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UNIVERSITY  
*Shaping Lives...  
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School: ..... Campus: .....

Academic Year: ..... Subject Name: ..... Subject Code: .....

Semester: ..... Program: ..... Branch: ..... Specialization: .....

Date: .....

## **Applied and Action Learning** (Learning by Doing and Discovery)

**Name of the Experiment : SHA-256 in Action – Cryptographic Hashing**

### **Coding Phase : Pseudo Code/Flow Chart/Algorithm**

- Start
- ↓
- Input Message
- ↓
- Preprocess (Padding and Splitting into Blocks)
- ↓
- Initialize Hash Values
- ↓
- Process Each Block with SHA-256 Rounds
- ↓
- Combine Final Hash Values
- ↓
- Output 256-bit Hash
- ↓
- End

### **Apparatus/Software Used:**

- Online SHA-256 Tool
- Brave browser
- Internet Connection

## Testing Phase:

### Test case1:

Input :-hii...I am Pragnya Pralipta

Hase: 588dfbad6bcdcb75a6bd431dd216f688943a15b0ff683a5ff3211a5e6c15d80

### Test case 2:

Input : Hellow...I am Pragnya Pralipta

Hase : 099e9929306037759df60ab76d97762aab28f3a7d3871557631837200fb2d44

## Implementation Phase: Final Output (no error)

### Using Online Tool

- Open SHA-256 Tool: <https://emn178.github.io/online-tools/sha256.html>
- Type any message
- Output hash is shown immediately

### Test case 1:

The screenshot shows the SHA256 online tool interface. On the left, there is a 'Settings' sidebar with options for 'Hash' (selected), 'Auto Update' (on), 'Remember Input' (off), 'Input Encoding' (UTF-8), 'Output Encoding' (Hex (Lower Case)), and 'Enable HMAC' (off). The main area has an 'Input' field containing 'Hii... I am swadhwina' and an 'Output' field containing the hex hash '588dfbad6bcdcb75a6bd431dd216f688943a15b0ff683a5ff3211a5e6c15d80'. There are also download and copy icons for the output.

### Test case 2:

The screenshot shows the SHA256 online tool interface. On the left, there is a 'Settings' sidebar with options for 'Hash' (selected), 'Auto Update' (on), 'Remember Input' (off), 'Input Encoding' (UTF-8), 'Output Encoding' (Hex (Lower Case)), and 'Enable HMAC' (off). The main area has an 'Input' field containing 'Hellow...I am swadhwina' and an 'Output' field containing the hex hash '099e9929306037759df60ab76d97762aab28f3a7d3871557631837200fb2d44'. There are also download and copy icons for the output.

## Observations

- Each input text produces a unique 256-bit hash value.
- Even a single character change in the input causes a completely different hash.
- Identical inputs always generate the same hash value.
- The hashing process is one-way — original data cannot be retrieved from the hash.

## ASSESSMENT

Rubrics	Full Mark	Marks Obtained	Remarks
Concept	10		
Planning and Execution/ Practical Simulation/ Programming	10		
Result and Interpretation	10		
Record of Applied and Action Learning	10		
Viva	10		
<b>Total</b>	<b>50</b>		

**Signature of the Student:**

Name :

Regn. No. :

Page No.....

**Signature of the Faculty:**

\* As applicable according to the experiment.  
Two sheets per experiment (10-20) to be used.

