

Certainly! Here is the complete content package for your application. This includes the **Video Learning Path (Modules 1-6)** and the **Comprehensive Final Exam (20 Questions)** for each track, all in **English**.

You can pass this directly to your Back End developer.



TRACK 1: SOFTWARE ENGINEER

Learning Flow: User watches videos for Module 1 through 6. Once all are completed, the "Final Exam" unlocks.



Module Learning Materials (Video Recommendations)

- Module 1: Python Basics**
 - Description:** Learn the syntax, variables, and control flow of Python.
 - Video:** [Python for Beginners - Full Course](#) (*Programming with Mosh*)
 - Module 2: Data Structures (DSA)**
 - Description:** Understand Big O, Arrays, and Linked Lists to write efficient code.
 - Video:** [Data Structures & Algorithms for Beginners](#) (*Programming with Mosh*)
 - Module 3: Web Basics (HTML/CSS)**
 - Description:** Build the structure and style of websites.
 - Video:** [HTML & CSS Full Course](#) (*SuperSimpleDev*)
 - Module 4: React.js Framework**
 - Description:** Build interactive UIs with Components and Hooks.
 - Video:** [React JS Crash Course](#) (*Programming with Mosh*)
 - Module 5: Backend (Node.js)**
 - Description:** Build server-side applications and APIs.
 - Video:** [Node.js Tutorial for Beginners](#) (*Programming with Mosh*)
 - Module 6: Databases (SQL)**
 - Description:** Learn how to store and retrieve data using SQL.
 - Video:** [SQL Tutorial - Full Course](#) (*FreeCodeCamp*)
-



SOFTWARE ENGINEER FINAL EXAM (Cumulative)

This exam covers topics from Modules 1 through 6.

1. What is the correct file extension for Python files?

- A. .java
- **B. .py (Correct)**
- C. .js
- D. .html

2. In Python, which function is used to output text to the console?

- **A. print() (Correct)**
- B. echo()
- C. console.log()
- D. System.out.println()

3. What does "Big O Notation" measure in Computer Science?

- A. Internet speed
- **B. Time and Space Complexity (Correct)**
- C. The size of the hard drive
- D. Code readability

4. Which data structure follows the LIFO (Last In, First Out) principle?

- A. Queue
- **B. Stack (Correct)**
- C. Array
- D. Tree

5. Accessing an element in an Array by its index has a time complexity of...?

- **A. O(1) (Correct)**
- B. O(n)
- C. O(log n)
- D. O(n²)

6. Which HTML tag is used for the largest heading?

- A. <head>
- **B. <h1> (Correct)**
- C. <h6>
- D. <title>

7. In CSS, which property is used to change the text color?

- A. text-style
- **B. color (Correct)**

- C. font-color
- D. bg-color

8. What does the CSS "Box Model" consist of?

- A. Header, Main, Footer
- **B. Content, Padding, Border, Margin (Correct)**
- C. Flex, Grid, Block
- D. HTML, CSS, JavaScript

9. In React, what is "State"?

- A. A permanent database storage
- **B. An object that holds data that may change over time (Correct)**
- C. A CSS class
- D. A static variable

10. Which React Hook is used to handle side effects (like fetching data)?

- A. useState
- **B. useEffect (Correct)**
- C. useReducer
- D. useHistory

11. Node.js is best described as...?

- A. A frontend framework
- **B. A JavaScript runtime environment built on Chrome's V8 engine (Correct)**
- C. A relational database
- D. A text editor

12. Which command is used to install dependencies in a Node.js project?

- A. git install
- **B. npm install (Correct)**
- C. node add
- D. pip install

13. In an Express.js API, req.body is used to...?

- A. Access URL parameters
- **B. Access data sent in a POST/PUT request (Correct)**
- C. Send a response to the client
- D. Stop the server

14. What does SQL stand for?

- A. Structured Question List

- **B. Structured Query Language (Correct)**
- C. Simple Query Logic
- D. Server Query Layout

15. Which SQL statement is used to retrieve data from a database?

- A. GET
- **B. SELECT (Correct)**
- C. FETCH
- D. PULL

16. A "Primary Key" in a database table must be...?

- A. Nullable
- **B. Unique for each record (Correct)**
- C. Duplicate
- D. Optional

17. What is the result of `10 // 3` in Python?

- A. 3.333
- **B. 3 (Correct)**
- C. 1
- D. 10

18. Which HTTP method is typically used to create a NEW resource?

- A. GET
- **B. POST (Correct)**
- C. PUT
- D. DELETE

19. What is JSX?

- A. A JSON file
- **B. A syntax extension for JavaScript that looks like HTML (Correct)**
- C. A Java library
- D. A CSS preprocessor

20. Which sorting algorithm typically has the worst performance ($O(n^2)$)?

- **A. Bubble Sort (Correct)**
 - B. Merge Sort
 - C. Quick Sort
 - D. Tim Sort
-



TRACK 2: DATA SCIENTIST

Learning Flow: User watches videos for Module 1 through 6. Once all are completed, the "Final Exam" unlocks.



Module Learning Materials (Video Recommendations)

1. **Module 1: Pandas (Python)**
 - **Description:** Learn to manipulate and clean structured data.
 - **Video:** [Complete Python Pandas Tutorial](#) (Keith Galli)
 2. **Module 2: Statistics**
 - **Description:** Master the math behind data: Mean, Median, and Probability.
 - **Video:** [Statistics for Data Science Course](#) (FreeCodeCamp)
 3. **Module 3: Data Visualization**
 - **Description:** Visualize data using Matplotlib and Seaborn.
 - **Video:** [Data Visualization with Python](#) (Derek Banas)
 4. **Module 4: Regression (ML)**
 - **Description:** Predict numerical values using Linear Regression.
 - **Video:** [Linear Regression Explained](#) (StatQuest)
 5. **Module 5: Classification (ML)**
 - **Description:** Predict categories using Logistic Regression and KNN.
 - **Video:** [Logistic Regression Details](#) (StatQuest)
 6. **Module 6: Deep Learning**
 - **Description:** Introduction to Neural Networks and AI.
 - **Video:** [Deep Learning for Beginners](#) (Simplilearn)
-



DATA SCIENTIST FINAL EXAM (Cumulative)

This exam covers topics from Modules 1 through 6.

1. What is the primary data structure used in the Pandas library?

- A. List
- **B. DataFrame (Correct)**
- C. Dictionary

- D. Tensor

2. Which function is used to read a CSV file in Pandas?

- **A. pd.read_csv() (Correct)**
- B. pd.import_csv()
- C. pd.load()
- D. csv.read()

3. What does df.head() display by default?

- A. The last 5 rows
- **B. The first 5 rows (Correct)**
- C. The summary statistics
- D. The column names only

4. The "Median" is defined as...?

- A. The average value
- **B. The middle value in a sorted dataset (Correct)**
- C. The most frequent value
- D. The difference between max and min

5. Which statistical metric measures the spread or dispersion of data?

- A. Mean
- **B. Standard Deviation (Correct)**
- C. Mode
- D. Frequency

6. If a P-Value is less than 0.05, the result is usually considered...?

- A. Random
- **B. Statistically Significant (Correct)**
- C. Invalid
- D. A calculation error

7. Which library is the foundation for data visualization in Python?

- A. Pandas
- **B. Matplotlib (Correct)**
- C. Scikit-learn
- D. TensorFlow

8. Which type of plot is best for showing the distribution of a single numerical variable?

- A. Scatter Plot
- **B. Histogram (Correct)**

- C. Pie Chart
- D. Heatmap

9. A Scatter Plot is primarily used to visualize...?

- A. Categories
- **B. The relationship between two continuous variables (Correct)**
- C. Text data
- D. Hierarchy

10. Linear Regression is used to predict...?

- A. Categories (Yes/No)
- **B. Continuous numerical values (Correct)**
- C. Images
- D. Clusters

11. In Machine Learning, the variable we want to predict is usually labeled as...?

- A. X
- **B. y (Target) (Correct)**
- C. Z
- D. Feature

12. Splitting data into Training and Testing sets helps prevent...?

- A. Underfitting
- **B. Overfitting (Correct)**
- C. Data corruption
- D. Syntax errors

13. Logistic Regression is best suited for which type of problem?

- A. Predicting House Prices
- **B. Binary Classification (Correct)**
- C. Image Generation
- D. Text Translation

14. What is a Confusion Matrix used for?

- A. Evaluating Regression models
- **B. Evaluating Classification performance (Correct)**
- C. Cleaning missing data
- D. Sorting lists

15. In the KNN algorithm, what does "K" stand for?

- A. The number of classes

- **B. The number of nearest neighbors to consider (Correct)**
- C. The distance metric
- D. Kernel size

16. What is the basic unit of a Neural Network?

- A. Pixel
- **B. Neuron (Perceptron) (Correct)**
- C. Cluster
- D. Bit

17. Deep Learning is a subset of Machine Learning that uses...?

- A. Decision Trees
- **B. Multi-layered Neural Networks (Correct)**
- C. Linear equations only
- D. Small datasets

18. Which activation function is commonly used to introduce non-linearity?

- A. Mean
- **B. ReLU (Rectified Linear Unit) (Correct)**
- C. Sum
- D. Linear

19. CNN (Convolutional Neural Networks) are most famous for processing...?

- A. Excel sheets
- **B. Images and Video (Correct)**
- C. Text only
- D. Audio only

20. What is an "Epoch" in Deep Learning training?

- A. One single data point
- **B. One complete pass through the entire training dataset (Correct)**
- C. An error message
- D. The initialization step