# Exercise 1(B) - Additional Task 3

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| Modelling Based on First Principles | Modelling Based on System Identification |
| Suitable for systems with known parameters and dynamics | Suitable for systems with unknown or unpredictable parameters and dynamics |
| Recommended for lower order systems with simple architectures | Recommended for higher order systems with complex architectures |
| Requires knowledge of physical laws and system dynamics | Requires knowledge of curve fitting (scientific computing tools) |
| Presence of actual plant is not necessary | Presence of actual plant with input and output measurement and recording systems is necessary |
| One type of model can be easily used for other systems with minor (or major) manipulations | Each system has a unique model that must be identified by analyzing input-output relations |
| Extremely complex for higher order systems with non-linear behavior and disturbances | Equally complex for higher and lower order systems (including systems with non-linear behavior and disturbances) |
| Accuracy can be guaranteed (subject to external disturbances) | Accuracy cannot be guaranteed since models are reasonable estimates of the system dynamics |