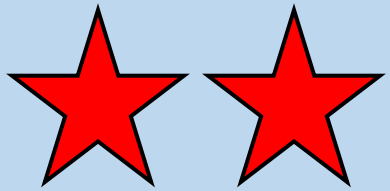
- asks the user to name one of the Olympic Values (Respect, Excellence and Friendship)
- if they correctly name one, output 'That's correct', otherwise output 'Try again'

You will need to use:

**Selection**

**Variables**

Difficulty: 2



# Python Challenge 9

## 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 10

## 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

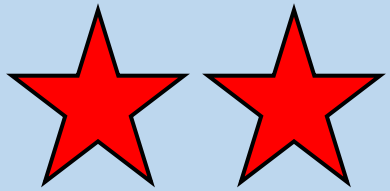
You will need to use:

**Selection**

**Variables**

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

Difficulty: 2



# Python Challenge 10

## Challenge 10: Solution

```
#!/usr/bin/python3

print ("----ROCK, PAPER, SCISSORS----")
import random

#generates a random number between 1 and 3
computer=random.randint(1,3)

#asks the user to input their choice and stores it in a variable
user=int(input("Enter your
choice:\n1=Rock\n2=Paper\n3=Scissors\n"))

#outputs the computer's move
print("The computer has chosen",computer)

#outputs a different string depending on the game outcome
if computer==user:
    print ("Tie game")
elif computer==1 and user==3:
    print ("Computer wins")
elif computer==2 and user==1:
    print ("Computer wins")
elif computer==3 and user==2:
    print ("Computer wins")
else:
    print ("You Win!")
```

**1 point [x2]**
The program asks the user to select rock, paper or scissors.

**2 points [x2]**
The outcome of the game is correctly calculated.

**3 points [x2]**
The computer's answer is random.

# Python Challenge 11

## 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**

Difficulty: 3

# Python Challenge 11

## Challenge 11: Solution

```
#!/usr/bin/python3

#asks the user to input a sentence and stores it in
the text variable
text=input("Enter your sentence: ")

#outputs the number of characters to the screen
print ("There are",len(text),"characters")
```

**1 point [x3]**
The program asks the user to input a sentence.

**2 points [x3]**
The program outputs the number of characters in the sentence.

**3 points [x3]**
The program outputs an appropriate string along with the number of characters in the sentence.

# Python Challenge 12

## 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**

Difficulty: 3

# Python Challenge 12

## Challenge 12: Solution

```
#!/usr/bin/python3

#asks the user to input a sentence and stores it in
the text variable
text=input("Enter your sentence: ")

#outputs the sentence in upper case
print (text.upper())
```

**1 point [x3]**
The program asks the user to input a sentence.

**2 points [x3]**
The program outputs the original sentence.

**3 points [x3]**
The program outputs the sentence in upper case.

# 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**

Difficulty: 3

# Python Challenge 13

## Challenge 13: Solution

```
#!/usr/bin/python3

#asks the user to input a sentence and stores it in the
text variable
text=input("Enter your sentence: ")
word1=input("Enter the word you want to replace: ")
word2=input("Enter the word you want to replace it with: ")

#outputs the sentence with the original word replaced
with the new word
print (text.replace(word1,word2))
```

**1 point [x3]**
The program asks the user to input a sentence and the word they want to replace.

**2 points [x3]**
The program outputs the original sentence.

**3 points [x3]**
The program outputs the sentence with the word replaced.

# Python Challenge 14

## 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**

Difficulty: 3

# Python Challenge 14

## Challenge 14: Solution

```
#!/usr/bin/python3

#asks the user to input a sentence and stores it in the
text variable
text=input("Enter your sentence: ")

#outputs the number of times "the" occurs in the sentence
print ("'The' appears",text.count("the"),"times")
```

**1 point [x3]**
The program asks the user to input a sentence.

**2 points [x3]**
The program counts the number of times 'the' occurs in it.

**3 points [x3]**
The program outputs the number of times 'the' occurs in it.

# Python Challenge 15

## 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**

Difficulty: 3

# Python Challenge 15

## Challenge 15: Solution

```
#!/usr/bin/python3

#asks the user to input a sentence and stores it in the
text variable
text=input("Enter your sentence: ")

#outputs the sentence in lower case
print (text.lower())
```

**1 point [x3]**
The program asks the user to input a sentence.

**2 points [x3]**
The program outputs the original sentence.

**3 points [x3]**
The program outputs the sentence in lower case.

# Python Challenge 16

## 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.

Difficulty: 3

# Python Challenge 16

## Challenge 16: Solution

```
#!/usr/bin/python3

#a loop that outputs numbers from 1 to 10
for x in range(1,11):
    print(x)
```

**1 point [x3]**
The program outputs some numbers to the screen.

**2 points [x3]**
The program outputs the numbers 1 to 10.

**3 points [x3]**
The program uses a For loop to output the numbers 1 to 10.

# Python Challenge 17

## 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.

Difficulty: 3

# Python Challenge 17

## Challenge 17: Solution

```
#!/usr/bin/python3

num=1

#a loop that outputs the odd numbers from 1 to 100
for x in range(0,50):
    print(num)
    num=num+2
```

**1 point [x3]**
The program outputs some numbers to the screen.

**2 points [x3]**
The program outputs some odd numbers.

**3 points [x3]**
The program outputs all the odd numbers from 1 to 99.

# 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.

Difficulty: 3

# Python Challenge 18

## Challenge 18: Solution

```
#!/usr/bin/python3

print ("----TIMES TABLE GENERATOR----")

#asks the user to input a number
num=int(input("Enter a number: "))

#this loop generates the times table for the number
stored in the num variable
for x in range(0,10):
    print (str((x+1)*num))
```

**1 point [x3]**
The program asks the user to input a number.

**2 points [x3]**
The program outputs the time table for the inputted number.

**3 points [x3]**
The program includes a For loop to generate the times table.

# Python Challenge 19

## 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.

Difficulty: 3

# Python Challenge 19

## Challenge 19: Solution

```
#!/usr/bin/python3

print ("----TIMES TABLE GENERATOR----")

#a loop that will continually repeat the program
while True:
    #asks the user to input a number and stores it
    in the num variable
    num=int(input("\nEnter a number: "))

    #a loop that outputs the times table for the
    number stored in the num variable
    for x in range(0,10):
        print (str((x+1)*num))
```

**1 point [x3]**
The program asks the user to input a number.

**2 points [x3]**
The program outputs the times table for the number given.

**3 points [x3]**
A While loop has been used to make the program repeat forever.

# Python Challenge 20

## 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**

Difficulty: 3

# Python Challenge 20

## Challenge 20: Solution

```
#!/usr/bin/python3

print ("----GUESS THE NUMBER----")

guess=0

#Loops until the user guesses the number 7
while guess!=7:
    guess=int(input("Enter your guess: "))
    if guess!=7:
        print("Incorrect... guess again")

print ("Well done!")
```

**1 point [x3]**
The program asks the user to guess the number.

**2 points [x3]**
If they input the number 7, the program will output 'Well Done'.

**3 points [x3]**
The program loops until the user inputs the number 7.

# Python Challenge 21

## 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

You will need to use:

**Variables**

**Selection**

**Functions**

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

Difficulty: 3

# Python Challenge 21

## Challenge 21: Solution

```
#!/usr/bin/python3

print ("----INCHES/CM CONVERTER----")

#Converts inches to cm
def intocm(n):
    convert=n*2.54
    print(n,"inches =",convert,"cm")
    return

#Converts cm to inches
def cmtoin(n):
    convert=n*0.393700787
    print(n,"cm =",convert,"inches")
    return

#Asks the user to input a number and select the type of
conversion they want to perform
num=int(input("Enter the number you want to convert: "))
unit=int(input("Choose an option:\n1=INCHES to
CENTIMETRES\n2=CENTIMETRES to INCHES\n"))

#If statement calls the appropriate function
if unit==1:
    intocm(num)
elif unit==2:
    cmtoin(num)
```

**1 point [x3]**
The program asks the user to choose the type of the conversion they want to carry out and to input the number they want to convert.

**2 points [x3]**
The program correctly converts between inches and centimetres.

**3 points [x3]**
The program uses separate functions to convert between inches and centimetres.

# 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:** Speed = Distance / Time

Difficulty: 3

# Python Challenge 22

## Challenge 22: Solution

```
#!/usr/bin/python3

print ("----AVERAGE SPEED CALCULATOR----")

#Function to calculate average speed
def calculate(d,t):
    speed=d/t
    print("The average speed is:",speed,"m/s")
    return

#User input of distance and time
distance=int(input("Enter the distance travelled in
metres: "))
time=int(input("Enter the time it took to complete
the journey in seconds: "))

#Calls the calculate function, passing the distance
and time variables
calculate(distance,time)
```

**1 point [x3]**
The program asks the user to input the distance and time.

**2 points [x3]**
The program correctly calculates the average speed.

**3 points [x3]**
The program uses a function to calculate the average speed.

# Python Challenge 23

## 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

You will need to use:

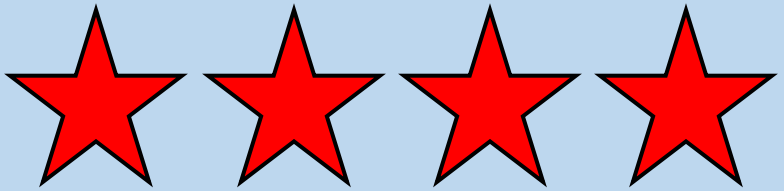
**Variables**

**Selection**

**Functions**

**Tip:** Circle area = Pi x Radius$^2$

Difficulty: 4



# Python Challenge 23

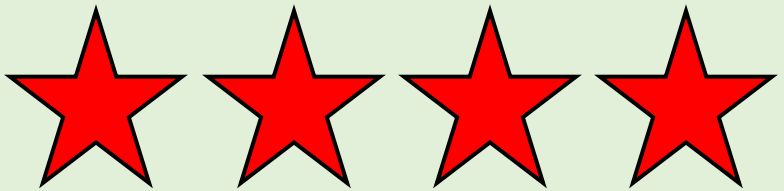
## Challenge 23: Solution

```
#!/usr/bin/python3
import math

print ("----TURF CALCULATOR----")

#Function to calculate the amount of turf required
def calculate(w,l,r):
    lawnArea=w*l
    bedArea=math.pi*r*r
    turf=lawnArea-bedArea
    print("You need",turf,"square metres of turf")
    return

#User input of width and length of the lawn and the
radius of the bed
width=int(input("Enter the width of the lawn: "))
length=int(input("Enter the length of the lawn: "))
radius=int(input("Enter the radius of the flower bed: "))

#Calls the calculate function, passing the width,
length and radius variables
calculate(width,length,radius)
```

**1 point [x4]**
The program asks the user to input the dimensions of the lawn and the radius of the circle.

**2 points [x4]**
The program correctly calculates the amount of turf required.

**3 points [x4]**
The program uses a function to calculate the amount of turf required.



# Python Challenge 24

## Challenge 24

Write a function that takes two numbers.

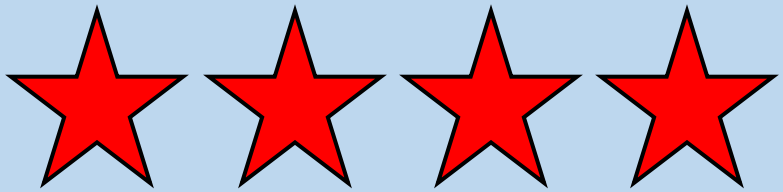
The first number indicates the number of spaces that should be displayed and the second indicates the number of Xs that should be displayed. These should both be displayed on the same line.

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**

Difficulty: 4



# Python Challenge 24

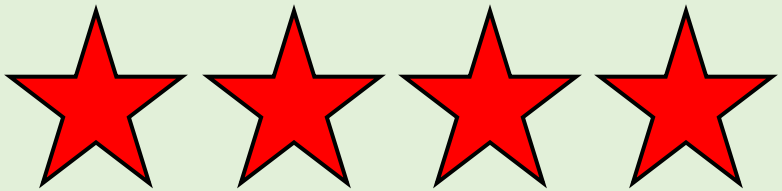
## Challenge 24: Solution

```
#!/usr/bin/python3

#Function to draw a line of the image
def drawLine(s,x):
    for i in range(0,s):
        print(" ", end=""),
    for i in range(0,x):
        print("X", end=""),
    print()
    return

#Function to call the drawLine function to draw image
def drawPicture():
    drawLine(5,1)
    drawLine(4,3)
    drawLine(3,5)
    drawLine(2,7)
    drawLine(1,9)
    drawLine(4,3)
    drawLine(4,3)
    return

drawPicture()
```

**1 point [x4]**
The program displays a number of spaces followed by a number of Xs on the same line.

**2 points [x4]**
The program uses a function to output a set number of spaces and Xs on the same line.

**3 points [x4]**
The program uses another function to draw a picture using the first function.



# Python Challenge 25

## 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

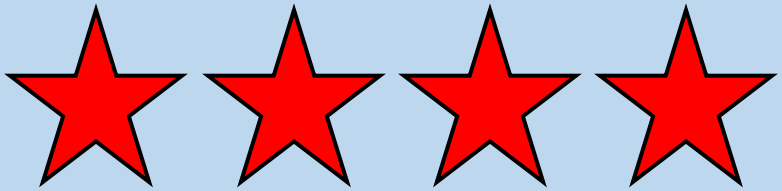
You will need to use:

**Variables**

**Selection**

**File Handling**

Difficulty: 4



# Python Challenge 25

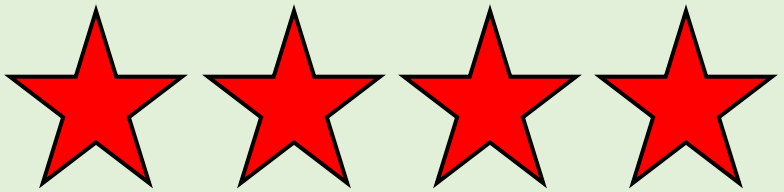
## Challenge 25: Solution

```
#!/usr/bin/python3

print("----CLUB SIGN UP----")

#User enters their details
first=input("Enter your first name: ")
last=input("Enter your last name: ")
gender=input("Enter your gender: ")
form=input("Enter your form: ")

#Opens the file or creates it if it doesn't already
exist
file = open("signup.txt", "a")
#Records the user's details in the file
file.write("\nFirst name: "+first+", Last name:
"+last+", Gender: "+gender+", Form: "+form)
#Closes the file
file.close()
```

**1 point [x4]**
The program asks the user to input their First Name, Last Name, Gender and Form.

**2 points [x4]**
The data is stored in an external text file.

**3 points [x4]**
The data is stored with appropriate labels in an external text file.



# Python Challenge 26

## Challenge 26

Write a maths quiz with three questions.

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

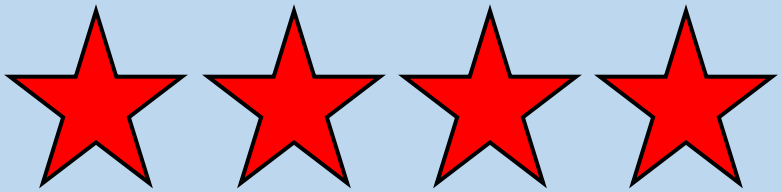
At the end it should display a message informing the user of their score.

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**

Difficulty: 4



# Python Challenge 26

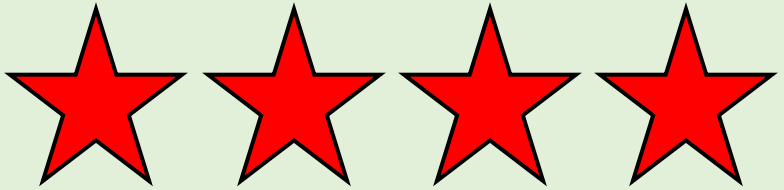
## Challenge 26: Solution

```
#!/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----")

#Variable setup
name=input("Enter your name: ")
score=0

#Question 1
answer=int(input("What is 3 x 5?: "))
if answer==15:
    score=score+1

...
```

**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 26

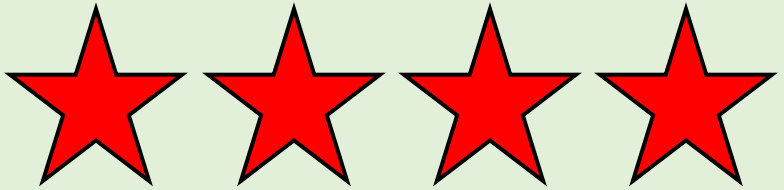
## Challenge 26: Solution

```
...

#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 27

## Challenge 27

Extend your maths quiz program from Challenge 20 by including a list of the scores of people that have taken the quiz before.

You will need to use:

- **Variables**
- **Selection**
- **File Handling**

Difficulty: 5

# Python Challenge 27

## 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 27

## Challenge 27: Solution

```
...
#Variable setup
name=input("Enter your name: ")
score=0

#Question 1
answer=int(input("What is 3 x 5?: "))
if answer==15:
    score=score+1

#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

#Calls the saveScore function and passes the variables
saveScore(name,score)
```

**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 28

## 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**

Difficulty: 5

# Python Challenge 28

## Challenge 28: Solution

```
#!/usr/bin/python3
import random
print("----RANDOM NAME GENERATOR----")

#Creates an empty array
names=[]

#Asks the user to enter 5 names and adds them to
the array
for i in range(1,6):
    names.append(input("Enter name "+str(i)+": "))

#Generates a random number between 1 and 5
num=random.randint(0,5)

#Outputs the randomly chosen name
print(names[num],"has been chosen")
```

**1 point [x5]**
The program asks the user to input 5 names.

**2 points [x5]**
The program stores the names in an array.

**3 points [x5]**
The program outputs a random name from the array.

# 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**

Difficulty: 5

# Python Challenge 29

## Challenge 29: Solution

```
#!/usr/bin/python3

print("----HOLIDAY CHECKLIST----")

#Creates the empty arrays
packList=[]
tasks=[]

#Asks the user to input the holiday info
name=input("Enter the destination of the holiday: ")
itemsNum=int(input("Enter the number of items you
need to pack: "))
tasksNum=int(input("How many tasks do you need to
complete to prepare for the holiday?: "))

#Loop to store the packing list
for i in range(0,itemsNum):
    packList.append(input("Enter the name of item
"+str(i+1)+": "))

...
```

**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 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 30

## Challenge 30

Improve your maths quiz from Challenge 20 and 27 by storing all the questions and possible answers in a two-dimensional array.

Write a function that can be reused to ask each of the questions.

You will need to use:

- **Global Variables**
- **Repetition**
- **Functions**
- **2D Arrays**

Difficulty: 5

# Python Challenge 30

## 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.

# Python Challenge 30

## Challenge 30: Solution

```
...

#Variable setup
name=input("Enter your name: ")
score=0
questions=[["What is 3 x 5?: ", "What is 10 + 13?:
", "What is 10 / 2?: "],[15,23,5]]

#Loop to call ask function to ask each question
for i in range(len(questions)+1):
    score=ask(i,score)

#Opens the file in append mode
file = open("scores.txt", "a")
#Prints the score to the screen
print("Your score is:",score)
#Records the user's score in the file
file.write("Name: "+name+", Score:
"+str(score)+"\n")
#Closes the file
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.