**Python Exercises**

Remember to take a print screen of your solution and place it in a **PowerPoint file called Python Exercises**

**Section 1: Using Variables**

**Coding Challenge 1:** **Cakes**   
Can you write a program to calculate the number of cakes needed for a children’s party? There are 25 children coming and they will each eat 2 cakes.

**Coding challenge 2:** **House points**  
Write a program to calculate the total number of house points 4 classes got in a school. The first class got 23 points, the second class got 47 points, the third class got 56 points and the fourth class got 73 points.

**Coding challenge 3: Enterprise**  
In an enterprise activity, 3 students make £620 by selling products they have made. Their total costs were £400. Write a program to calculate how much money they make each after they have paid their costs.

**Coding challenge 4: Enterprise2**Now can you add in a print statement that says that “The profit made is x” where x is the profit they made in challenge 3.

*Clue: You need to convert the number into a string to include it in the print statement.*

**Section 2: Using Inputs**

**Coding challenge 5:** **Groups**  
Write a program which asks the user to enter how many children are in a group and how many groups there are. The program should then output how many children there are in the class.

**Coding challenge 6:** **Groups2**  
Amend challenge 5 so that the program should then output how many whole groups there will be in a sentence reading: There will be …. children in the class. *Clue: You need to convert the number into a string to include it in the print statement.*

**Coding challenge 7:** **Year group**   
Write a program which asks the user their name and which school year they are in. The program should then output a sentence with their name and tells them which school year they will be in next year. (e.g. if they’re in Year 9 now, they will be in Year 10 next year. Year 11 goes to Year 12, etc.)

**Coding challenge 8:** **Birthdays**   
Write a program which asks the user their name and how many days until their next birthday. The program should then output a personalised sentence with a rough approximation of the number of seconds until their next birthday.

**Section 3: Performing Calculations**

**Coding challenge 9: Table size**  
Ask the user to input the length of the table in centimetres. Ask the user to input the width of the table. Output the area of the table.

**Coding challenge 10:** **Table size2**

Change your code from challenge 9 so it asks the user their name first. Then output a print statement that says ‘(Name) your table is …. cm squared.’

**Coding challenge 11:** **Exam scores**

Ask the user to input the total marks for all students who took an exam (e.g. 450). Ask the user how many students there were. Output the average score for each student. *Remember that you can have decimal scores so you may need to convert your input to floats.*

**Coding challenge 12:** **Ages**

Ask the user to input the total of all the ages for all students in the room. Ask the user how many students there are. Then output a print statements that says ‘The average age in this room is ….’.

**Section 4: Conditional Statements**

**Coding challenge 13: Homeworktime**

Ask the user how many hours they spend doing their homework every night. Output ‘That’s about right if they say less than 2 hours.’ Output ‘That’s too long!’ if they say 2 or more hours.

**Coding challenge 14:** **TV**

Ask the user how many hours they spend watching TV every day. Output ‘That’s ok!’ if they say less than 3 hours. If they say 3 or more hours output ‘That’s a lot.’

**Coding challenge 15:** **FavouriteSubject**

Ask the user which is their favourite subject. They should enter 1 for English, 2 for Maths, 3 for Science and 4 for ICT. If they say 1, output ‘That’s great’. If they say 2, output ‘Maths is cool.’ If they say 3, output ‘Science is fun.’. If they say 4, output ‘Me too.’.

**Coding challenge 16:** **French**

Can you program a French dictionary that provides the user with a range of English words to chose from and returns the translation in French? To help you: Dog is ‘le chien’. Cat is’ le chat’. Hamster is ‘le hamster’. Fish is ‘le poisson’. Rabbit is ‘le lapin’.

**Section 5: Iteration - Count Controlled Loops**

**Coding challenge 17: Buffering**

Create a program that prints out the word ‘Buffering….’ 24 times.

**Coding challenge 18:** **Looping**

Create a program that prints out ‘0 Looping’ then ‘1 Looping’ until it gets to 12.

**Coding challenge 19:** **Letters**

Write a program that takes in a letter and number then prints out that letter that many times.

E.g.

Please enter a letter: T

Please enter a number: 6

T

T

T

T

T

T

(it has printed out T 6 times).

**Coding challenge 20:** **Tables**

Write a program that asks for a number then outputs it’s times table up to 10.

E.g.

Please enter a number: 7

1 times 7 is 7

2 times 7 is 14

3 times 7 is 21

4 times 7 is 28

5 times 7 is 35

6 times 7 is 42

7 times 7 is 49

8 times 7 is 56

9 times 7 is 63

10 times 7 is 70

**Section 6: Iteration - Condition Controlled Loops**

**Coding challenge 21: Bouncing**

Print out ‘bouncing’ 8 times, using a while loop.

**Coding challenge 22: Loops**

Create a program that prints out ‘1 Looping’ then ‘2 Looping’ until it gets to 12, using a while loop.

**Coding challenge 23: Letters2**

Write a program that takes in a letter and number then prints out that letter that many times using a while loop.

E.g.

Please enter a letter: T

Please enter a number: 6

T

T

T

T

T

T

(it has printed out T 6 times).

**Coding challenge 24: Squares**

The sequence 1,4,9,16,25 is made up of square numbers (i.e.1=12, 4 = 22, 9=32 etc.).

Write a program that writes out all the square numbers under 5000.

**Section 7: Using random and time modules**

**Coding challenge 25: Number**

Generate a random number between 1 and 100.

**Coding challenge 26: Odds**

Generate a random odd number between 1 and 30.

**Coding challenge 27: Guess** (Remember to comment up your code to explain it.)

Write a program in which the computer thinks of a number between 1 and 100 (i.e. picks number at random). It should then ask the user to guess what number it is thinking of. It should then say whether the number the computer is thinking of is higher or lower than the one guessed. If the user guess correctly it should say well done and say how many guesses it took them, if not it asks them to guess again.

E.g.

I am thinking of a number between 1 and 100

Please guess my number: 50

That number is too high, please guess again: 10

That number is too high, please guess again: 5

That number is too low, please guess again: 7

You have guessed correctly, well done!

**Coding challenge 28: Sleep**

Write a program that asks the user to ask them a question. It should then say “I’m thinking” every 4 seconds for a total of 5 times and then answer “I don’t know the answer”.

E.g.

What is your question?

I’m thinking (wait 4 seconds)

I’m thinking (wait 4 seconds)

I’m thinking (wait 4 seconds)

I’m thinking (wait 4 seconds)

I’m thinking (wait 4 seconds)

I don’t know the answer.

**Section 8: Using functions (subroutines)**

**Coding challenge 29: Sleeping**

Write a function that will print out a given piece of text, a set number of times. Call the function with the text “I’m still sleeping!” for 4 times and then “I’m awake!” 7 times and then “No I’m not!!!!” once.

**Coding challenge 30: Tripling**

Write a function called triple that will triple a given number (i.e. multiply it by 3). Call the function with the number 15, then 4 and then 6.

E.g.

Triple 15 is

45

Triple 14 is

42

Triple 6 is

18

**Coding challenge 31: Radius**

Write a function called circle that takes in a float representing the radius and returns the area of a circle. (Remember that the area of a circle = 3.141592 \* radius \* radius).

Then call your function from this main program:

print circle(1.0)

print circle(2.0)

print circle(3.0)

**Coding challenge 32: Rectangle**

Write a function called rectangle that takes in two floats representing the length and width and returns the area of the rectangle.

Then call your function from this main program:

print rectangle(1.0,2.5)

print rectangle(12.3,1.5)

print rectangle(1.4,1.8)

**Section 9: Using lists**

**Coding challenge 33: Colours**

Write a program that has a list of three of colours (red, blue, green) and prints this out. It should then add yellow to the list and print it out. It should then remove blue and print out the length of the list.

**Coding challenge 34: Months**

Write a program that has a list of three of months (January, February, March) and prints this out. It should then add April to the list and print it out. It should then remove the 2nd item on the list and print out the length of the list and the full list.

**Coding challenge 35: Name\_generator**

Write a program that keeps asking for names until the word END is entered at which point it prints out the number of names and the list of names. (Hint: You will need to ask for the input inside a while loop).

E.g

Please enter a name: Alfred

**Note:** These challenges are getting harder! You will need to use all your previous knowledge as well as the new items for this list. Make sure you test them properly so that they work exactly as you want!

Please enter a name: Bradley

Please enter a name: Connor

Please enter a name: David

Please enter a name: Emily

Please enter a name: END

You have entered 5 names.

['Alfred', 'Bradley', 'Connor', 'David', 'Emily']

**Coding challenge 36: Name\_chooser**

Write a program that asks the user to enter 5 names which it stores in a list. Next, get it to pick one of these names at random and declare that person as the winner. (Hint: You will need to generate a random number.)

**Remember** to comment up your code so you know what you have done when you look back at it.

You will have to do this in your controlled assessment!

E.g.

Please enter name: Sarah

Please enter name: Nathan

Please enter name: Aniela

Please enter name: Safiya

Please enter name: Bob

Well Done Bob you are the winner!

**Section 10: String handling**

**Coding challenge 37: Sentence1**

Write a program that takes the sentence ‘I like to go on holiday by the sea.’ and prints out each character on a new line.

**Coding challenge 38: Sentence2**

Write a program that takes the sentence ‘I like to go on holiday by the sea.’ and prints the length of the string. It should also then print the 8th – 24th characters.

**Coding challenge 39: Sentence3**

Write a program that asks the user for a sentence. It should then count the number of occurrences of the lowercase letter a in the sentence.

**Coding challenge 40: Sentence4**

Write a program that takes in a word and says whether or not it is a palindrome.

(A palindrome is a word that is the same backwards as forwards like noon and radar)

**Section 11: Reading and writing to files**

**Coding challenge 41: Writing1**

Write a program that writes the sentence ‘I like to go on holiday by the sea’ to a file called holiday.txt

**Coding challenge 42: Writing2**

Amend your writing 1 program so that it writes the following sentences below:

I like to go on holiday by the sea.

Oh yes I do.

It is great fun splashing in the waves.

But best of all I like to build sandcastles.

**Coding challenge 43: Reading1**

Write a program that reads the content of holiday.txt

**Coding challenge 44: Reading1**

Write a program that reads the content of holiday.txt, one line at a time.

**Section 12: Handling Errors**

**Coding challenge 45: Float\_Number**

Write a program that checks that the value entered is a floating point number. Check the program works by entering an integer to see if an error is raised. If a float is entered it should output the number.

**Coding challenge 46: Big\_Number**

Write a program that checks that the value entered is bigger than 100. Check the program works by entering a number larger than 100 to see if an error is raised. If a number under 100 is entered it should output the number.

**Coding challenge 47: File\_opening**

Write a program that tries to open the holiday.txt and print the contents. Check the program works by changing the file name to holiday1.txt and check an error is raised.