**DAILY ASSESSMENT FORMAT**

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| **Date:** | **10-06-2020** | **Name:** | **Karthik J** |
| **Course:** | VLSI | **USN:** | **4AL16EC030** |
| **Topic:** | MOS transistor  basics-1 | **Semester & Section:** | **8TH A** |
| **GitHub Repository:** | Karthik-J |  |  |

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| **FORENOON SESSION DETAILS** |
| 7.3    ***MOSFET***  **Introduction**  The MOSFET (Metal Oxide Semiconductor Field Effect Transistor) transistor is a semiconductor device which is widely used for switching and amplifying electronic signals in the electronic devices.  The MOSFET is a core of integrated circuit and it can be designed and fabricated in a single chip because of these very small sizes.  The MOSFET is a four-terminal device with source(S), gate (G), drain (D) and body (B) terminals. The body of the MOSFET is frequently connected to the source terminal so making it a three-terminal device like field effect transistor. The MOSFET is very far the most common transistor and can be used in both analog and digital circuits.  MOSFET  MOSFET  The MOSFET works by electronically varying the width of a channel along which charge carriers flow (electrons or holes).  The charge carriers enter the channel at source and exit via the drain. The width of the channel is controlled by the voltage on an electrode is called gate which is located between source and drain. It is insulated from the channel near an extremely thin layer of metal oxide. The MOS capacity present in the device is the main part MOSFET1The MOSFET can function in two ways Depletion Mode  Enhancement Mode  **Depletion Mode:**  When there is no voltage on the gate, the channel shows its maximum conductance. As the voltage on the gate is either positive or negative, the channel conductivity decreases.  For example  Deflection mode  **Enhancement mode:**  When there is no voltage on the gate the device does not conduct. More is the voltage on the gate, the better the device can conduct. Enhancement modeWorking Principle of MOSFET: The aim of the MOSFET is to be able to control the voltage and current flow between the source and drain. It works almost as a switch. The working of MOSFET depends upon the MOS capacitor. The MOS capacitor is the main part of MOSFET. The semiconductor surface at the below oxide layer which is located between source and drain terminal. It can be  inverted from p-type to n-type by applying a positive or negative gate voltages respectively.  When we apply the positive gate voltage the holes present under the oxide layer with a repulsive force and holes are pushed downward with the substrate. The depletion region populated by the bound negative charges which are associated with the acceptor atoms. The electrons reach channel is formed. The positive voltage also attracts electrons from the n+ source and drain regions into the channel. Now, if a voltage is applied between the drain and source, the current flows freely between the source and drain and the gate voltage controls the electrons in the channel. Instead of positive voltage if we apply negative voltage , a hole channel will be formed under the oxide layer.  MOSFET Block Diagram  MOSFET    MOSFET is also a transistor. We abbreviate it as Metal Oxide Silicon Field Effect Transistor. It will have P-channel and N-channel. It consists of a source, gate and drain. Here we connected a resistive load of 24Ω in series with an ammeter, and a voltage meter connected across the MOSFET. In the transistor the current flow in the gate is in positive direction and source goes to ground. In BJT’s, the current flow is base-to-emitter circuit. But in MOSFET there is no current flow because there is a capacitor at the beginning of the gate, it just requires only voltage. We will know this by doing the simulation process with switching ON/OFF. When the switch is ON there is no current flow in the circuit, when we taken a resistance of 24Ω and 0.29 of ammeter voltage then we find negligible voltage drop across the source because there is +0.21V across MOSFET.  Resistance between drain and source is called RDS. Because of RDS, the voltage drop appears while current flow in circuit. RDS varies depending on the type of MOSFET (it could be 0.001, 0.005, and 0.05 depending on the voltage type).  Finally, we will conclude that, the transistor requires current whereas MOSFET require voltage. The driving requirement for the MOSFET is much better, much simpler as compared to a BJT. |

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| **Date:** | | **10-06-2020** | **Name:** | **Karthik J** |  |
| **Course:** | | CNN for Computer Vision with Keras and TensorFlow in Python | **USN:** | **4AL16EC030** |  |
| **Topic:** | |  | **Semester & Section:** | **8th A** |  |
|  | **AFTERNOON SESSION DETAILS** | | | | |
|  | **Image of session**    Anaconda (Python distribution) - Wikipedia | | | | |
|  | The Jupyter Notebook Interface When a new Jupyter notebook opens, you will see the Jupyter notebook interface. Across the top of the notebook you see the Jupyter icon and the notebook name. You can click on the notebook name field and change the name of the notebook. Note that the file extension .ipynb is not printed in the file name field, but if you look in the Home tab, you will see that the notebook is saved with the .ipynb extension. Menus and Buttons A Jupyter notebook is comprised of a bunch of cells which are arrayed one after another in boxes below the menu items and buttons. There are three main types of cells: code cells, output cells, and markdown cells. Code Cells In code cells, you can write Python code, then execute the Python code and see the resulting output. An example of a code cell is shown below.  A Jupyter notebook code cell  You can tell you are typing in a code cell because In [ ]: is shown to the left of the cell and the cell-type drop-down menu shows **Code**.  To run the Python code in a code cell push the [Run] button or type [Shift]+[Enter]. Hitting [Enter] when the cursor is inside a code cell brings the cursor down to a new line.  The Jupyter notebook run cell button Output Cells After a code cell is run, an output cell can be produced below the code cell. The output cell contains the output from the code cell above it. Not all code produces output, so not all code cells produce output cells. The results in output cells can't be edited. If a code cell produces plots, charts or images, these outputs are shown in output cells.  A Jupyter notebook output cell  You can clear all the output cells and re-run code cells by selecting **[Kernal]** --> **[Restart Kernal and Clear Output]**.  The Jupyter notebook Kernal menu showing Restart and Clear Output selected Markdown Cells Markdown cells don't contain Python code. Markdown cells contain text written in Markdown format. Text in markdown cells can be formatted to show **bold** or italic text. Tables, images, and lists can also be included in markdown cells.  A Jupyter notebook markdown cell. Note Markdown is selected in the cell type menu  Markdown cells are used for documentation and explaining your code. The text in a markdown cell is not executed. Markdown cells can be formatted with a few special characters.  Markdown cells are run like code cells. The difference is that when markdown cells are run, the text is formatted (when code cells run, code is executed). Markdown cells are run by clicking the [Run] button or by pressing [Shift] + [Enter].  Text in markdown cells can be formatted using markdown syntax. An example of markdown syntax is putting an underscore before and after a word to cause the word to be formatted in italics. Headings Headings are created in markdown cells using the hash symbol #. One # is the largest heading. Four hashes #### is the smallest heading.  # H1 Heading  ## H2 Heading  ### H3 Heading  #### H4 Heading Code Blocks Code blocks can be inserted in Jupyter notebook markdown cells. For inline code blocks use the ` left quote character, the character to the left of the number [1] and above [Tab] on most keyboards.  This is inline code:  Inl∈ecodeblock  within a paragraph  For a separated code block use three ≤ftquotecharactersono≠l∈e,followedbythecodeblockonseparatel∈es.Terminatetheseparatecodeblockwithal∈eofthree  left quote characters.  `  Separated code block  `  The code in markdown cell code blocks do not execute when the markdown cell is run. A code block in a markdown cell is formatted when the markdown cell executes. Bold and Italics **Bold** and italic font is displayed by surrounding text with a double asterisk for \*\*bold\*\* and a single underscore for \_italics\_  \*\*bold\*\* produces **bold**  \_italics\_ produces italics  \*\*\_bold and italic\_\*\* produces bold and italic Tables Tables are displayed using the pipe | character, which is [Shift] + [\] on most keyboards. Columns are separated by pipes | and rows are separated by lines. After the header row, a row of pipes and dashes --- are needed to define the table.  | header1 | header 2 | header 3 |  | --- | --- | --- |  | col 1 | col 2 | col 3 |  | col 1 | col 2 | col 3 |  produces:   | header1 | header 2 | header 3 | | --- | --- | --- | | col 1 | col 2 | col 3 | | col 1 | col 2 | col 3 |  Bullet Points and Lists Bullet points are produced using the asterisk character \*  \* item 1  \* item 2  \* item 3  produces   * item 1 * item 2 * item 3   Numbered lists are produced using sequential numbers followed by a dot. Indent sub-items with two spaces.  1. First item  2. Second item  3. Third item  1. sub item  2. sub item  1. sub-sub item  2. sub-sub item  produces   1. First item 2. Second item 3. Third item 4. sub item 5. sub item    1. sub-sub item    2. sub-sub item  Horizontal Rule A horizontal rule is specified with three asterisks \*\*\* on a single line.  \*\*\*  produces Links Hyperlinks are specified using a set of square brackets [ ] followed by a pair of parenthesis ( ) The text inside the square brackets will be the link, the link address goes in the parenthesis.  [Python.org](https://python.org/)  produces  [Python.org](https://python.org) Images Images are embedded in Jupyter Notebook markdown using the exclamation point and square brackets ![ ], followed by the image file path in parenthesis ( ). If the image can not be displayed, the text in square brackets will be shown. The image can be in the same directory as the notebook, or a relative path can be specified. In this case, the image engineering.png is stored in the images directory, which is a subdirectory of the directory the notebook is saved in.  ![Engineering Image](images/engineering.png)  displays the image  Image displayed in a Jupyter notebook markdown cell  Python.org downloads page showing download for Windows button | | | | |