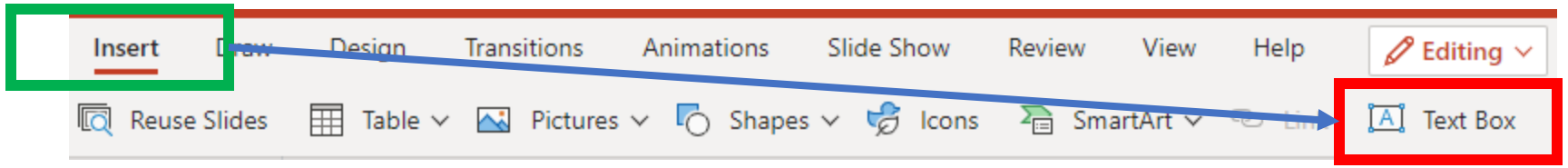
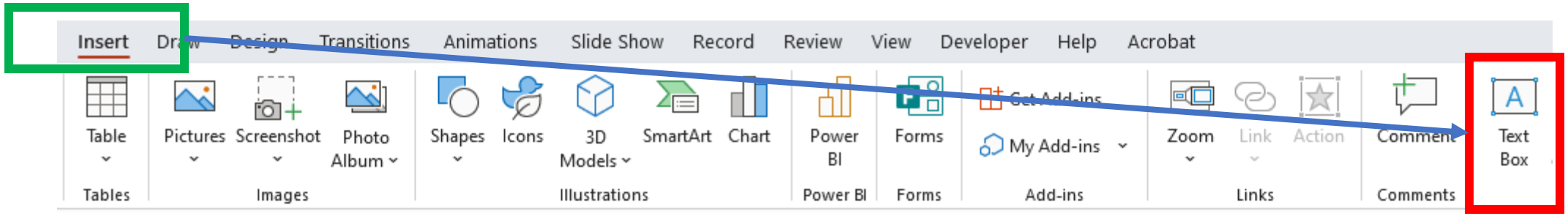
Online view:



Y9 Python Revision

In order to write your answer for the questions you'll need to insert a textbox from the "insert" tab

Desktop view:



Links to Videos

- https://www.youtube.com/watch?v=dpBe_TXFqZ8&list=PLCiOXwirraUAujkBVyzSh-LjjTCDwMU8v&index=1
- https://www.youtube.com/watch?v=ju0hFrXn8AM&list=PLCiOXwirraUAujkBVyzSh-LjjTCDwMU8v&index=2
- https://www.youtube.com/watch?v=qozjsKdyBzM&list=PLCiOXwirraUAujkBVyzSh-LjjTCDwMU8v&index=3&t=1s
- https://www.youtube.com/watch?v=oQAQNKomako&list=PLCiOXwirraUAujkBVyzSh-LjjTCDwMU8v&index=5

Q1 Give two examples of `print()` that will lead to errors.

1 .....

2 .....

Q2 Describe what variables are and what they're used for.

.....

.....

.....

Q3 For each of these scenarios, give a suitable example of a variable (or variables) and explain what they could be used for in the program.

Think about what information might need to be held and changed throughout the program

a) A computer is linked to a sensor that is used to measure the height of a sunflower over the summer.

.....

.....

b) A video game that keeps track of the individual scores two players get in three separate levels, as well as their overall score.

.....

.....

.....

Q4 For each program below, track the changes and circle what will be printed to the user's screen.

a)

```
netball = 5
tennis = 6
cricket = netball
netball = 6
tennis = 0
print(cricket)
```

0 5 6 Error

b)

```
football = "Twelve"
rugby = 5 + 2 + 2
12 = hockey
rugby = hockey + 1
squash = rugby - 1
print(squash)
```

9 12 13 Error

c)

```
swimming = 2
swimming = swimming + 4
dance = 2
dance = dance + 1
swimming = dance + swimming
print(swimming)
```

2 6 9 Error

Q5 Write a brief description of what is happening in each line of code and give the final output.

```
profit = 0
revenue = 10000
totalCosts = 4000
profit = revenue - totalCosts
print("The profit is",profit)
```

Make sure to use the key words **initialisation** and **assignment**.

.....

.....

.....

.....

.....

.....

Output: .....

Q1 What is the purpose of the `input` function?

.....

.....

Q2 Why are variables used with the `input` function?

.....

.....

Q3 Give the outputs from these two programs, given the sequence of the inputs.

a) **Greg** is entered first, followed by **Carp**.

```
petName = input("What's your pet's name? ")
animal = input("What animal is " + petName + "? ")
print("You called your",animal,petName+"?!")
```

b) **5** is entered first, followed by **7**, and then **2**.

```
a = input()
b = input("2nd input: ")
c = 12
d = input("Enter a separator: ")
print(a,b,c,sep=d)
```

Q4 Write one `print()` line to produce the output shown.

```
"One", \Two
       "Three"
```

Q5 There are five errors in the program below. Circle these errors and rewrite the program without errors in the box below. Your new program should produce the intended output shown.

```
print("I am a sentient chatbot.")
lstName = Input(What's your name, BTW? ")
print("I'm sensing your name is.../n"+lstName)
```

Intended output:

```
I am a sentient chatbot.
What's your name, BTW? Sumaya
I'm sensing your name is...
Sumaya
```

Q6 Lea was taught to use the `input` function with nothing in the brackets. Give one advantage and one disadvantage of her using `input()` in this way.

```
print("Enter your age:")
age = input()
```

.....

.....

.....

.....

Challenge 1

An accountancy firm did a bit of snooping and found that lots of their employees have got into the habit of using weak passwords, such as "password123" or "ineedcoffee".

Make a program that asks an employee for their middle name, the name of their favourite type of pasta, any number of their choosing and a symbol character (e.g. & or £). Combine these into one password which can be shown to each employee as a suggestion for a stronger password option.

Challenge 2

It's 2.45 pm on a Friday afternoon and a History teacher senses that another test on the bubonic plague might go down badly. Code a version of the classroom memory game "I went to the market today" which can be played by the class instead. In the real-life version, the pupils take turns naming different items they might buy in alphabetical order as they move around the room. However, before saying their item, they must also say all of the items which were said before.

Your program should recreate this by doing the following:

- Start off by printing "I went to the market today and bought..."
- Then ask the first pupil to enter an item starting with the letter 'a'.
- Ask a second pupil to enter an item starting with the letter 'b' and continue this for the next few letters of the alphabet (for your sanity, you can stop when you've done the letter 'e').
- Between asking pupils, print "I went to the market today and bought" followed by all of the previous items entered.

Example output:

```
I went to the market and bought...
Enter an item starting with 'a': Apple
I went to the market today and bought an Apple.
Enter an item starting with 'b': Banana
I went to the market today and bought an Apple and a Banana.
```

To format the output appropriately, you can use the general rule that 'a' precedes a consonant, and 'an' precedes a vowel. This is fine here, but it doesn't always work — e.g. if your user buys an 'hourglass' this would display as 'a hourglass'.

To complete the below tasks, you will need to use the online emulator of Python:

https://www.online-python.com/

Once loaded highlight all the lines that are already there and press the delete button

Q1 Tick the correct data type for the values in the table.

Value	String	Boolean	Float
16.5			
Big Wednesday			
false			

Q2 Give a description of each of the following data types.

a) integer

.....

b) string

.....

c) float

.....

Q3 The program shown uses casting.

```
a = 16.90
a = int(a)
print(a)
```

a) Give the output for the program. Output .....

b) Describe the purpose of casting in Python.

.....

.....

Q4 Consider each of the scenarios below. Which data types should be assigned to the data used within each scenario?

a) Storing a user's age in an online form

.....

b) The balance of a bank account in a banking app

.....

c) Asking a user to describe the quality of their experience when using an online service

.....

d) A True or False quiz program

.....

Q5 Describe the purpose of the program below and write in the final output.

```
number = int(input("Type in any whole number..."))
calcNumber = number * 3
calcNumber = calcNumber + 6
calcNumber = calcNumber / 3
guess = calcNumber - number
print("Doesn't matter what starting number you type, this answer is always...",guess)
```

.....

.....

.....

.....

Q6 There are three errors in the following program. Circle the errors in the code and describe them. Rewrite the program in the box below so that it runs correctly.

```
width = int(input("Enter width in metres: "))
height = input("Enter height in metres: "))
area = width x height
print("The area is",area "square metres.")
```

First error: .....

.....

Second error: .....

.....

Third error: .....

.....

Q7 Complete the output box for each calculation.

a)
```
x = 1 + 99
print(x)
```

b)
```
x = 66 - 1
print(x)
```

c)
```
x = 81 / 9
print(x)
```

d)
```
x = 5 * 5
print(x)
```

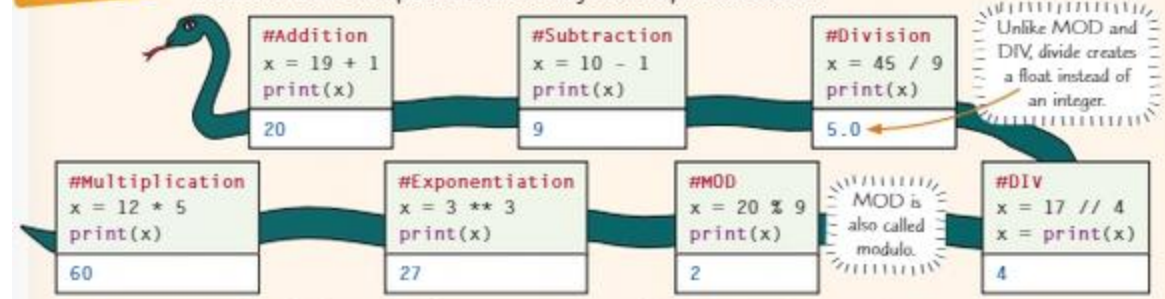
e)
```
x = 10 % 6
print(x)
```

f)
```
x = 10 // 6
x = print(x)
```

Arithmetic operator	+	-	/	*	** (Exponentiation)	% (MOD)	// (DIV)
Description	Add	Subtract	Divide	Multiply	Raises to a power	Returns only the remainder after a division.	Returns the whole number part after a division.

EXAMPLE

Here are some examples of how to carry out simple calculations.



The program below calculates the volume of a room by asking the user three questions.

```
height = int(input("How high is the room in metres?"))
width = int(input("How wide is the room in metres?"))
length = int(input("How long is the room in metres?"))
volume = height * width * length
print("The room is",volume,"square metres")
```

```
How high is the room in metres?2
How wide is the room in metres?3
How long is the room in metres?3
The room is 18 square metres
```

The three user `input()` values are multiplied together to calculate the volume.

The inputs must be cast to numbers as all user inputs are strings by default.

Q1 What would happen if you changed the type of the data from `int` to `float` in this room calculator example?

Q1 Describe two scenarios where a relational operator would be useful.

1 .....

2 .....

Q2 Describe the meaning of the following relational operators.

a) <= .....

b) != .....

c) == .....

Q3 Complete the output for the following train speed control program.

```
currentSpeed = 85
targetSpeed = 90
print("Target speed exceeded: ",currentSpeed > targetSpeed)
```

Q4 For each question below write a line of code that can be typed directly into the Shell that will provide a `True` or `False` response.

a) Is 250 greater than 240?

b) Is 1000 exactly equal to 1000?

c) Is 1999 not equal to 1999?

Challenge 1

The diagram shows the flight path of a satellite around the earth.

A program is needed to calculate the distance between points A and B shown on the diagram. The program should assume that the flight path is circular and points A and B are the same distance apart in both directions along the flight path.

The program should do the following:

- ask the user for the straight-line distance in miles between points A and B
- convert the value to kilometres
- calculate the distance from point A to point B along the flight path
- output the distance (to the nearest kilometre) to the user

Hint: to work out the distance from A to B along the flight path you'll need to work out the circumference of the entire circular flight path. The formula for calculating the circumference of a circle is diameter x pi.

In your program use a value of 3.142 for pi and assume that 1 mile is equal to 1.6 kilometres.

See p.74 for how to use a more accurate value of pi from the `math` module — there's an example program to download which shows this in action.

Challenge 2

A group of students have asked you to create a pocket money savings calculator. They'd like a way to see how much money they can save in a year if they don't spend all of their pocket money each week.

The program should do the following:

- ask the user how much pocket money they get per week
- ask how much of their money they normally spend each week
- use the remaining amount to calculate a total for the year

Remember that amounts of money usually have two decimal places.

To complete the below tasks, you will need to use the online emulator of Python:

https://www.online-python.com/

Once loaded highlight all the lines that are already there and press the delete button

Q1 a) What are selection blocks used for in programming?

.....

.....

b) Name the type of statement that is used for selection in Python.

.....

Q2 The code below is from a program that places people in a particular generation based on their birth year. The code uses two of the three basic building blocks of programming — sequence and selection.

```
01  name = input("What is your name? ")
02  birthYear = int(input("What year were you born in? "))
03
04  if birthYear >= 2012:
05    print(name+", you are a member of Generation Alpha.")
```

There are line numbers in this program but they don't affect the code. You can show these numbers in IDLE by selecting Show Line Numbers in the Options menu.

a) What would be shown to the user if `Fatima` and then `2004` were entered?

.....

b) Inputting `Johann` and then `2k13` would result in an error. Which line would cause the error and why?

.....

.....

c) State the line numbers that show sequence and explain why.

.....

.....

d) State the line numbers which show selection and explain why.

.....

.....

e) The program at the start of the question is continued below. Fill in the gaps so that more generations can be classified. Use the table to define the ranges.

```
06  _____ birthYear ____ _______
07      print(name+", you are a member of _________________.")
08  _____ birthYear ____ _______
09      print(name+", you are a Millennial.")
10  _____
11      print("Mmm, I'm not sure what to classify you as...")
```

Generation	Time span
Millennial Generation	1981-1995
Generation Z	1995-2012
Generation Alpha	After 2012

f) Describe the flow of execution that occurs from line 4 onwards when the `birthYear` is `1982`.

.....

.....

.....

.....

.....

Q3 Work through these programs to determine how many times `Hi` will be outputted to the user.

a)

```
01  animal = "Cat"
02  if animal == "Cat":
03      print("Hi")
04  elif animal == "Cat":
05      print("Hi")
06  elif animal == "Mouse":
07      print("Hi")
08  else:
09      print("Hi")
```

How many times is `Hi` printed? .....

Reasoning: .....

.....

.....

b)

```
01  animal = "Cat"
02  if animal == "Cat":
03      print("Hi")
04  if animal == "Cat":
05      print("Hi")
06  if animal == "Mouse":
07      print("Hi")
08  else:
09      print("Hi")
```

How many times is `Hi` printed? .....

Reasoning: .....

.....

.....

Q4 This code is for the beginning of a video game. An error is preventing it from working properly.

```
01  ready = input("Are you ready to begin? ")
02  if ready == "Yes" or "Y" or "y":
03    print("Let's get started!")
04  else:
05    print("Oh! I see...")
```

```
Are you ready to begin? Absolutely not.
Let's get started!
```

a) What type of error is this?

.....

b) One line causes the error in the program. Explain why and rewrite this line to fix it.

.....

.....

.....

Q5 This program uses nested selection to check if three people have got the same date of birth. Rewrite the code from line 5 onwards so that selection is used, but without nesting.

```
01  person1 = input("What is person 1's birthday? ")
02  person2 = input("What is person 2's birthday? ")
03  person3 = input("What is person 3's birthday? ")
04
05  if person1 == person2:
06    if person2 == person3:
07      print("Wow, what are the odds?")
08    else:
09      print("They aren't all the same.")
10  else:
11    print("They aren't all the same.")
```

```
What is person 1's birthday? 29/06/2000
What is person 2's birthday? 06/06/2009
What is person 3's birthday? 02/11/2001
They aren't all the same.
```

It's time to put the knowledge you've gained to the test. Don't rush through the questions — good programming takes time. Have a crack at the challenges below before visiting the link on the contents page for the Python files.

Challenge 1

Sara is planning her revision timetable for her exams. The table below shows how Sara breaks up her week.

	Monday	Tuesday	Wednesday	Thursday	Friday
Morning	Computer Science	Maths		Computer Science	Music
Afternoon		Science	English	Computer Science	

Write a program for Sara that:

- Asks what day it is and then ask for the time in the 24-hour clock format, e.g. 17.32.
- Tells Sara what subject she should be revising at that point in time, if any.
- Gives her a specific topic to study for two sessions of Computer Science all day Thursday (lucky Sara).

Challenge 2

A Manchester-based airline is having a 'Super Summer Sale'. All flights above 1000 miles have a discount applied to the normal ticket price — 15% for standard class and 30% for first class. Flights that are 1000 miles or less have a 7.5% discount applied to standard-class tickets and a 10% discount applied to first-class tickets.

Your program should meet the following requirements:

- A customer is asked to enter one of the four destinations below and the type of ticket. They then receive the correct discounted price.
- Alternatively, if a customer is flying to a destination not in the table, then they should be able to enter the normal ticket price, the ticket type, and the flight distance before receiving the correct discounted price.
- All prices printed to the customer should be given in pounds and pence, e.g. £220.55.

Destination	Normal ticket price (£)		Flight distance (miles)
	Standard class	First class	
Ålesund Vigra (AES)	106	N/A	700
Shanghai Hongqiao (SHA)	1000	2200	5700
Bucharest Otopeni (OTP)	95	190	1400
Toulouse (TLS)	115	210	690

`round()` is a useful function for displaying prices.

```
print(round(35.986,2))
35.99
```

Set this number to the number of decimal places you want to round to.

To complete the below tasks, you will need to use the online emulator of Python:

https://www.online-python.com/

Once loaded highlight all the lines that are already there and press the delete button