1. [**List and describe the six phases of SDLC.**](https://www.tutorialspoint.com/sdlc/sdlc_overview.htm)

* Customer request: The client specifies an issue that must be solved, which serves as the foundation for completing the requirements. All information from customers and users is gathered to produce requirements documentation so that the development team knows exactly what they are working on.
* Analysis: This phase also includes proof-of-concept creation, in which technical feasibility is evaluated and validated before moving on to development work.
* Design: Software architecture, prototypes, and user experience design are all part of this step of the software development life cycle.
* Implementation: Developers must adhere to their organization's coding requirements, and code is generated using programming tools such as compilers, interpreters, and debuggers. The code is written in a variety of high-level programming languages, including C, C++, Pascal, Java, and PHP. The programming language you choose is determined by the software you are creating.
* Integration: As in current SDLC models, this phase is generally a subset of all the stages, and testing operations are primarily concerned with all phases of SDLC. On the other hand, this phrase refers to the product testing phase, during which faults are reported, recorded, fixed, and retested until the product meets quality requirements.
* Maintenance: The program was developed and is now being used in the field. The period of operation and maintenance, on the other hand, remains crucial. Users uncover flaws that were missed during testing at this stage. These problems must be addressed since they might lead to new development cycles. Iterative development models, for example, plan for more features and issue fixes in future versions. A new Development Cycle can be started for each new release.

1. **Which phases of the SDLC is the most important and why?**

Because it is the initial stage, the planning phase is the most crucial. The subsequent steps will fail if a well-organized strategy is not in place. A plan lays the groundwork for the rest of the project's execution.

1. **List the three Python data types discussed in the text and explain their use.**

Integers: is whole numbers.

String: is a sequence of characters enclosed in single or double quotation marks.

Floats: is decimal numbers

1. **What is the difference between a data type and a literal?**

The data types specify the data type represented by the variable that can be performed on those types, while literally how a value of the data type looks to a programmer is stored in the variable.

1. [**Differentiate between the % and // arithmetic operators**](https://runestone.academy/ns/books/published/thinkcspy/SimplePythonData/OperatorsandOperands.html)**?**

The // operator performs integer division and returns a truncated integer result. In contrast, the % operator returns the remainder after division.

Example: 7 divided by 3 is 2 when we use integer quotient, and there is a remainder of 1 when using the modulus.

1. **What is an IDE?**

The Integrated Development Environment (IDE) is a software development environment that is integrated with the Python installation. This program is a tool for writing and testing software. It was created for coders work software code creation, building, and testing, text editors, code libraries, compilers, and test platforms.

1. **Research and discuss three IDE’s for use with Python and Data Science.**

Pycharm: PyCharm is used by the majority of professional developers and is often regarded as the finest IDE for Python programmers. It gives daily advice to help you improve your understanding of using it more efficiently, which is a great feature. It comes in two flavors: community and professional, with the community version being free and the professional version being charged.

IDLE: IDLE is a cross-platform open source IDE that comes pre-installed with Python, so you do not have to bother installing or configuring it. IDLE is a Python IDE designed for beginners who wish to learn how to program in Python. IDLE is a lightweight and simple programming language that may be used to create small projects such as web browser game automation, web scraping programs, and office automation. After learning the basics using IDLE, explore sophisticated IDEs to work on larger projects.

Spyder: Spyder is another excellent Python-based open source and cross-platform IDE. It is also known as Scientific Python Development IDE, and it is the smallest Python IDE available. It is mainly used by data scientists who can combine it with open source software such as Matplotlib, SciPy, NumPy, Pandas, Cython, IPython, SymPy, and others. It ships with the Anaconda package management and has several useful advanced functions, including editing, debugging, and data exploration.

1. **Compare and contrast the three IDE’s you identified, noting capabilities.**

PyCharm is based on the Python programming language, but it also supports a variety of additional languages such as JavaScript, HTML, and CSS. PyCharm users also have access to a collection of code snippets and templates that might help them code faster. Finally, PyCharm gives you a lot of control over how syntax highlighting and code completion are handled.

Spyder comes with a set of solid debugging tools that allow users to easily alter variables and breakpoint situations in order to expedite the debugging process. Spyder also includes a global variable explorer, which will enable users to swiftly assess and change the status of each variable in their code. Spyder is likewise a little software when compared to other IDEs.

IDLE is ideal for running simple scripts on the console, and that's all there is to it. When users do not want or need to open a true IDE like Pycharm, this is a nice alternative.

1. **Which IDE would you choose to use? Why**

IDLE is the most outstanding solution for individuals just learning Python programming. Python IDLE allows you to generate and edit these files quickly. Basic syntax highlighting, code completion, and auto-indent are all included in Python IDLE, as are other capabilities are seen in professional IDEs.