**MATLAB INTRODUCTION**:

**Overview of the MATLAB Environment**

The MATLAB high-performance language for technical computing integrates computation, visualization, and programming in an easy-to-use environment where problems and solutions are expressed in familiar mathematical notation. Typical uses include

**•** Math and computation

**•** Algorithm development

**•** Data acquisition

**•** Modeling, simulation, and prototyping

**•** Data analysis, exploration, and visualization

**•** Scientific and engineering graphics

**•** Application development,

Including graphical user interface building MATLAB is an interactive system whose basic data element is an array that does not require dimensioning. It allows you to solve many technical computing problems, especially those with matrix and vector formulations, in a fraction of the time it would take to write a program in a scalar noninteractive language such as C or FORTRAN.

The name MATLAB stands for *matrix laboratory*. MATLAB was originally written to provide easy access to matrix software developed by the LINPACK and EISPACK projects. Today, MATLAB engines incorporate the LAPACK and BLAS libraries, embedding the state of the art in software for matrix computation.



**SIMULINK INTRODUCTION**

Simulink is a graphical extension to MATLAB for modeling and simulation of systems. In Simulink, systems are drawn on screen as block diagrams. Many elements of block diagrams are available, such as transfer functions, summing junctions, etc., as well as virtual input and output devices such as function generators and oscilloscopes. Simulink is integrated with MATLAB and data can be easily transferred between the programs. In these tutorials, we will apply Simulink to the examples from the MATLAB tutorials to model the systems, build controllers, and simulate the systems. Simulink is supported on Unix, Macintosh, and Windows environments; and is included in the student version of MATLAB for personal computers. The idea behind these tutorials is that you can view them in one window while running Simulink in another window. System model files can be downloaded from the tutorials and opened in Simulink. You will modify and extend these system while learning to use Simulink for system modeling, control, and simulation. Do not confuse the windows, icons, and menus in the tutorials for your actual Simulink windows. Most images in these tutorials are not live - they simply display what you should see in your own Simulink windows. All Simulink

operations should be done in your Simulink windows.

1. Starting Simulink

2. Model Files

3. Basic Elements

4. Running Simulations

5. Building Systems

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| **EX.NO:** | **Simulation of Hydraulic / Pneumatic cylinder using**  **C / MAT Lab** |
| **DATE:** |

**Aim:**

To simulate the simple Hydraulic cylinder using MATLAB Simulink

**Hardware Required**

P4 Processor, 512 MB RAM, VGA Colour Monitor, 2GB Free Space on

HDD

**Software Required**

MATLAB R2009, Windows XP OS

**Problem Description**

Model a Simple Hydraulic System with single cylinder using simulation of Hydraulic Blocks and observe its behavior under following condition. It contains single acting Hydraulic cylinder which was controlled by an electrically operated 3 way Directional valve. The cylinder drives a load consisting of a mass viscous friction and free loading spring.

**Procedure**

1. Open Matlab

2. Type Simulink in command window

3. Go to Library Browser

4. Pick all Elements in Simulink Hydraulics Library

5. Connect all elements with another element by circuit connector

6. Simulate the Results

**Result**

Thus the Simple Hydraulic cylinder is simulated using MATLAB Simulink.

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| --- | --- |
| **EX.NO:** | **Simulation of cam and follower mechanism using**  **C / MAT Lab.** |
| **DATE:** |

**Aim:**

To simulate the simple cam and follower using MATLAB Simulink

**Hardware Required**

P4 Processor, 512 MB RAM, VGA Colour Monitor, 2GB Free Space on

HDD

**Software Required**

MATLAB R2009, Windows XP OS

**Problem Description**

Model a cam follower and belt System with simulation of Force on belt and

Torque on pulley under the following condition. It is having double dwell cam to

move the belt for 360°. Give the best position to minimize the accelerations.

**Procedure**

1. Open Matlab

2. Type Simulink in command window

3. Go to Library Browser

4. Pick all Elements in Simulink Mechanical Library

5. Connect all elements with another element by circuit connector

6. Simulate the Results

**Result**

Thus the Simple Cam follower and belt system is simulated using MATLAB

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| --- | --- |
| **EX.NO:** | **Simulation of Air conditioning system with condenser temperature and evaporator temperatures as input to get COP using C /MAT Lab** |
| **DATE:** |

**Aim:**

To simulate Air conditioning system with condenser temperature and

evaporator temperatures as input to get COP using MATLAB Simulink

**Hardware Required**

P4 Processor, 512 MB RAM, VGA Colour Monitor, 2GB Free Space on

HDD

**Software Required**

MATLAB R2009, Windows XP OS

**Problem Description**

Model a Air conditioning system with condenser temperature and evaporator temperatures as input to get COP under the following condition. The system models the outdoor environment, the thermal characteristics of the house, and the house heating system.

**Procedure**

1. Open Matlab

2. Type Simulink in command window

3. Go to Library Browser

4. Pick all Elements in Simulink Thermal Library

5. Connect all elements with another element by circuit connector

6. Simulate the Results

**Result**

Thus the Air conditioning system with condenser temperature and evaporator temperatures as input to get COP simulated using MATLAB Simulink.