Task 2: Textutal description of our model::

A ManufacturingSystem stands for a full production line or nested sub-system.

* It has a name string used to identify the production system.
* It lists all piece types that the system can handle.
* It ends at a single StorageFacility where finished pieces arrive.
* It may include one sub ManufacturingSystem nested inside it for a sub-process.
* It holds zero or more Step instances for this system.

A StorageFacility models places where pieces can sit, like bins or warehouses.

* It stores an integer ID and a text name string.
* One or more Step instances may load from or unload into it.
* It holds zero or more WorkPiece instances at a time.

A WorkPiece is a single item moving through the system.

* It has a unique integer ID used for identification and tracking.
* It refers to exactly one WorkPieceType instance as its type.
* It may name a Person who is responsible for tracking it.
* It sits in at most one StorageFacility at a time.
* It links to Steps that consumed it as input and produced it as output.

Step is an abstract concept that runs inside a single ManufacturingSystem.

* It has a duration string value, like “15m” or “PT2H”.
* It consumes one or more input WorkPiece instances as input.
* It produces one or more output WorkPiece instances as results.
* It may use zero or more StorageFacility instances along the way.
* It may emit an output Condition as a completion result.

ProcessStep is a basic action, like machining, welding, or assembly.

TransportStep moves WorkPiece instances between StorageFacility locations and conveyors if needed.

QualityAssuranceStep tests WorkPieces and always has one Condition to evaluate.

Conditions create Boolean tests for quality checks or flow control.

Any Step may emit Conditions; QualityAssuranceStep must emit exactly one Condition.

WorkPieceTypeCondition: Checks if a WorkPiece’s type matches a given WorkPieceType instance.

UnaryCondition: Applies the NOT operator to a single child Condition node.

BinaryCondition: Combines two Condition instances with AND or OR logical operators.

Example:

(NOT (type == "Widget")) OR ((type == "Gadget") AND (...))

WorkPieceType is a catalog entry that holds a name string.

ManufacturingSystem lists WorkPieceTypes it can handle; WorkPieces refer to one type.

Person gives a name to someone responsible for a WorkPiece.