**Object-Oriented Programming is a programming language model in which programms are organized around data, or objects, rather than functions and logic. An object can be defined as a data field that has unique attributes and behaviour. Examples of an object can range from physical entities, such as a human being that is described by properties like name and address, down to small computer programs, such as widgets. This opposes the historical approach to programming where emphasis was placed on how the logic was written rather than how to define the data within the logic.**[**¶**](https://render.githubusercontent.com/view/ipynb?commit=9cc618a9961ffee699aebfea66761bb4da2c6d12&enc_url=68747470733a2f2f7261772e67697468756275736572636f6e74656e742e636f6d2f617761697368616c65706f74612f507974686f6e2d41737369676e6d656e742f396363363138613939363166666565363939616562666561363637363162623464613263366431322f41737369676e6d656e745f365f41776169732e6970796e62&nwo=awaishalepota%2FPython-Assignment&path=Assignment_6_Awais.ipynb&repository_id=223433012&repository_type=Repository#Object-Oriented-Programming-is-a-programming-language-model-in-which-programms-are-organized-around-data,-or-objects,-rather-than-functions-and-logic.-An-object-can-be-defined-as-a-data-field-that-has-unique-attributes-and-behaviour.-Examples-of-an-object-can-range-from-physical-entities,-such-as-a-human-being-that-is-described-by-properties-like-name-and-address,-down-to-small-computer-programs,-such-as-widgets.-This-opposes-the-historical-approach-to-programming-where-emphasis-was-placed-on-how-the-logic-was-written-rather-than-how-to-define-the-data-within-the-logic.)

**Question 2**[**¶**](https://render.githubusercontent.com/view/ipynb?commit=9cc618a9961ffee699aebfea66761bb4da2c6d12&enc_url=68747470733a2f2f7261772e67697468756275736572636f6e74656e742e636f6d2f617761697368616c65706f74612f507974686f6e2d41737369676e6d656e742f396363363138613939363166666565363939616562666561363637363162623464613263366431322f41737369676e6d656e745f365f41776169732e6970796e62&nwo=awaishalepota%2FPython-Assignment&path=Assignment_6_Awais.ipynb&repository_id=223433012&repository_type=Repository#Question-2)

**Easier troubleshooting**[**¶**](https://render.githubusercontent.com/view/ipynb?commit=9cc618a9961ffee699aebfea66761bb4da2c6d12&enc_url=68747470733a2f2f7261772e67697468756275736572636f6e74656e742e636f6d2f617761697368616c65706f74612f507974686f6e2d41737369676e6d656e742f396363363138613939363166666565363939616562666561363637363162623464613263366431322f41737369676e6d656e745f365f41776169732e6970796e62&nwo=awaishalepota%2FPython-Assignment&path=Assignment_6_Awais.ipynb&repository_id=223433012&repository_type=Repository#Easier-troubleshooting)

**Reuse code using inheritance**[**¶**](https://render.githubusercontent.com/view/ipynb?commit=9cc618a9961ffee699aebfea66761bb4da2c6d12&enc_url=68747470733a2f2f7261772e67697468756275736572636f6e74656e742e636f6d2f617761697368616c65706f74612f507974686f6e2d41737369676e6d656e742f396363363138613939363166666565363939616562666561363637363162623464613263366431322f41737369676e6d656e745f365f41776169732e6970796e62&nwo=awaishalepota%2FPython-Assignment&path=Assignment_6_Awais.ipynb&repository_id=223433012&repository_type=Repository#Reuse-code-using-inheritance)

**Flexibility through Polymorphism**[**¶**](https://render.githubusercontent.com/view/ipynb?commit=9cc618a9961ffee699aebfea66761bb4da2c6d12&enc_url=68747470733a2f2f7261772e67697468756275736572636f6e74656e742e636f6d2f617761697368616c65706f74612f507974686f6e2d41737369676e6d656e742f396363363138613939363166666565363939616562666561363637363162623464613263366431322f41737369676e6d656e745f365f41776169732e6970796e62&nwo=awaishalepota%2FPython-Assignment&path=Assignment_6_Awais.ipynb&repository_id=223433012&repository_type=Repository#Flexibility-through-Polymorphism)

**Effective problem solving**[**¶**](https://render.githubusercontent.com/view/ipynb?commit=9cc618a9961ffee699aebfea66761bb4da2c6d12&enc_url=68747470733a2f2f7261772e67697468756275736572636f6e74656e742e636f6d2f617761697368616c65706f74612f507974686f6e2d41737369676e6d656e742f396363363138613939363166666565363939616562666561363637363162623464613263366431322f41737369676e6d656e745f365f41776169732e6970796e62&nwo=awaishalepota%2FPython-Assignment&path=Assignment_6_Awais.ipynb&repository_id=223433012&repository_type=Repository#Effective-problem-solving)

**Question 3**[**¶**](https://render.githubusercontent.com/view/ipynb?commit=9cc618a9961ffee699aebfea66761bb4da2c6d12&enc_url=68747470733a2f2f7261772e67697468756275736572636f6e74656e742e636f6d2f617761697368616c65706f74612f507974686f6e2d41737369676e6d656e742f396363363138613939363166666565363939616562666561363637363162623464613263366431322f41737369676e6d656e745f365f41776169732e6970796e62&nwo=awaishalepota%2FPython-Assignment&path=Assignment_6_Awais.ipynb&repository_id=223433012&repository_type=Repository#Question-3)

**A function is a piece of code usually written in the scope of global code or in a function itself(nested funcitons).**[**¶**](https://render.githubusercontent.com/view/ipynb?commit=9cc618a9961ffee699aebfea66761bb4da2c6d12&enc_url=68747470733a2f2f7261772e67697468756275736572636f6e74656e742e636f6d2f617761697368616c65706f74612f507974686f6e2d41737369676e6d656e742f396363363138613939363166666565363939616562666561363637363162623464613263366431322f41737369676e6d656e745f365f41776169732e6970796e62&nwo=awaishalepota%2FPython-Assignment&path=Assignment_6_Awais.ipynb&repository_id=223433012&repository_type=Repository#A-function-is-a-piece-of-code-usually-written-in-the-scope-of-global-code-or-in-a-function-itself(nested-funcitons).)

**We have to call a function by it's name explicitly and if needed we have to pass the parameters too.**[**¶**](https://render.githubusercontent.com/view/ipynb?commit=9cc618a9961ffee699aebfea66761bb4da2c6d12&enc_url=68747470733a2f2f7261772e67697468756275736572636f6e74656e742e636f6d2f617761697368616c65706f74612f507974686f6e2d41737369676e6d656e742f396363363138613939363166666565363939616562666561363637363162623464613263366431322f41737369676e6d656e745f365f41776169732e6970796e62&nwo=awaishalepota%2FPython-Assignment&path=Assignment_6_Awais.ipynb&repository_id=223433012&repository_type=Repository#We-have-to-call-a-function-by-it's-name-explicitly-and-if-needed-we-have-to-pass-the-parameters-too.)

**On the other hand, A method is defined inside an object's or class's definition. We can access this object by the name of the class or the object and we don't have to pass parameters explicitly.**[**¶**](https://render.githubusercontent.com/view/ipynb?commit=9cc618a9961ffee699aebfea66761bb4da2c6d12&enc_url=68747470733a2f2f7261772e67697468756275736572636f6e74656e742e636f6d2f617761697368616c65706f74612f507974686f6e2d41737369676e6d656e742f396363363138613939363166666565363939616562666561363637363162623464613263366431322f41737369676e6d656e745f365f41776169732e6970796e62&nwo=awaishalepota%2FPython-Assignment&path=Assignment_6_Awais.ipynb&repository_id=223433012&repository_type=Repository#On-the-other-hand,-A-method-is-defined-inside-an-object's-or-class's-definition.-We-can-access-this-object-by-the-name-of-the-class-or-the-object-and-we-don't-have-to-pass-parameters-explicitly.)

**Question 4**[**¶**](https://render.githubusercontent.com/view/ipynb?commit=9cc618a9961ffee699aebfea66761bb4da2c6d12&enc_url=68747470733a2f2f7261772e67697468756275736572636f6e74656e742e636f6d2f617761697368616c65706f74612f507974686f6e2d41737369676e6d656e742f396363363138613939363166666565363939616562666561363637363162623464613263366431322f41737369676e6d656e745f365f41776169732e6970796e62&nwo=awaishalepota%2FPython-Assignment&path=Assignment_6_Awais.ipynb&repository_id=223433012&repository_type=Repository#Question-4)

**1. Class**[**¶**](https://render.githubusercontent.com/view/ipynb?commit=9cc618a9961ffee699aebfea66761bb4da2c6d12&enc_url=68747470733a2f2f7261772e67697468756275736572636f6e74656e742e636f6d2f617761697368616c65706f74612f507974686f6e2d41737369676e6d656e742f396363363138613939363166666565363939616562666561363637363162623464613263366431322f41737369676e6d656e745f365f41776169732e6970796e62&nwo=awaishalepota%2FPython-Assignment&path=Assignment_6_Awais.ipynb&repository_id=223433012&repository_type=Repository#1.-Class)

**A class is a user defined datatype that programmers used to create other objects of any given class's type, A class is an entity that determines how an object will behave and what the object will contain. In other words, it is a blueprint or a set of instruction to build a specific type of object.**[**¶**](https://render.githubusercontent.com/view/ipynb?commit=9cc618a9961ffee699aebfea66761bb4da2c6d12&enc_url=68747470733a2f2f7261772e67697468756275736572636f6e74656e742e636f6d2f617761697368616c65706f74612f507974686f6e2d41737369676e6d656e742f396363363138613939363166666565363939616562666561363637363162623464613263366431322f41737369676e6d656e745f365f41776169732e6970796e62&nwo=awaishalepota%2FPython-Assignment&path=Assignment_6_Awais.ipynb&repository_id=223433012&repository_type=Repository#A-class-is-a-user-defined-datatype-that-programmers-used-to-create-other-objects-of-any-given-class's-type,-A-class-is-an-entity-that-determines-how-an-object-will-behave-and-what-the-object-will-contain.-In-other-words,-it-is-a-blueprint-or-a-set-of-instruction-to-build-a-specific-type-of-object.)

**2. Object**[**¶**](https://render.githubusercontent.com/view/ipynb?commit=9cc618a9961ffee699aebfea66761bb4da2c6d12&enc_url=68747470733a2f2f7261772e67697468756275736572636f6e74656e742e636f6d2f617761697368616c65706f74612f507974686f6e2d41737369676e6d656e742f396363363138613939363166666565363939616562666561363637363162623464613263366431322f41737369676e6d656e745f365f41776169732e6970796e62&nwo=awaishalepota%2FPython-Assignment&path=Assignment_6_Awais.ipynb&repository_id=223433012&repository_type=Repository#2.-Object)

**An object is nothing but a self-contained component which consists of methods and properties to make a particular type of data useful. Object determines the behavior of the class. When you send a message to an object, you are asking the object to invoke or execute one of its methods. From a programming point of view, an object can be a data structure, a variable or a function. It has a memory location allocated. The object is designed as class hierarchies.**[**¶**](https://render.githubusercontent.com/view/ipynb?commit=9cc618a9961ffee699aebfea66761bb4da2c6d12&enc_url=68747470733a2f2f7261772e67697468756275736572636f6e74656e742e636f6d2f617761697368616c65706f74612f507974686f6e2d41737369676e6d656e742f396363363138613939363166666565363939616562666561363637363162623464613263366431322f41737369676e6d656e745f365f41776169732e6970796e62&nwo=awaishalepota%2FPython-Assignment&path=Assignment_6_Awais.ipynb&repository_id=223433012&repository_type=Repository#An-object-is-nothing-but-a-self-contained-component-which-consists-of-methods-and-properties-to-make-a-particular-type-of-data-useful.-Object-determines-the-behavior-of-the-class.-When-you-send-a-message-to-an-object,-you-are-asking-the-object-to-invoke-or-execute-one-of-its-methods.-From-a-programming-point-of-view,-an-object-can-be-a-data-structure,-a-variable-or-a-function.-It-has-a-memory-location-allocated.-The-object-is-designed-as-class-hierarchies.)

**3. Attributes**[**¶**](https://render.githubusercontent.com/view/ipynb?commit=9cc618a9961ffee699aebfea66761bb4da2c6d12&enc_url=68747470733a2f2f7261772e67697468756275736572636f6e74656e742e636f6d2f617761697368616c65706f74612f507974686f6e2d41737369676e6d656e742f396363363138613939363166666565363939616562666561363637363162623464613263366431322f41737369676e6d656e745f365f41776169732e6970796e62&nwo=awaishalepota%2FPython-Assignment&path=Assignment_6_Awais.ipynb&repository_id=223433012&repository_type=Repository#3.-Attributes)

**In Object-oriented programming(OOP), classes and objects have attributes. Attributes are data stored inside a class or instance and represent the state or quality of the class or instance. In short, attributes store information about the instance.**[**¶**](https://render.githubusercontent.com/view/ipynb?commit=9cc618a9961ffee699aebfea66761bb4da2c6d12&enc_url=68747470733a2f2f7261772e67697468756275736572636f6e74656e742e636f6d2f617761697368616c65706f74612f507974686f6e2d41737369676e6d656e742f396363363138613939363166666565363939616562666561363637363162623464613263366431322f41737369676e6d656e745f365f41776169732e6970796e62&nwo=awaishalepota%2FPython-Assignment&path=Assignment_6_Awais.ipynb&repository_id=223433012&repository_type=Repository#In-Object-oriented-programming(OOP),-classes-and-objects-have-attributes.-Attributes-are-data-stored-inside-a-class-or-instance-and-represent-the-state-or-quality-of-the-class-or-instance.-In-short,-attributes-store-information-about-the-instance.)

**4. Behaviour**[**¶**](https://render.githubusercontent.com/view/ipynb?commit=9cc618a9961ffee699aebfea66761bb4da2c6d12&enc_url=68747470733a2f2f7261772e67697468756275736572636f6e74656e742e636f6d2f617761697368616c65706f74612f507974686f6e2d41737369676e6d656e742f396363363138613939363166666565363939616562666561363637363162623464613263366431322f41737369676e6d656e745f365f41776169732e6970796e62&nwo=awaishalepota%2FPython-Assignment&path=Assignment_6_Awais.ipynb&repository_id=223433012&repository_type=Repository#4.-Behaviour)

**Behavior. A class's behavior determines how an instance of that class operates; for example, how it will "react" if asked to do something by another class or object or if its internal state changes. Behavior is the only way objects can do anything to themselves or have anything done to them.**[**¶**](https://render.githubusercontent.com/view/ipynb?commit=9cc618a9961ffee699aebfea66761bb4da2c6d12&enc_url=68747470733a2f2f7261772e67697468756275736572636f6e74656e742e636f6d2f617761697368616c65706f74612f507974686f6e2d41737369676e6d656e742f396363363138613939363166666565363939616562666561363637363162623464613263366431322f41737369676e6d656e745f365f41776169732e6970796e62&nwo=awaishalepota%2FPython-Assignment&path=Assignment_6_Awais.ipynb&repository_id=223433012&repository_type=Repository#Behavior.-A-class's-behavior-determines-how-an-instance-of-that-class-operates;-for-example,-how-it-will-%22react%22-if-asked-to-do-something-by-another-class-or-object-or-if-its-internal-state-changes.-Behavior-is-the-only-way-objects-can-do-anything-to-themselves-or-have-anything-done-to-them.)