Quiz 1 – A

Duration: 30 minutes

Q1) Please write down your name and student ID [5 pt].

Q2) Categorize the following sentences as either pertaining to "software architecture" or "software design". Justify using aspects like scope, granularity, and type of requirements highlighted [30pt].

- The `OrderProcessor` class will implement the I`OrderProcessor` interface and will use the Strategy pattern for different order validation techniques.

Software Design: This goes into specifics about class implementations and design patterns, which are low-level details.

- Our platform will be deployed across multiple data centers to ensure high availability and resilience against failures.

Software Architecture: Discusses deployment strategies and concerns about availability and resilience, which are architectural decisions.

- The system will utilize a microservices architecture, with each service communicating via RESTful APIs.

Software Architecture: This statement describes a high-level structural choice (microservices) and a communication method (RESTful APIs) between these services.

Q3) Write down the name of your favourite spot (ex. Café, restaurant, library) in campus or in Montréal. The following answer are also acceptable: prefer not to share, I don't have any, who cares, etc. [5 pt].

Please check the other side to answer the last question.

Q4) In the digital integrated circuit design domain, consider a CAD tool flow that utilizes a consistent data format, termed "Design Data Format" (DDF). This flow comprises sequential processes such as RTL synthesis (where a high-level description, like VHDL or Verilog in DDF, is transformed into a gate-level representation in DDF), logic optimization (taking the gate-level DDF and refining it for improved characteristics), physical design (converting the optimized gate-level DDF into physical placement and routing information in DDF), and layout (producing a detailed layout in DDF ready for fabrication). Which software architectural style would be best suited for designing a system to manage this flow? Justify your answer based on the provided requirement [60pt].

The **Pipe-Filter** style's modular and sequential nature perfectly matches the described CAD tool's requirements.

- **Standalone Nature:** CAD tools are non-distributed and standalone. The Pipe-Filter style caters to this by focusing on local data transformations without the complexities of distributed systems.
- **Consistent Data Format:** The use of a uniform "Design Data Format" (DDF) aligns with the Pipe-Filter's emphasis on seamless data flow between processing units.
- **Modularity:** Each CAD process acts like a filter, transforming data and passing it on, ensuring the system's modularity and ease of maintenance.
- **Scalability & Flexibility:** This style allows for easy optimizations, updates, or additions by simply adjusting the corresponding filters.
- **Clear Data Flow:** The linear flow in Pipe-Filter ensures clarity, essential for complex systems like CAD tools.