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NPTEL (<https://swayam.gov.in/explorer?ncCode=NPTEL>) » Fundamentals of Object Oriented Programming (course)

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Course outline

About NPTEL ()

Week 1. Assignment 1

The due date for submitting this assignment has passed.

Due on 2025-02-05, 23:59 IST.

Assignment submitted on 2025-02-01, 16:27 IST

1) Which of the following OOP principles ensures that a derived class can modify behavior inherited from a base class?

1 point

- ☐ Inheritance
- ☐ Abstraction
- ☐ Encapsulation

How does an NPTEL online course work? ()

Week 0 ()

Week 1 ()

☒ Introduction to Object-Oriented Programming (unit?unit=18&lesson=19)

☐ Introduction to Classes and Objects in C++ (unit?unit=18&lesson=28)

☐ Introduction to Member Data and Member Functions in C++ (unit?unit=18&lesson=29)

☐ Introduction to Classes and Objects in Java (unit?unit=18&lesson=30)

☐ Introduction to Paradigms of OOP (unit?unit=18&lesson=31)

☒ **Quiz: Week 1: Assignment 1 (assessment?name=20)**

☐ Solution for Week 1 (unit?unit=18&lesson=92)

Week 2 ()

Week 3 ()

☒ Polymorphism

Yes, the answer is correct.

Score: 1

Accepted Answers:

Polymorphism

2) Which of the following is not a characteristic of object-oriented programming?

1 point

☐ Encapsulation

☐ Polymorphism

☒ Functional composition

☐ Inheritance

Yes, the answer is correct.

Score: 1

Accepted Answers:

Functional composition

3) If a class is considered a “set” in mathematical terms, which of the following could be considered as objects?

1 point

☐ Functions defined on the set

☒ Elements of the set

☐ Subsets of the set

☐ Realized instances of the set (e.g., empty set)

No, the answer is incorrect.

Score: 0

Accepted Answers:

Realized instances of the set (e.g., empty set)

4) Encapsulation can be mathematically represented as:

1 point

☒

$f : X \rightarrow Y$ where X and Y represent private and public data, respectively.

☐

$f : A \rightarrow A$ where f is identity over the class.

Week 4 ()**Week 5 ()****Week 6 ()****Week 7 ()****Week 8 ()****Week 9 ()****Week 10 ()****Week 11 ()****Week 12 ()****Download Videos ()****Weekly Feedback ()**☐ $X = Y$ implying data and methods are the same.☐ $f : X \rightarrow X$ where f is a structure-preserving map over private data.

Yes, the answer is correct.

Score: 1

Accepted Answers:

 $f : X \rightarrow Y$ where X and Y represent private and public data, respectively.

5) Which of the following best describes polymorphism in a mathematical sense?

1 point☒Multiple functions $f_1 : A \rightarrow B$, $f_2 : C \rightarrow D$, etc., with the same name but possibly independent input-output types.☐A single function f defined as $f : A \rightarrow B$ and $f : C \rightarrow D$, operating across different domains and codomains.☐A function $f : A \rightarrow A$ that maps elements within the same domain and codomain.☐A composite function $f \circ g : X \rightarrow Y$, where $g : X \rightarrow Z$ and $f : Z \rightarrow Y$, used to chain operations.

Yes, the answer is correct.

Score: 1

Accepted Answers:

Multiple functions $f_1 : A \rightarrow B$, $f_2 : C \rightarrow D$, etc., with the same name but possibly independent input-output types.

6) Inheritance in OOP is most analogous to:

1 point☒

Set theory: Subsets inheriting properties of supersets.

☐

Group theory: Groups inheriting properties of subgroups.

☐

Graph theory: Nodes inheriting edges.

☐

Linear algebra: Matrices inheriting vector spaces.

Yes, the answer is correct.

Score: 1

Accepted Answers:

Set theory: Subsets inheriting properties of supersets.

7) Which of the following best encapsulates the core purpose of object-oriented programming?

1 point

- ☒ Maximizing code reuse and scalability.
- ☐ Simplifying logical flow in functional applications.
- ☐ Optimizing mathematical operations on datasets.
- ☐ Ensuring type safety at runtime.

Yes, the answer is correct.

Score: 1

Accepted Answers:

Maximizing code reuse and scalability.

8) In an object-oriented system, relationships between objects are best modeled as:

1 point

- ☒ Directed graphs
- ☐ Bipartite graphs
- ☐ Sets with cardinality constraints
- ☐ Undirected graphs

Yes, the answer is correct.

Score: 1

Accepted Answers:

Directed graphs

9) Which of the following best explains the idea of abstraction in OOP?

1 point

- ☒ Hiding unnecessary details and showing only the relevant features.
- ☐ A mapping between two completely unrelated concepts.
- ☐ Defining all possible implementations explicitly in a class.
- ☐ Combining unrelated objects into a single type.

Yes, the answer is correct.

Score: 1

Accepted Answers:

Hiding unnecessary details and showing only the relevant features.

10) Polymorphism in OOP is analogous to which of the following concepts?

1 point

- ☒ A function that behaves differently depending on the input.
- ☐ Using the same name for multiple variables in a program.
- ☐ A method that only works with one specific type of data.
- ☐ Changing the internal logic of a program without altering its behavior.

Yes, the answer is correct.

Score: 1

Accepted Answers:

A function that behaves differently depending on the input.