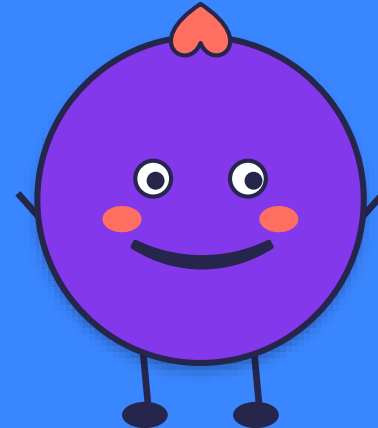
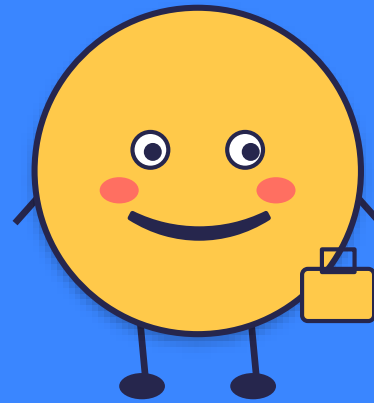
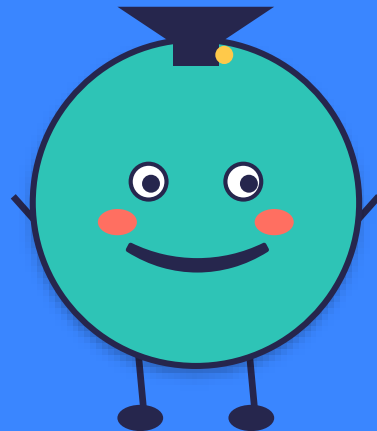
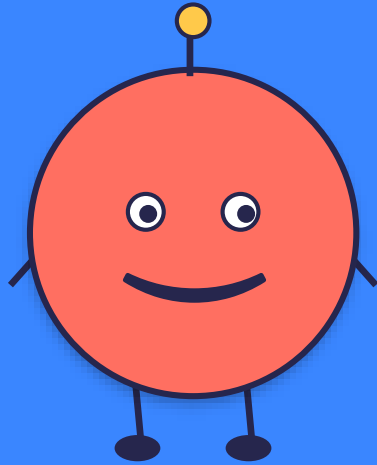


THE Nwanyi Club

TECH • GCSE • ONLINE SAFETY • CAREERS



Our Aims

A fun, interactive club where children learn something new every session.



Explore Tech

Discover something new about technology every session



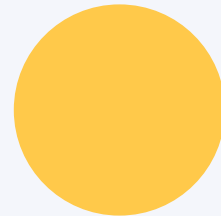
Stay Safe Online

Understand social media and why online safety matters



GCSE Support

Build confidence with GCSE Computer Science topics

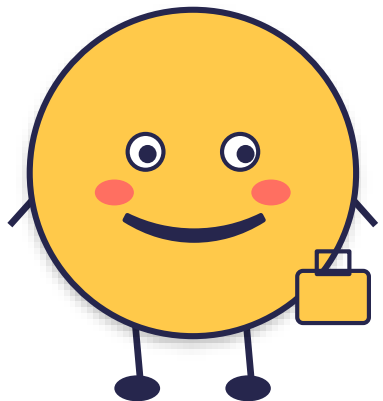


Career Paths

Learn how different tech careers work

ICE BREAKER

Kahoot Quiz

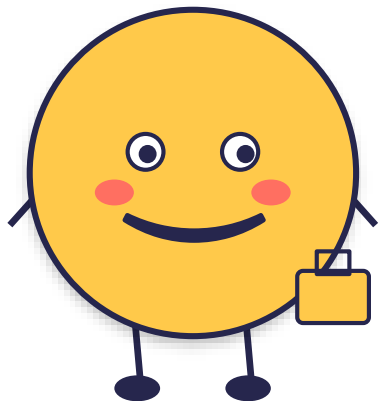


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Introduction to Social Media



What is Social Media



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Advantages/ Disadvantages of Social Media

Advantages

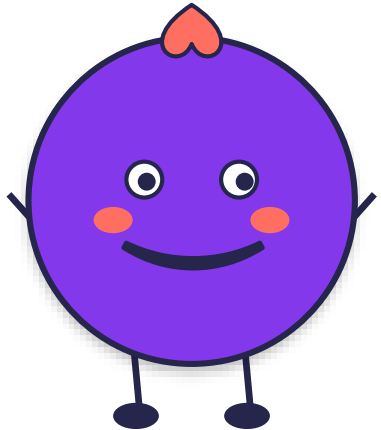
- It helps us stay in touch with friends
- Educational Opportunities
- Business and Marketing Growth

Disadvantages

- Disinformation – false news
- Polarization – Creating a bubble around you
- Over consumption can lead to health problems

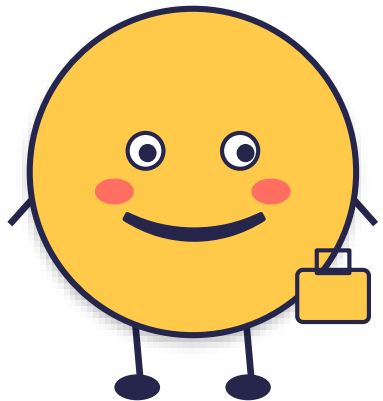
Alternatives To Social Media

- Read a Book
- Watch a Movie
- Play a Game
- Do an Activity like Swimming or Football



Activity

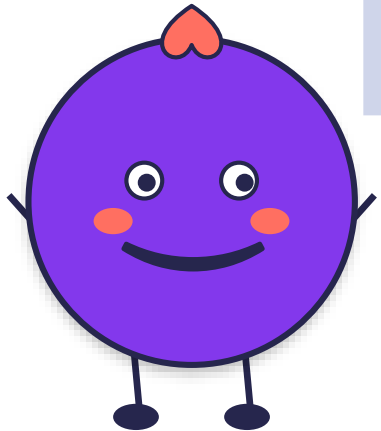
Sorting out Do's and Don'ts



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The Do's and Don't of Social Media

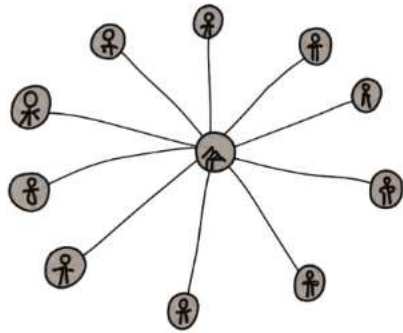
Do	Don't
Think Twice before sharing information on Social media . Your activity creates a digital footprint	Don't Be a bully. Report it.
Only Click on links you are familiar with and trust	Don't Share personal Information
Secure accounts with 2FA	Don't Post Information about yourself when you aren't at home
Respect people's privacy	Don't tag locations you were in
Make sure you know who you add as a friend on the platform	Don't use simple passwords and don't reveal them to anyone



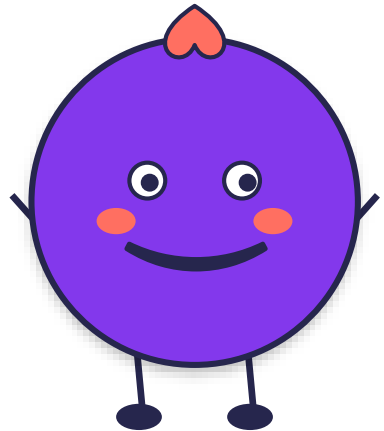
Understanding Social Networks as Graphs



Social Graph



Interest Graph

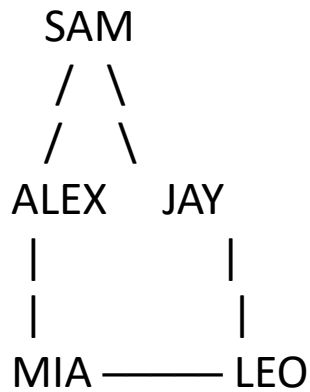


The Social Graph is an algorithm that prioritizes social media feeds to display content from the people and topics/hashtags followed by the user.

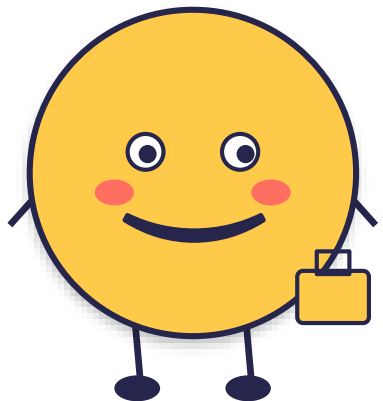


The Interest Graph is an algorithm that focuses on building the feed by analyzing the various interests, preferences, and behaviors of the individual users on the platform.

Activity



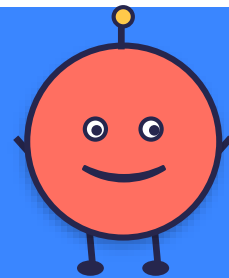
1. Draw A Social Graph and an Interest Graph
2. Which Social Media platforms use the graph



5 min

BREAK

Snacks, games and time
to recharge with friends



Introduction to Algorithms

An algorithm is a list of rules to follow in order to complete a task or solve a problem. It defines the steps to produce the desired Outcome

Use Cases

- Searching The Web
- Completing your sentences – Auto complete
- Transportation – Finding the shortest path
- Daily E commerce – Purchasing Items
- Data Compression – Compressing Images

The efficiency of an algorithm is measured by its time and space complexity.

How It Works

- Input – This is the data given to it
- Processing – This is the steps, decisions, operations it needs to repeat or perform
- Output – Once It is done it returns a result
- End – Every Algorithm needs to End

Search Algorithm

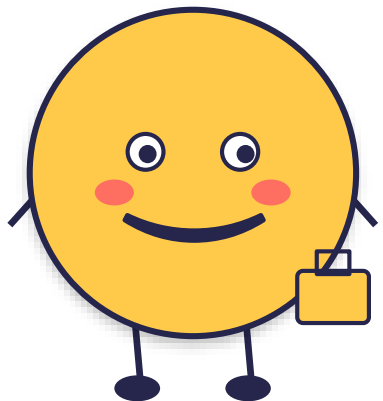
Sorting Algorithm

Shortest Path Algorithm

**Encryption
Algorithm**

**Recommendation
Algorithm**

**Classification
Algorithm**



Algorithms - Sorting

What is Sorting

Sorting is arranging Data in a Particular format e.g Alphabetical, Lowest to Highest.

Types of Sorting Algorithms

- Bubble sort
- Insertion Sort
- Selection Sort
- Merge Sort
- Shell Sort

Use Cases

It is used for learning how sorting works but inefficient for large data sets

How Does Bubble Sort Work

Bubble sort is a simple Sorting algorithm

- It takes pairs of adjacent elements
- It compares them
- It swaps them if they are in the wrong order
- It repeats this process until the list is sorted.

The algorithm can stop when:

a complete pass requires no swaps, meaning the list is sorted; **OR**

the maximum number of passes ($n - 1$) has been completed, which guarantees the list is sorted.

Disadvantages

It is inefficient for Large Data Sets because it requires many comparisons/swaps

Activity – Sort These In Alphabetical Order

1. First Sort It using bubble sort
2. Draw Final Sorted list as an Image of Flags/Fruits

Congo

Japan

UK

Ghana

Yemen

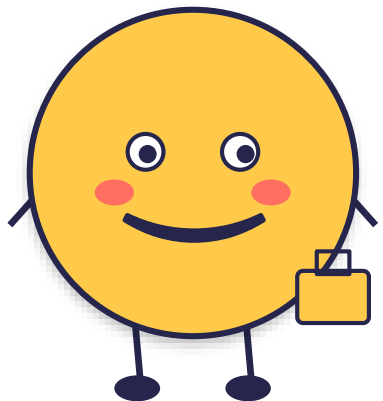
Mango

Apple

Banana

Orange

Melon



Algorithms - Sorting

```
def bubble_sort(list):  
    n = len(list)  
  
    for i in range(n-1):  
        for j in range(n-1):  
            if list[j] > list[j+1]:  
                tmp = list[j]  
                list[j] = list[j+1]  
                list[j+1] = tmp  
  
    return list  
  
def main():  
    list = [3, 9, 2, 1]  
    bubble_sort(list)  
    print(list)  
  
main()
```

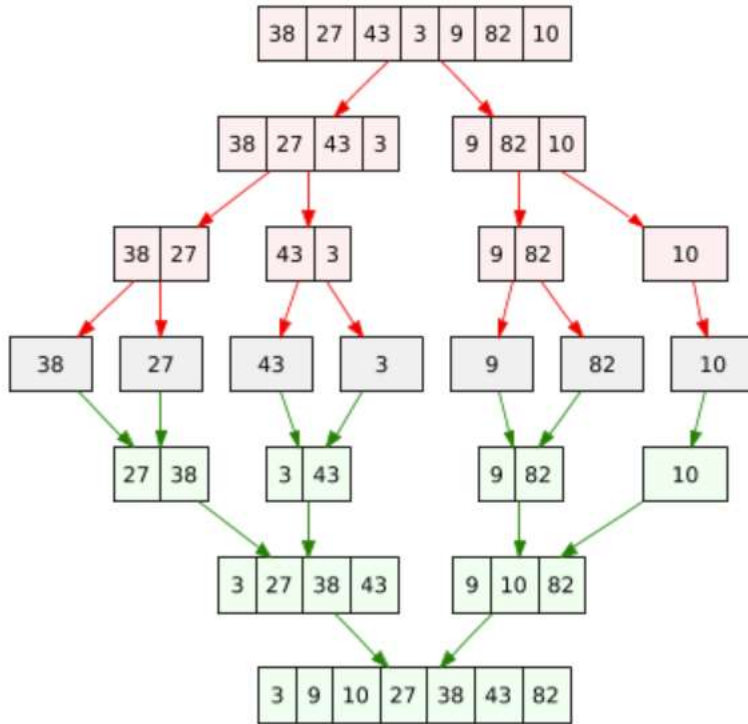
**Best
Case:
 $O(n^2)$**

```
def bubble_sort(list):  
    n = len(list)  
  
    for i in range(n - 1):  
        swapped = False  
  
        for j in range(n - 1):  
            if list[j] > list[j + 1]:  
                tmp = list[j]  
                list[j] = list[j + 1]  
                list[j + 1] = tmp  
  
        swapped = True  
  
        if not swapped:  
            break  
  
    return list
```

**Best
Case:
 $O(n)$**

**Worst
Case:
 $O(n^2)$**

Algorithms - Sorting



Best and Worst Case: $O(n \log n)$

How Does Merge Sort Work

Merge Sort is a **divide-and-conquer sorting algorithm**.

- It **divides the list into two halves**
- It keeps dividing the halves until each part has **one element**
- It **merges** the smaller parts back together in the correct order
- It repeats this process until the **whole list is sorted**

Advantages

It is **efficient for large data sets** because it has **$O(n \log n)$** time complexity.

Disadvantages

It **requires extra memory** to store the temporary lists used during merging.

Activity – Sort These In Highest To Lowest

1. First Sort It using Merge sort
2. Draw Final Sorted list as an Image of Flags/Fruits

10

50

30

20

200

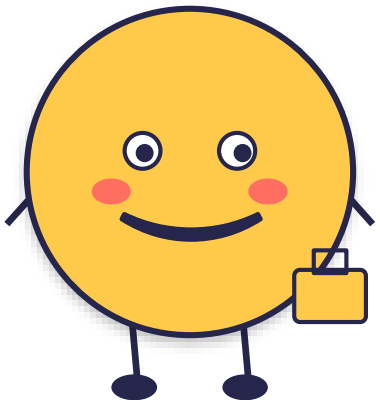
£15

£60

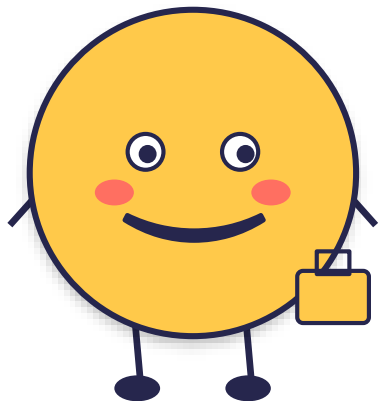
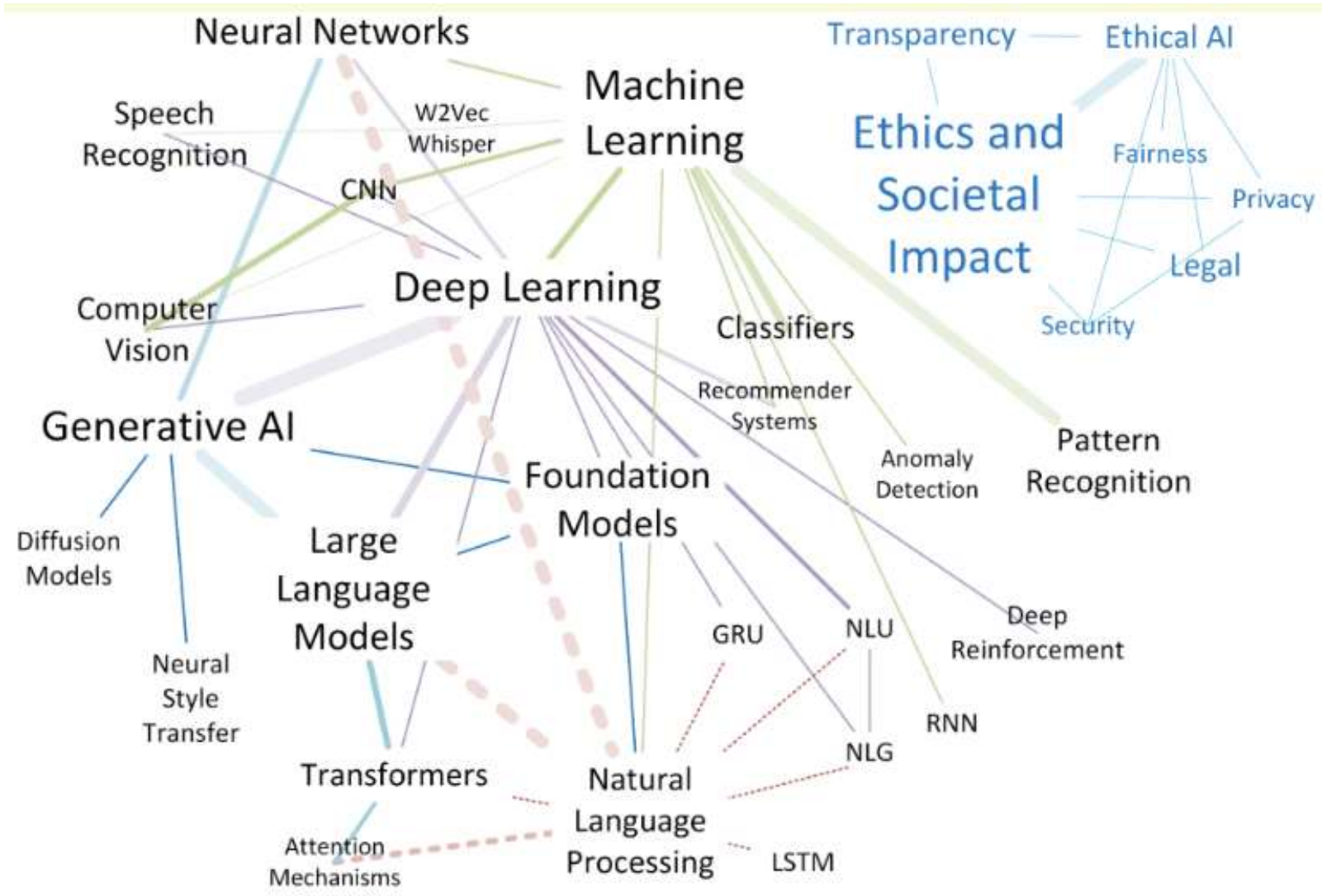
£18

£12

£9



Introduction To Artificial Intelligence



Introduction To Artificial Intelligence

What is AI

It is a technology that allows computers to **learn from information**, recognise patterns, make predictions or decisions, and solve problems.

Machine Learning is a way of **training computers to learn** patterns from data and use what they learn to make predictions or decisions.



Key Idea

DATA → PATTERNS → TRAINING → PREDICTION / DECISION

Pictures of cats and dogs → AI finds patterns → AI is trained → New picture → “I predict this is a cat.”

Neural Networks

A neural network is a type of machine-learning model that learns patterns from data using connected layers of artificial neurons

Training:

Data → Neural Network → Learns Patterns

Using what it learned:

New Data → Neural Network → Prediction

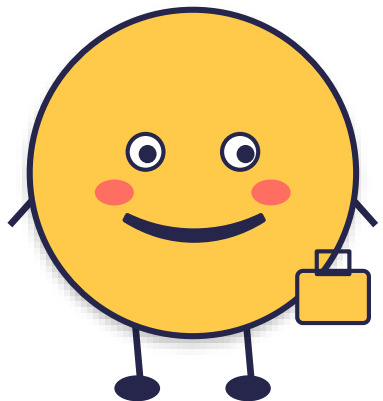
Drawing Activity -

<https://quickdraw.withgoogle.com/>



Can a neural network learn to recognize doodling?

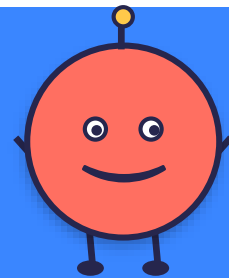
Help teach it by adding your drawings to the world's largest doodling data set, shared publicly to help with machine learning research.



10 min

BREAK

Snacks, games and time
to recharge with friends



Introduction to Data types

WEEK _1_

What are Data Types

A variable is a container that holds a value . Each Variable has a data type. The data type determines what type of value the variable will hold.

Importance of Data types

- It help programs know how to interpret and process the information. E.g performing calculations
- Memory Efficiency
- Performance Optimization
- Data Validation

Data type	Purpose	Example
Integer	Whole numbers	27
Real	Decimal numbers	27.5
Character	A single alphanumeric character	A
String	One or more alphanumeric characters	ABC
Boolean	TRUE/FALSE	TRUE

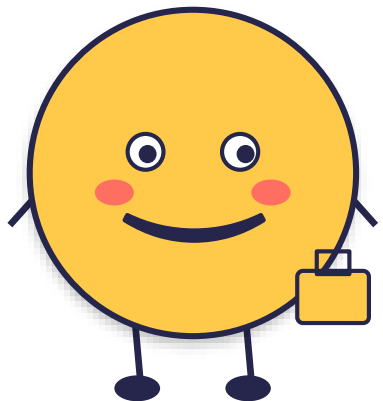
Application To Real Life

Sometimes a programmer needs to change the data type of the contents of a variable. This process is known as casting. E.g

`str(68)` returns "68"
`int("54")` returns 54

Activity

Data types Quiz

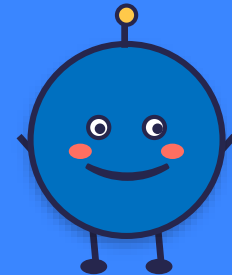
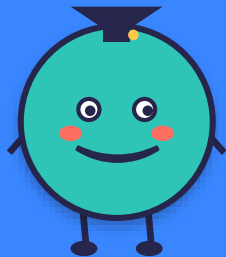


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Reflection

**Write Down Two Things You Have Learnt
Today**

**Would you want there to be Another
Session?**



See You Next Week!

