RJS POLYTECHNIC
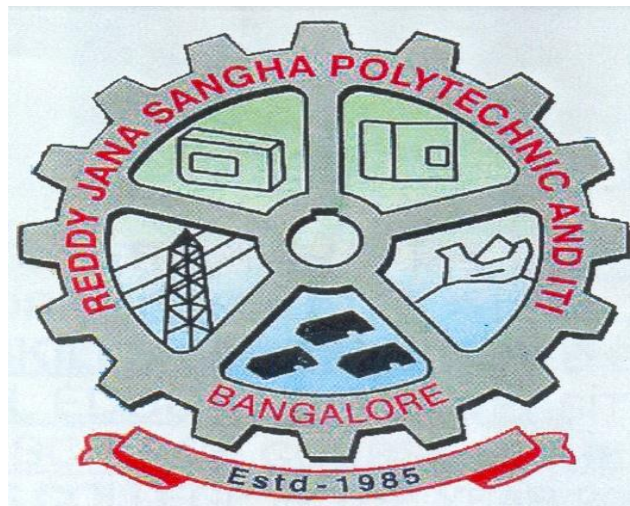
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IT SKILLS LAB MANUAL – 20CS01P

(Common to All Engineering Branches)

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Exercise 1
Write an algorithm for programmable problems Example for Reference:
- **Add/subtract two numbers**
- **Find the largest/smallest of 3 numbers**
- **Calculate and print sum of 'N' numbers**

Algorithm:
An algorithm is a set of computation steps performed to obtain the solution for a given problem.

OR

A procedure for solving a mathematical problem (as of finding the greatest common divisor) in a finite number of steps that frequently involves repetition of an operation.

OR

A step-by-step procedure for solving a problem or accomplishing some end.

a) Add / subtract two numbers

Step 1: Start
Step 2: Declare variables num1, num2 and sum.
Step 3: Read values num1 and num2.
Step 4: Add num1 and num2 and assign the result to sum.
    Sum←num1+num2
Step 5: Display sum.
Step 6: Stop

b) Find the largest / smallest of 3 numbers

Step 1: Start
Step 2: Input a, b, c
Step 3: if a > b goto step 4, otherwise goto step 5
Step 4: if a > c goto step 6, otherwise goto step 8
Step 5: if b > c goto step 7, otherwise goto step 8
Step 6: Output "a is the largest", goto step 9
Step 7: Output "b is the largest", goto step 9
Step 8: Output " c is the largest", goto step 9
Step 9: Stop

Algorithm to Calculate and print sum of 'N' numbers

Step 1: Start
Step 2: Assign sum=0 and i=0
Step 3: Read limit of number, n
Step 4: Repeat steps 5 to 6 until i=n reached
Step 5: Compute i=i+1
Step 6: Print sum
Step 7: Stop

Exercise 2

Design a flowchart for programmable problems Example for Reference:

- **Add/subtract two numbers**

- **Find the largest/smallest of 3 numbers**

- **Calculate and print sum of 'N' numbers**

Flowchart:

       A flowchart is a graphical representation of steps. It was originated from computer science as a tool for representing algorithms and programming logic but had extended to use in all other kinds of processes.

Benefits:

1. It helps to clarify complex processes.

2. It helps team members gain a shared understanding of the process and use this knowledge to collect data, identify problems, focus discussions, and identify resources.

3. It serves as a basis for designing new processes.

Flowchart Symbols

Symbol	Name	Function / Description
	Terminator	The terminator symbol represents the starting or ending point of the system.
	Process	A rectangle represents a process
	Document	This represents a printout, such as a document or a report.
	Decision	A diamond represents a decision or branching point. Lines coming out from the diamond indicates different possible situations, leading to different sub-processes.

	Data **OR** Input / Output	It represents information entering or leaving the system.
	On-Page Reference	This symbol would contain a letter inside. It indicates that the flow continues on a matching symbol containing the same letter somewhere else on the same page.
	Off-Page Reference	This symbol would contain a letter inside. It indicates that the flow continues on a matching symbol containing the same letter somewhere else on a different page.
	Flow / Arrow	Lines represent the flow of the sequence and direction of a process.

a) ADD / SUBTRACT TWO NUMBERS

b) FIND THE LARGEST / SMALLEST OF 3 NUMBERS

```
                        ┌──────────┐
                        │  Start   │
                        └────┬─────┘
                             │
                             ▼
                       ╱─────────────╲
                      │  Read A, B, C │
                       ╲─────────────╱
                             │
                             ▼
                          ◇ is A > B ◇
             Yes ◄────────────────────────► No
              │                              │
              ▼                              ▼
          ◇ Is A > C ◇                   ◇ is B > C ◇
     Yes ◄───────► No          No ◄───────────► Yes
      │             │           │               │
      ▼             ▼           ▼               ▼
  ╱───────╲     ╱───────╲               ╱────────╲
 │ Print A │   │ Print B │             │ Print C  │
  ╲───────╱     ╲───┬───╱               ╲────────╱
                    │
                    ▼
                ┌────────┐
                │  Stop  │
                └────────┘
```
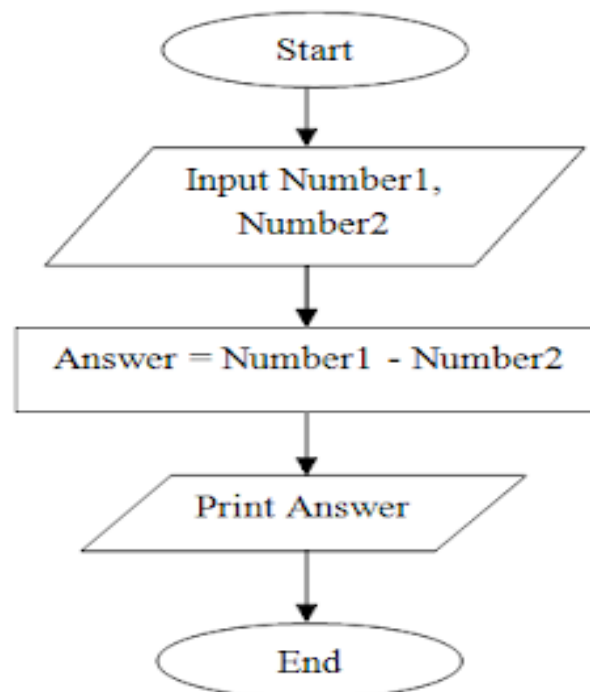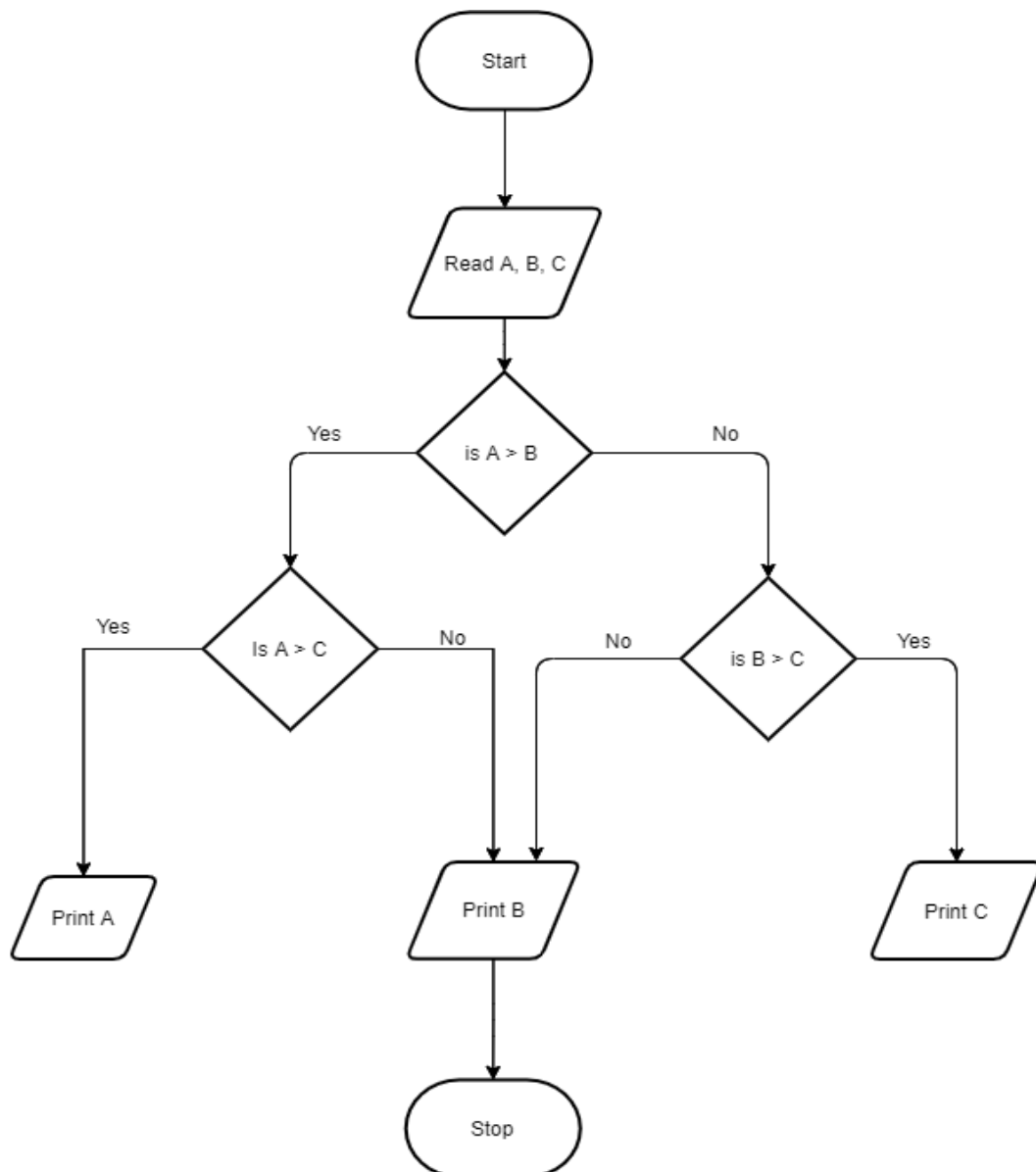
c) FLOWCHART TO FIND SUM OF FIRST N NUMBERS

```
                    ┌──────────┐
                    │  Start   │
                    └──────────┘
                         │
                         ▼
                 ┌──────────────┐
                 │ Assign sum=0 │
                 │  and i=0     │
                 └──────────────┘
                         │
                         ▼
                 ┌──────────────┐
                 │ Read limit of│
                 │  number n    │
                 └──────────────┘
                         │
                         ▼
                      ◇ i=n        Yes
                        reached ◇ ──────┐
                         │              │
                        No              │
                         ▼              │
                 ┌──────────────┐       │
                 │ sum=sum+i    │       │
                 │  i=i+1       │       │
                 └──────────────┘       ▼
                                  ┌──────────┐
                                  │ print sum│
                                  └──────────┘
                         │
                         ▼
                    ┌──────────┐
                    │   Stop   │
                    └──────────┘
```
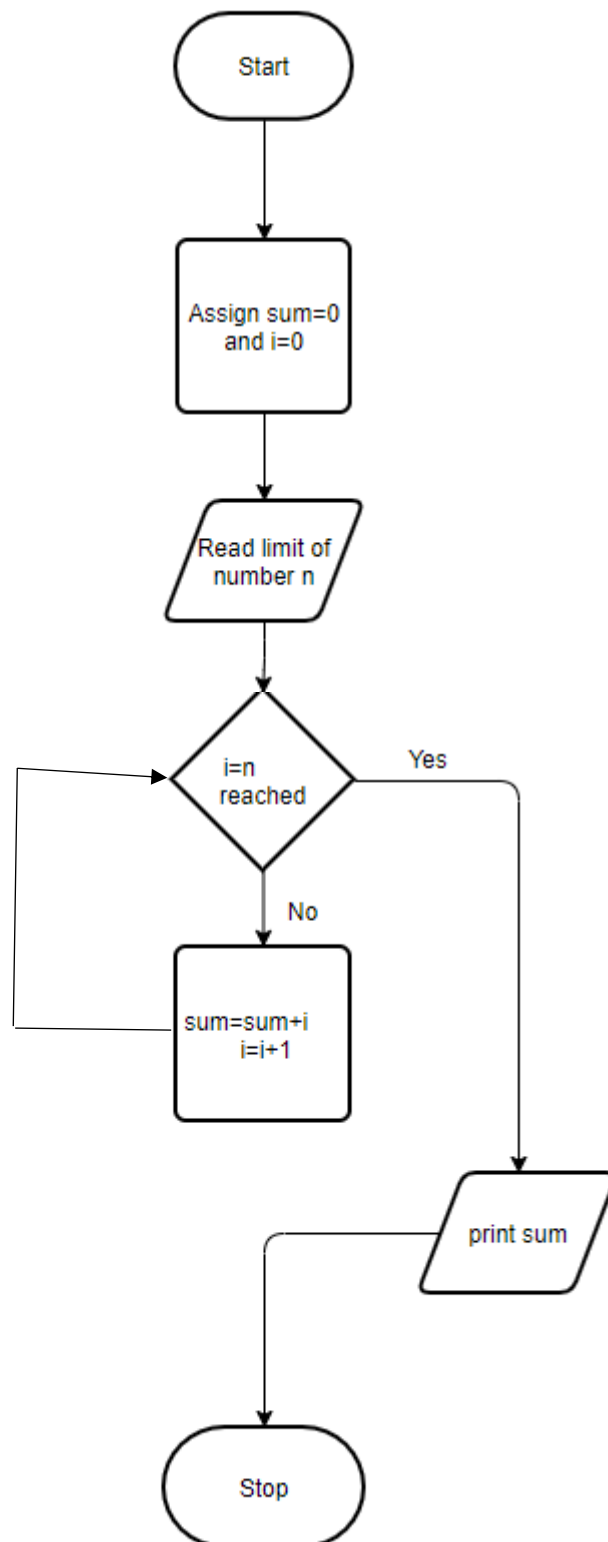
Exercise 3
Design and create simple game using MIT-scratch / Code.org
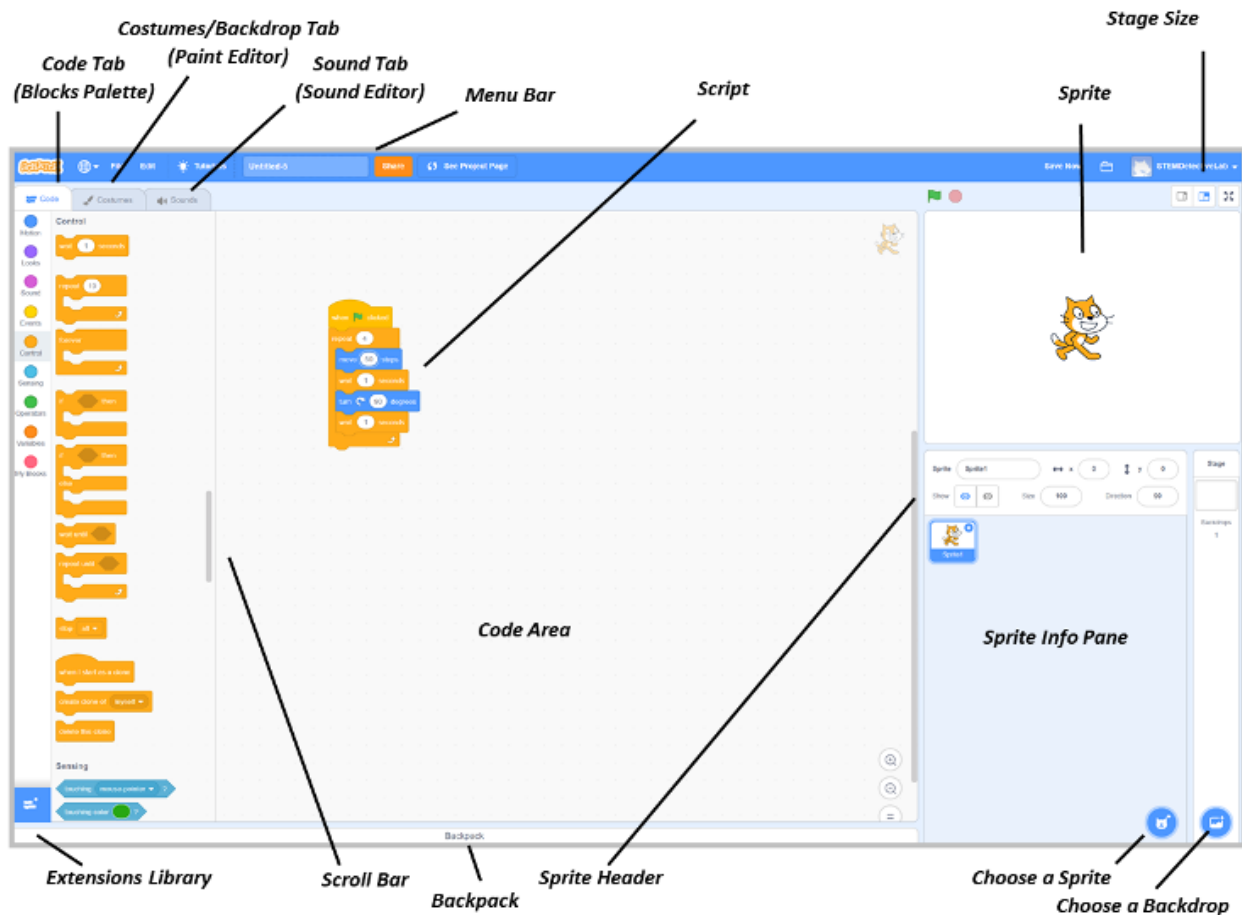

Fig: User Interface Layout

Menu Bar: It gives easy access to commands that you will use while creating your projects.

Stage Size: It allows you to toggle between three stage sizes: Small stage layout, Regular, and Full screen.

The Stage: It is the background of your project. It can have scripts, backdrops and sounds like a sprite, but with a few restrictions.

Sprite: A Sprite is an object in your project controlled by your scripts.

Sprite Info Pane: It is where you will find a thumb nail for each sprite in your project.

Choose a Backdrop: It is marked with a symbol of a background image, and its located to the right of the choose sprite button.

Code Area: It is where you will build your scripts.
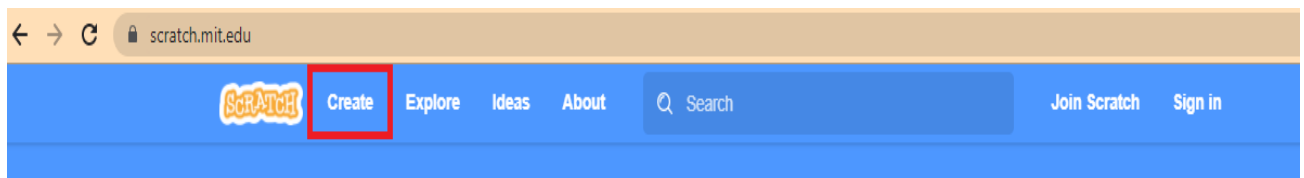
Below show the categories of programming blocks
1. Motion

2. Looks

3. Sound

4. Events

5. Control

6. Sensing

7. Operators

8. Variables

9. My Blocks

Motion

Looks

Sound

Events

Control

Sensing

Operators

Variables

My Blocks
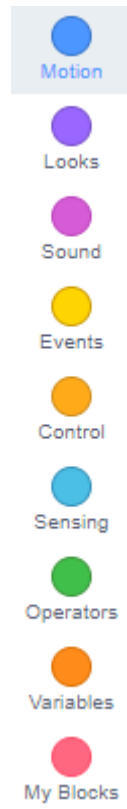
Step 1: Go to **https://Scratch.mit.edu** website and click on create

Step 2: Using the Programming Blocks create a story like a project and present it.

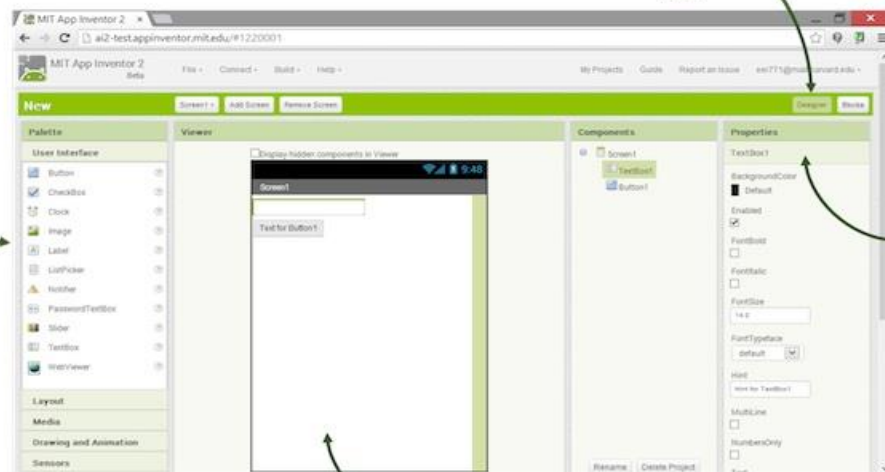Step 3: Code for this project is as follows

Exercise 4
Design and create simple android application (MIT App Inventor)

The Designer view gives you a visual representation of the application you are building.
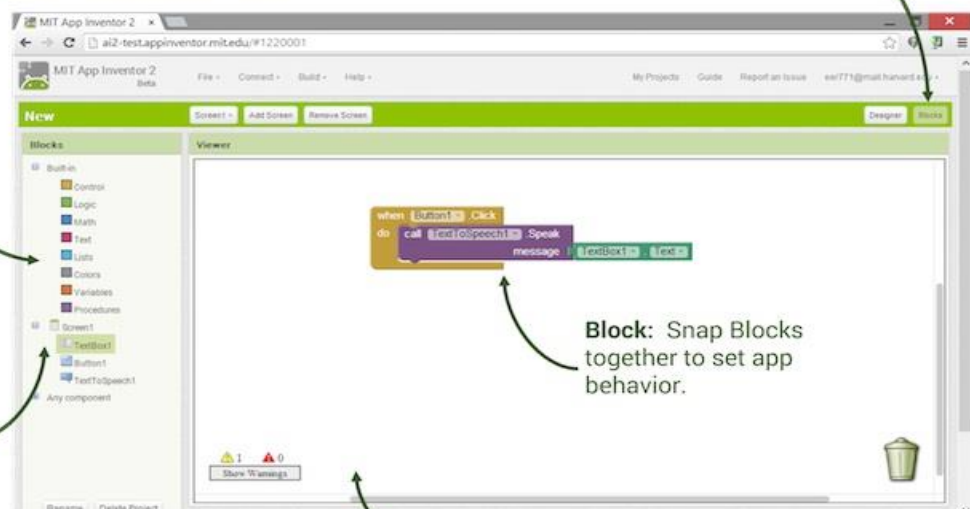

Fig: The Designer view of the AI2 platform

The Blocks view provides a space for building the application logic using various logic components called Blocks.

Fig: The Blocks view of the AI2 platform

To start developing our app we need to open App Inventor and create a new project.

1. Go to the App Inventor website:

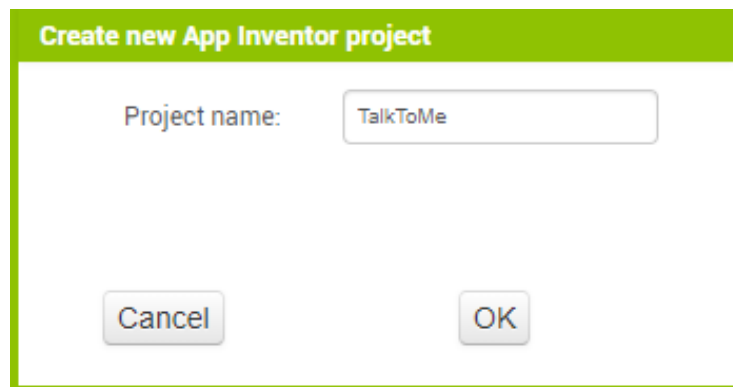   **http://appinventor.mit.edu/explore/**

2. Now login with your Gmail account in another tab (new tab)

3. Click on Create Apps in the top right corner of the page:

4. Start a new project

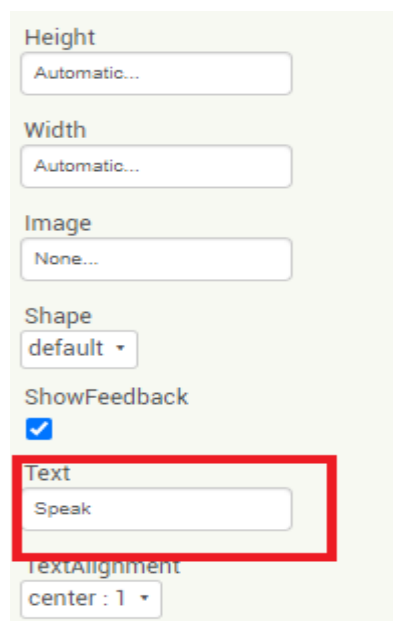5. Name the project as shown below

    Type as "TalkToMe", Remember no spaces. But underscores are OK.

6. Drag and drop the **Text Box** from the user interface (left side of the panel) on the canvas.

7. Drag and drop **Button** from the user interface and rename it as "speak"

8. Drag and drop **Text To Speech** from the Layout.

9. Drag and drop **AccelerometerSensor** from the Sensors.

Check once the below components are there in your project.
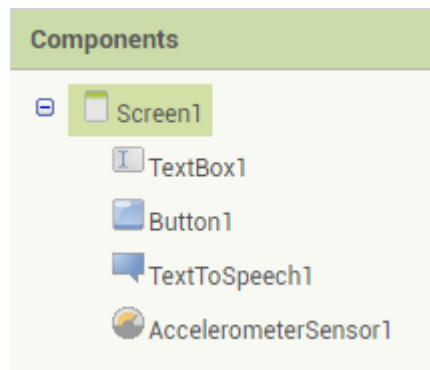
10. That's it, Now go to **Blocks** Editor (Which is in top right side of the window)

11. Design the code as shown in below.
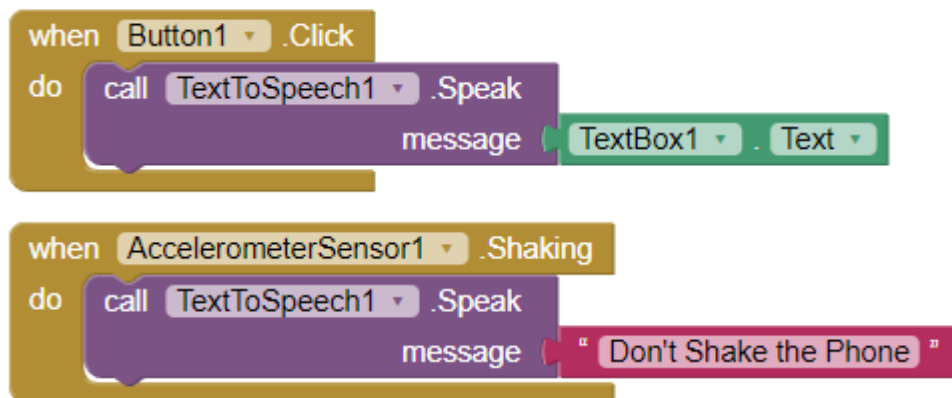
12. Now test your project from your android phone

13. Install **MIT AI2 Companion** from Google Play store.

MIT AI2 Companion

MIT Center for Mobile Learning   **Education**

E Everyone

i This app is available for all of your devices
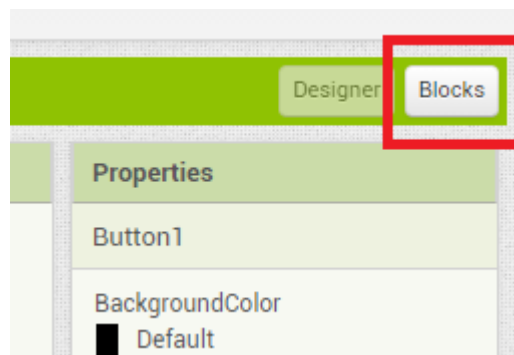
🔖 Add to wishlist

14. Now click on **Connect** from menu and click the **AI Companion**
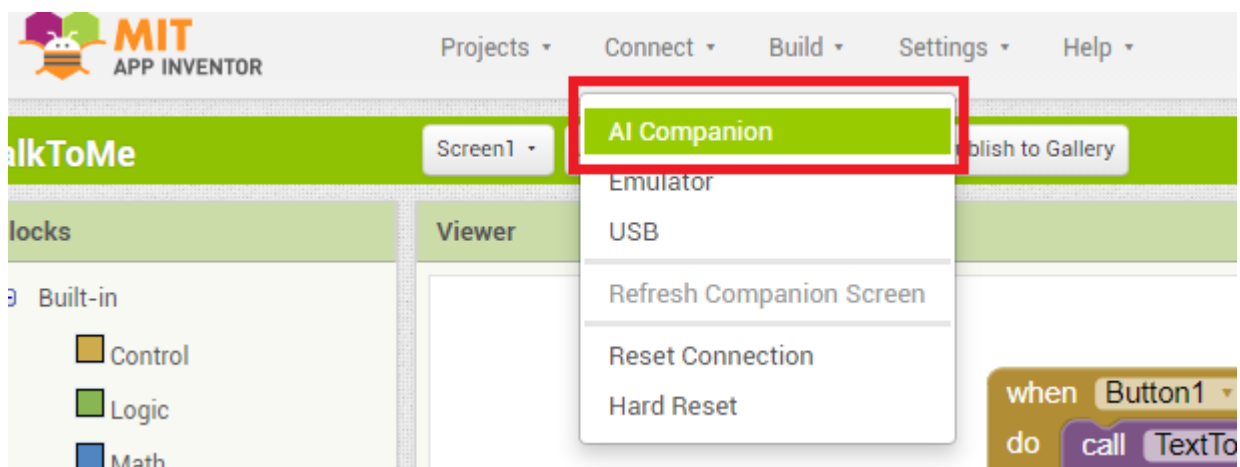
15. It will generate a QR Code and a unique code as shown in below.

Connect to Companion

Launch the MIT AI2 Companion on your device
and then scan the barcode or type in the code
to connect for live testing of your app.
Need help finding the Companion App?

Your code is:

puuumk

Cancel
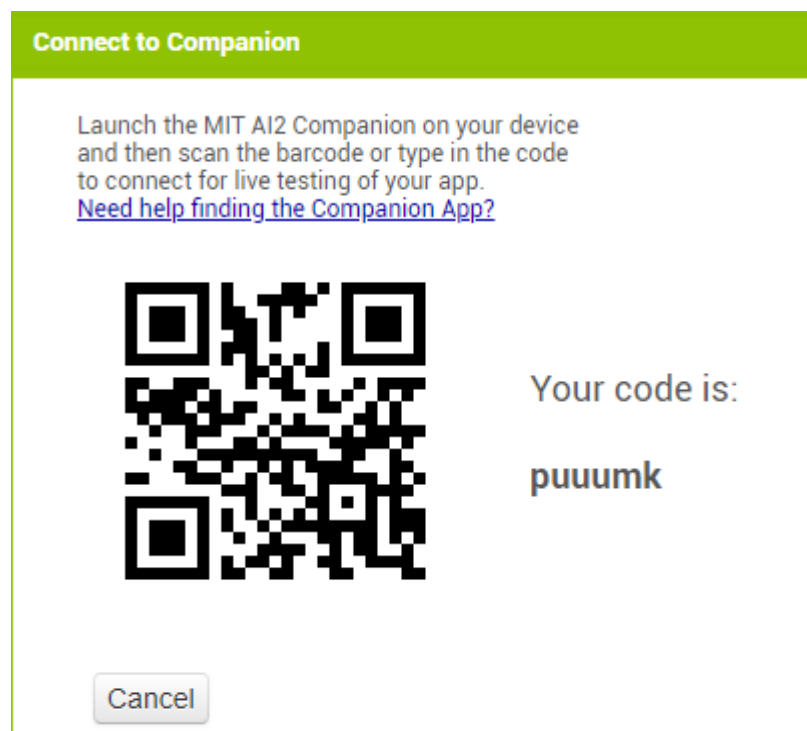
16. Open **MIT AI2 Companion** app in your phone and scan the QR Code or enter the 6-digit code to test the project.

OUTPUT

Exercise 5

Design and create webpage for displaying your poem (Title, header, paragraph, formatting tags)

```
<html>
<head>
<title> Poem </title>
</head>
<body bgcolor="Cyan">
<center>
        <font color="Blue">
                <h1>Twinkle Twinkle Little Star</h1>
        </font>
        <font color="Red">
                <h2>By Jane Taylor</h2>
        </font>
<p align="center">
<b>     Twinkle, twinkle, little star,</b><br>
        How I wonder what you are!<br>
        Up above the world so high,<br>
        Like a diamond in the sky!</p>

<p><i>          When the blazing sun is gone, </i><br>
                When he nothing shines upon,<br>
                Then you show your little light,<br>
                <b>Twinkle, twinkle, all the night.</b></p>

<p>     Then the traveller in the dark,<br>
        Thanks you for your tiny spark,<br>
        How could he see where to go,<br>
        If you did not twinkle so?</p>

<p>     In the dark blue sky you keep,<br>
        Often through my curtains peep<br>
        For you never shut your eye,<br>
        Till the sun is in the sky.</p>

<p>     As your bright and tiny spark<br>
        Lights the traveller in the dark,<br>
        Though I know not what you are,<br>
        <b>Twinkle, twinkle, little star. </b></p>
<strong><u><b> "Source: The Golden Book of Poetry (1947)" </b></u></strong>
</body>
</html>
```

OUTPUT

Twinkle Twinkle Little Star

By Jane Taylor

Twinkle, twinkle, little star,
How I wonder what you are!
Up above the world so high,
Like a diamond in the sky!

When the blazing sun is gone,
When he nothing shines upon,
Then you show your little light,
Twinkle, twinkle, all the night.

Then the traveller in the dark,
Thanks you for your tiny spark,
How could he see where to go,
If you did not twinkle so?

In the dark blue sky you keep,
Often through my curtains peep
For you never shut your eye,
Till the sun is in the sky.

As your bright and tiny spark
Lights the traveller in the dark,
Though I know not what you are,
**Twinkle, twinkle, little star.**

**"Source: The Golden Book of Poetry (1947)"**

Exercise 6
Design and create webpage for your wish list (What you want to do). Also list challenges and opportunities along with images to present your dreams (List ordered and unordered, Image, table)

```
<html>
<head>
<title> Wish list </title>
</head>
<body>
<center><h1> DREAMS </h1>
<img src="Dreams.jpg" height="200" width="200"></center>
<ol type="1">
<li>Completing my diploma in civil engineering. </li>
<li>Completing my Bachelor degree in a good engineering college.</li>
<li>I want to work hard to score First class / Distinction.</li> </ol>
<center><h2> OPPORTUNITIES </h2>
<img src="Opportunities.jpg" height="200" width="200"></center>
<ul>
<li>Focus on what you can control and have a plan for the rest</li>
<li>Go beyond immediate tasks and think of the big picture</li>
<li>Do a periodic comparison of your annual goals with your to-do list</li></ul>
<center><h3> CHALLENGES </h3>
<img src="Challenges.png" height="200" width="400"></center>
<table border="1">
<tr>
<th>SL NO</th>
<th>CHALLENGE</th>
</tr>
<tr>
<td>1.</td>
<td>Putting your goals off until someday.</td>
</tr>
<tr>
<td>2.</td>
<td>Waiting to take action until you 'feel' ready.</td>
</tr>
<tr>
<td>3.</td>
<td>Viewing mistakes as failure.</td>
</tr>
<tr>
<td>4.</td>
<td>Not making your goal a priority.</td>
</tr>
</table>
</body>
</html>
```

OUTPUT
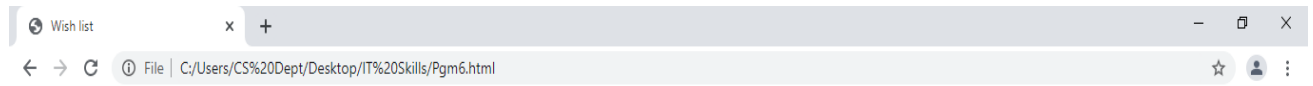
DREAMS
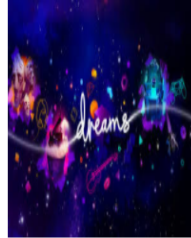
1. Completing my diploma in civil engineering.
2. Completing my Bachelor degree in a good engineering college.
3. I want to work hard to score First class / Distinction.

OPPORTUNITIES

- Focus on what you can control and have a plan for the rest
- Go beyond immediate tasks and think of the big picture
- Do a periodic comparison of your annual goals with your to-do list

CHALLENGES

SL NO	CHALLENGE
1.	Putting your goals off until someday.
2.	Waiting to take action until you 'feel' ready.
3.	Viewing mistakes as failure.
4.	Not making your goal a priority.

Exercise 7

Design and create webpage using HTML and CSS about an awesome animal (Use necessary CSS tags)

```
<html>
<head>
<title> Awesome Animal </title>
<style>
div img
{
margin:10px;
padding:10px;
border:10px solid red;
height:250px;
width:250px;
float:left;
}
</style>
</head>
<body bgcolor="cyan">
<h1> <font color="Blue">Awesome Animal </font></h1>
<h2><font color="Green">Lion</font></h2>
<div class="img">
<img src="Lion.jpg">
</div>
</body>
</html>
```

OUTPUT

Exercise 8

Design and create web page for a travel book / recipe book with more than 3 pages, table to list places/recipes (iframe, hyperlink)

Here we implemented 4 web pages for recipe book, so we should create 4 web pages namely

1. Recipe.html (Homepage)

2. Rice.html (Recipe 1)

3. Chapati.html (Recipe 2)

4. Tips.html (Cooking Tips)

<iframe> tag specifies an inline frame. An inline frame is used to embed another document within the current HTML document.

<hyperlink> The HTML <a> tag defines a hyperlink. You can click on a link and jump to another document.

Recipe.html (Homepage)

<html>
<head>
<title>Recipe Book</title>
</head>
<body>
<marquee>
<u>Welcome</u></marquee>
<center><h1> The Joy of Cooking </h1></center>
<img src="joy of cooking.jpg" height="300" width="500">
<h2> Contents: </h2>
<table border="1">
<tr>
<th>SL NO</th>
<th>RECIPE NAME</th>
<th>SERVING TIME</th>
</tr>
<tr>
<td>1.</td>
<td>Rice and Sambar</td>
<td>Afternoon</td>
</tr>
<tr>
<td>2.</td>
<td>Chapati</td>
<td>Night</td>
</tr>
</table>
<h3> <center> General Cooking Tips is shown below </center></h3>
<center><iframe src="tips.html" height="75%" width="75%">Recipe</iframe></center>
<h3>If you want to know about Recipe #1 & #2, click on below link</h3>

```
<a href="Rice.html">Recipe #1</a> <br> <br>
<a href="chapathi.html">Recipe #2</a>
</body>
</html>
```

OUTPUT

Rice.html (Recipe 1)

```
<html>
<head>
<title>Rice and Sambar</title>
<body bgcolor="green">
<marquee><b><u>The Joy of Cooking</u></b></marquee>
<h1>Rice and Sambar</h1>
<img src="sambar.jpg" height="200" width="200">
<h2>How to make sambar</h2>
<ol>
<li>Before we begin making sambar, it always helps to soak tamarind in water earlier.<br>
So soak 1 tablespoon tamarind in 1 by 3 cup hot water for 20 to 30 minutes.</li><br>
<li>Once the tamarind gets soft, then squeeze the tamarind in the water itself. <br>
Discard the strained tamarind and keep the tamarind pulp aside.</li><br>
<li>Rinse half cup toor dal (100 grams) a couple of times in water.</li><br>
<li>Drain all the water and add the dal in a 2 litre pressure cooker. Also add ¼ teaspoon turmeric
powder.</li><br>
<li>Add 1.5 to 1.75 cups of water and mix.</li><br>
<li>Cover and pressure cook dal for 7 to 8 whistles or 10 to 12 minutes on medium
flame.</li><br>
<li>When the pressure settles down on its own, open the lid and check the dal.<br>
```
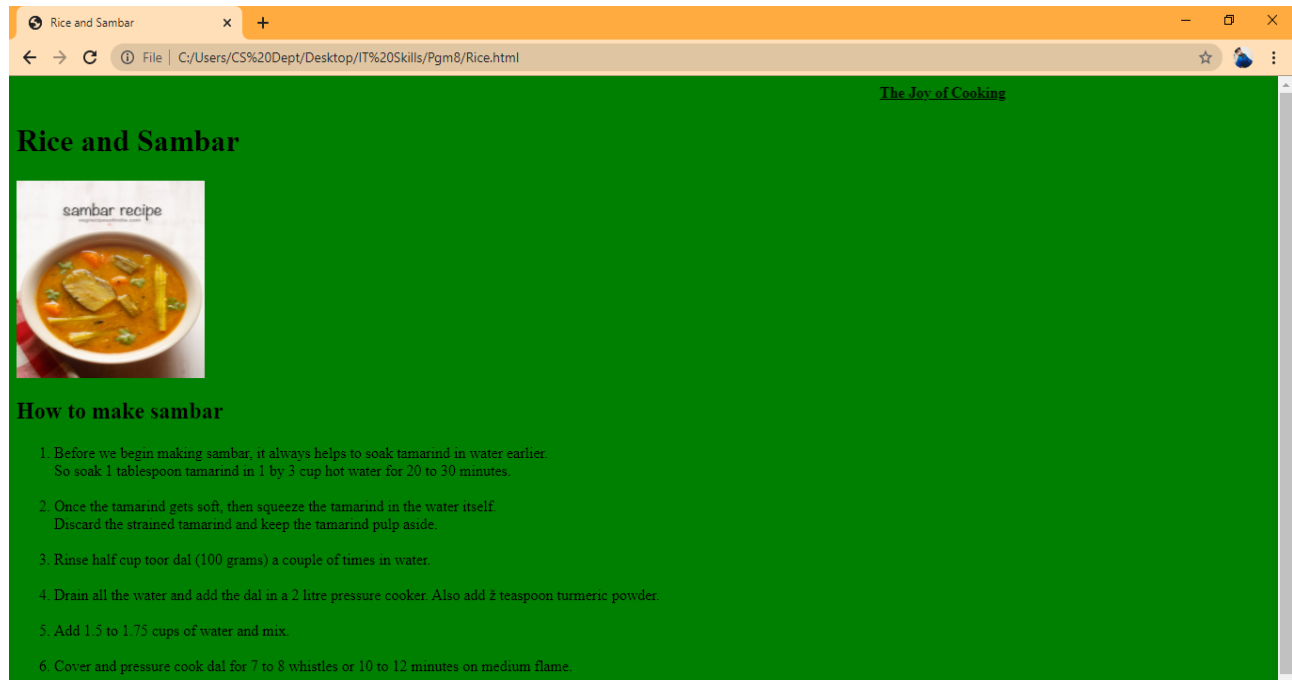
The dal should be completely cooked and mushy. mash the dal with a spoon or wired
whisk.
</body>
</html>

OUTPUT

Chapati.html (Recipe 2)

```
<html>
<head>
<title>Chapati</title>
<body bgcolor="cyan">
<marquee><b><u>The Joy of Cooking</u></b></marquee>
<h1>Chapathi</h1>
<img src="chapati.jpg" height="200" width="200">
<h2>How to make chapati</h2>
<ol>
<li>Pour the wheat flour, salt, and ghee into a bowl and mix the ingredients together.</li><br>
<li>Add half a cup of water to the flour mixture and stir the mixture until it's soft and
supple.</li><br>
<li>Add the remaining water slowly, stirring until it's fully combined.</li><br>
<li>Place the dough into an oiled bowl and cover it for 25 minutes.</li><br>
<li>Divide the dough into 10-12 small balls, and dip them into flour.</li><br>
<li>Roll the dough with a rolling pin until the balls resemble thin, round pancakes.</li><br>
<li>Heat a heavy frying pan, tawa, or griddle over medium heat and cook each chapati on both
sides.</li><br>
<li>Remove the chapati from the heat, and wrap it in a towel until they are all ready to
serve.</li><br>
</body>
```
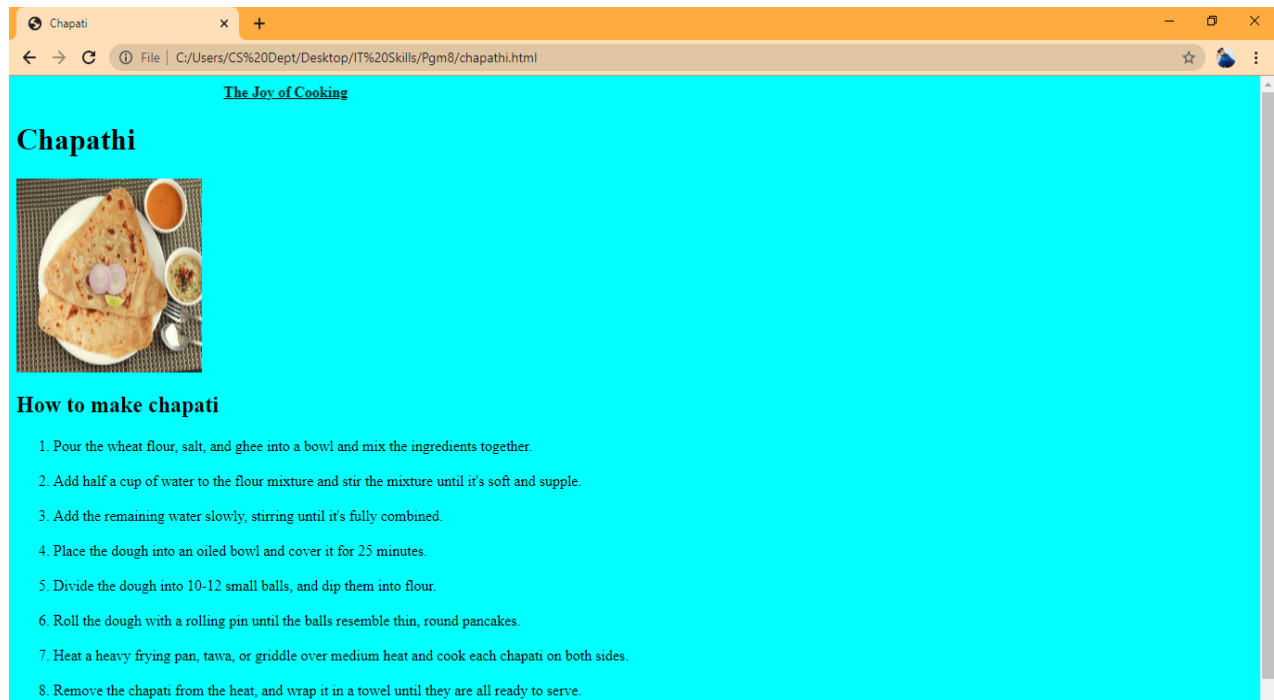
</html>

OUTPUT

Tips.html (Cooking Tips)

```
<html>
<head>
<title>cooking tips</title>
<body bgcolor="pink">
<marquee><b><u>The Joy of Cooking</u></b></marquee>
<h1>General Cooking Tips</h1>
<img src="cooking.jpg" height="200" width="200">
<ol>
<li>Take notes as you go.</li><br>
<li>Read the recipe all the way through before you start.</li><br>
<li>Put a damp paper towel under your cutting board.</li><br>
<li>Set your timer for a few minutes less than the called-for time.</li><br>
<li>Season and taste as you go.</li><br>
<li>Trust yourself!</li><br>
</body>
</html>
```

OUTPUT

General Cooking Tips is shown below

<div style="background-color:pink">

The Joy of Cooking

General Cooking Tips

1. Take notes as you go.

2. Read the recipe all the way through before you start.

3. Put a damp paper towel under your cutting board.

4. Set your timer for a few minutes less than the called-for time.

5. Season and taste as you go.

</div>

If you want to know about Recipe #1 & #2, click on below link

Recipe #1

Recipe #2

Exercise 9

Design and create web page with JavaScript to design a simple calculator to perform the following operations: sum, product, difference and quotient

```html
<html>
<head>
<script>
      function dis(val)
      {
            document.getElementById("result").value+=val
      }
      function solve()
      {
            let x = document.getElementById("result").value
            let y = eval(x)
            document.getElementById("result").value = y
      }
      function clr()
      {
            document.getElementById("result").value = ""
      }
</script>
<style>
input
{
      width:100%;
      padding:20px;
      background-color:cyan;
}
</style>
</head>
<body>
<center><h1>MY CALCULATOR</h1>
<table border="1">
<tr>
<td colspan="3"><input type="text" id="result"/></td>
<td><input type="button" value="Clear" onclick="clr()"/> </td>
</tr>
<tr>
<!-- create button and assign value to each button -->
<!-- dis("1") will call function dis to display value -->
<td><input type="button" value="1" onclick="dis('1')"/> </td>
<td><input type="button" value="2" onclick="dis('2')"/> </td>
<td><input type="button" value="3" onclick="dis('3')"/> </td>
<td><input type="button" value="/" onclick="dis('/')"/> </td>
</tr>
<tr>
<td><input type="button" value="4" onclick="dis('4')"/> </td>
<td><input type="button" value="5" onclick="dis('5')"/> </td>
```

```
<td><input type="button" value="6" onclick="dis('6')"/> </td>
<td><input type="button" value="-" onclick="dis('-')"/> </td>
</tr>
<tr>
<td><input type="button" value="7" onclick="dis('7')"/> </td>
<td><input type="button" value="8" onclick="dis('8')"/> </td>
<td><input type="button" value="9" onclick="dis('9')"/> </td>
<td><input type="button" value="+" onclick="dis('+')"/> </td>
</tr>
<tr>
<td><input type="button" value="." onclick="dis('.')"/> </td>
<td><input type="button" value="0" onclick="dis('0')"/> </td>
<!-- solve function call function solve to evaluate value -->
<td><input type="button" value="=" onclick="solve()"/> </td>
<td><input type="button" value="*" onclick="dis('*')"/> </td>
</tr>
</table>
</center>
</body>
</html>
```

OUTPUT

MY CALCULATOR

Exercise 10
Design and create a personal webpage with dashboard

```
<html>
<head>
<title>MY DASHBOARD</title>
</head>
<body>
<p align="center"><u>MY FINANCIAL DASHBOARD FOR FEBRUARY 2021</h1></u></p>
<u><h1>1. INCOME</h1></u>
<p align="center">
<img src="income.jpg" height="300" width="500">
</p>
<u><h1>2. EXPENSES</h1></u>
<p align="center">
<img src="Expenses.jpg" height="300" width="500">
</p>
<u><h1>3. ACCOUNTS PAYABLE</h1></u>
<p align="center">
<img src="accounts payable.jpg" height="300" width="500">
</p>
<u><h1>4. ACCOUNTS RECEIVABLE</h1></u>
<p align="center">
<img src="ACCOUNTS RECEIVABLE.jpg" height="300" width="500">
</p>
</body>
</html>
```

OUTPUT

Exercise 11
Design and create web page about advantages of business process automation with respect to your branch of engineering

```
<html>
<head>
<title>BUSINESS PROCESS AUTOMATION</title>
</head>
<body>
<p align="center">
<font size="20"><u>ADVANTAGES OF BPA IN CIVIL ENGG.</h1></u></font></p>
<font face="calibri">
<u><h1>Why Automation is Important? </h1></u> <br>
```
Given the right tools, automating computer operations can be surprisingly easy and can reap major benefits. Understanding these benefits—and some obstacles—will help you develop support for an operations automation project. A recent study by a leading trade journal asked the question, "What do you see as the most important benefits of an automated or unattended computer center?" The primary benefits of operations automation cited most often were `<b>`cost reduction, productivity, availability, reliability, and performance.`</b><br>`
`<u><h1>`1. Reducing Operational Costs`</h1></u>` `<br>`
Given the right tools, automating computer operations can be surprisingly easy and can reap major benefits. Understanding these benefits—and some obstacles—will help you develop support for an operations automation project. A recent study by a leading trade journal asked the question, "What do you see as the most important benefits of an automated or unattended computer center?" The primary benefits of operations automation cited most often were `<b>`cost reduction, productivity, availability, reliability, and performance.`</b><br>`
`<u><h1>`2. Increasing Productivity`</h1></u>` `<br>`
As an organization's technology demands grow, productivity becomes a bigger concern. Typically, as other business areas were given tools to increase their productivity and effectiveness, IT operations took a back seat. The proliferation of desktop productivity software has created substantial gains in the office and HR environments.`<br>`
`<u><h1>`3. Ensuring High Availability`</h1></u>` `<br>`
Companies are continually more reliant on their computers. Day-to-day business is routinely conducted with online systems: order entry, reservations, assembly instructions, shipping orders—the list goes on. If the computer is not available, the business suffers.`<br>`
`<u><h1>`4. Increasing Reliability`</h1></u>` `<br>`
Productivity is an obvious benefit of automation. However, reliability is the real gem that sparkles with automation. It is the cornerstone of any good IT operations department and without it you have confusion, chaos, and unhappy users. `<br>`
`<u><h1>`5. Optimizing Performance`</h1></u>` `<br>`
Every company would like to have their enterprise perform like a thoroughbred. In reality, it is more likely to be overburdened with work. Even though advancements in computers make them faster and less expensive every year,`<br>`
```
</body>
</html>
```

OUTPUT

ADVANTAGES OF BPA IN CIVIL ENGG.

Why Automation is Important?

Given the right tools, automating computer operations can be surprisingly easy and can reap major benefits. Understanding these benefits—and some obstacles—will help you develop support for an operations automation project. A recent study by a leading trade journal asked the question, "What do you see as the most important benefits of an automated or unattended computer center?" The primary benefits of operations automation cited most often were **cost reduction, productivity, availability, reliability, and performance.**

1. Reducing Operational Costs

Given the right tools, automating computer operations can be surprisingly easy and can reap major benefits. Understanding these benefits—and some obstacles—will help you develop support for an operations automation project. A recent study by a leading trade journal asked the question, "What do you see as the most important benefits of an automated or unattended computer center?" The primary benefits of operations automation cited most often were **cost reduction, productivity, availability, reliability, and performance.**

2. Increasing Productivity

As an organization's technology demands grow, productivity becomes a bigger concern. Typically, as other business areas were given tools to increase their productivity and effectiveness, IT operations took a back seat. The proliferation of desktop productivity software has created substantial gains in the office and HR environments.

3. Ensuring High Availability

Companies are continually more reliant on their computers. Day-to-day business is routinely conducted with online systems: order entry, reservations, assembly instructions, shipping orders—the list goes on. If the computer is not available, the business suffers.

4. Increasing Reliability

Productivity is an obvious benefit of automation. However, reliability is the real gem that sparkles with automation. It is the cornerstone of any good IT operations department and without it you have confusion, chaos, and unhappy users.

5. Optimizing Performance

Every company would like to have their enterprise perform like a thoroughbred. In reality, it is more likely to be overburdened with work. Even though advancements in computers make them faster and less expensive every year,

Exercise 12

Create a workflow for education loan approval in bank / diploma admission process (Use any tool)

# Types of Messages in Sequence Diagrams

Synchronous Message

A synchronous message requires a response before the interaction can continue. It's usually drawn using a line with a solid arrowhead pointing from one object to another.

Asynchronous Message

Asynchronous messages don't need a reply for interaction to continue. Like synchronous messages, they are drawn with an arrow connecting two lifelines; however, the arrowhead is usually open and there's no return message depicted.
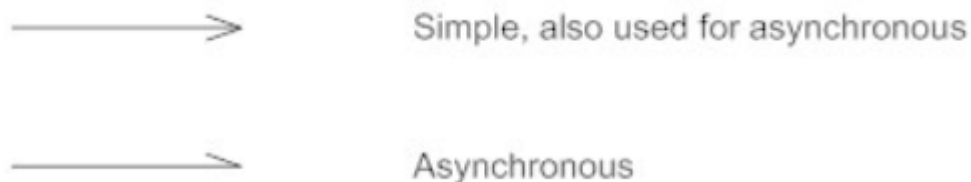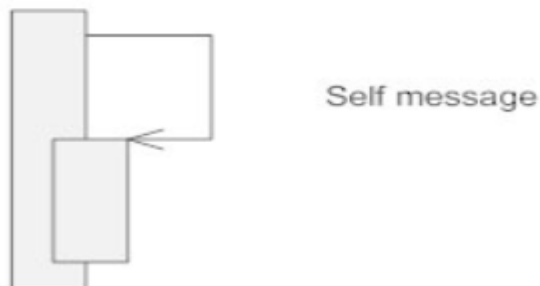
Reply or Return Message

A reply message is drawn with a dotted line and an open arrowhead pointing back to the original lifeline.
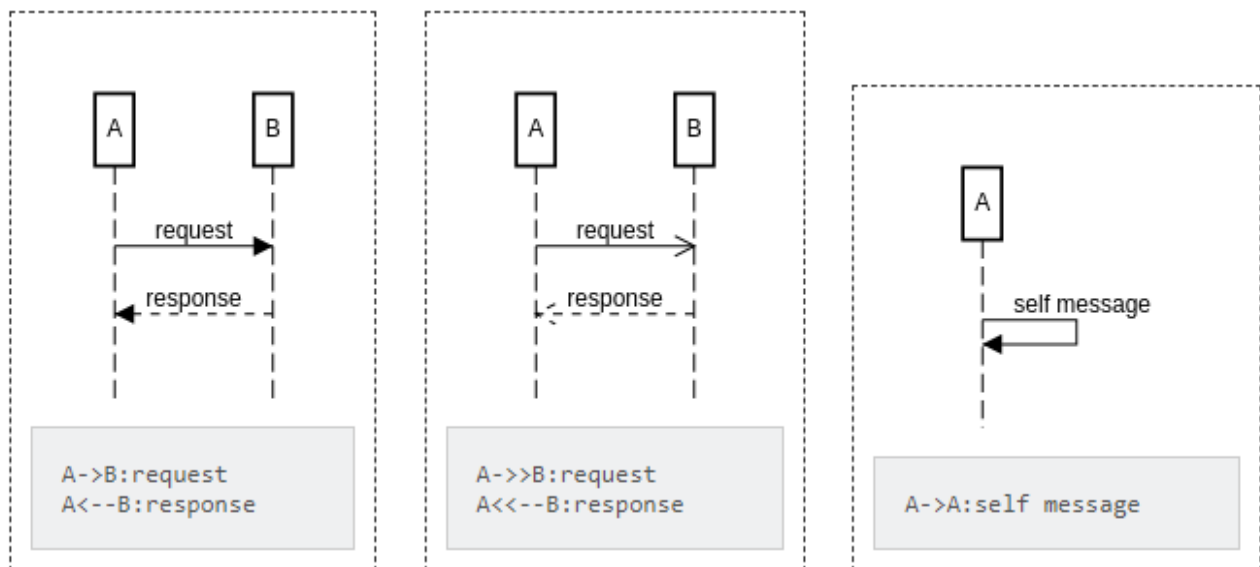
Self Message

A message an object sends to itself, usually shown as a U-Shaped arrow pointing back to itself.

Examples of Synchronous, Reply / Return Message and Self Message

Visit the below URL to create a sequence diagram for creating Diploma Admission Process:

https://sequencediagram.org/

Sequence

title DIPLOMA ADMISSION PROCESS
participant STUDENT
participant COLLEGE
participant DTE BOARD
STUDENT->COLLEGE: Applies for admission
STUDENT<<--COLLEGE: Check SSLC/PUC marks [Just pass or fail \n and Provide application]
STUDENT->COLLEGE: Fills in the details given in the application form \n and submits with the documents.
STUDENT<<--COLLEGE: Verifies the submitted documents
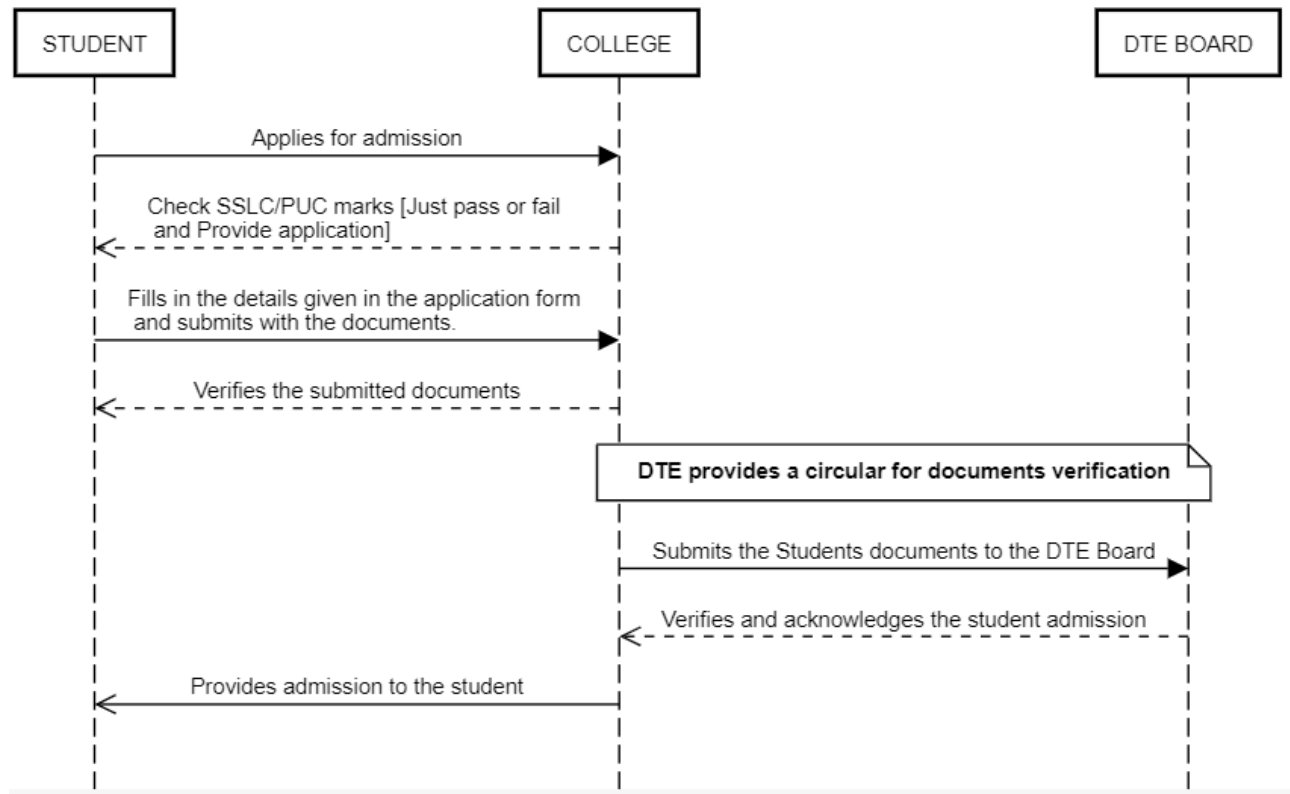note over COLLEGE,DTE BOARD:**DTE provides a circular for documents verification**
COLLEGE->DTE BOARD: Submits the Students documents to the DTE Board
COLLEGE <<-- DTE BOARD: Verifies and acknowledges the student admission
STUDENT <<- COLLEGE: Provides admission to the student

OUTPUT

DIPLOMA ADMISSION PROCESS

STUDENT	COLLEGE	DTE BOARD

Applies for admission

Check SSLC/PUC marks [Just pass or fail and Provide application]

Fills in the details given in the application form and submits with the documents.

Verifies the submitted documents

DTE provides a circular for documents verification

Submits the Students documents to the DTE Board

Verifies and acknowledges the student admission

Provides admission to the student

Exercise 13
Demonstrate ERP with ERPNext Demo for manufacturing, retail and service sector (Use any other ERP tools)
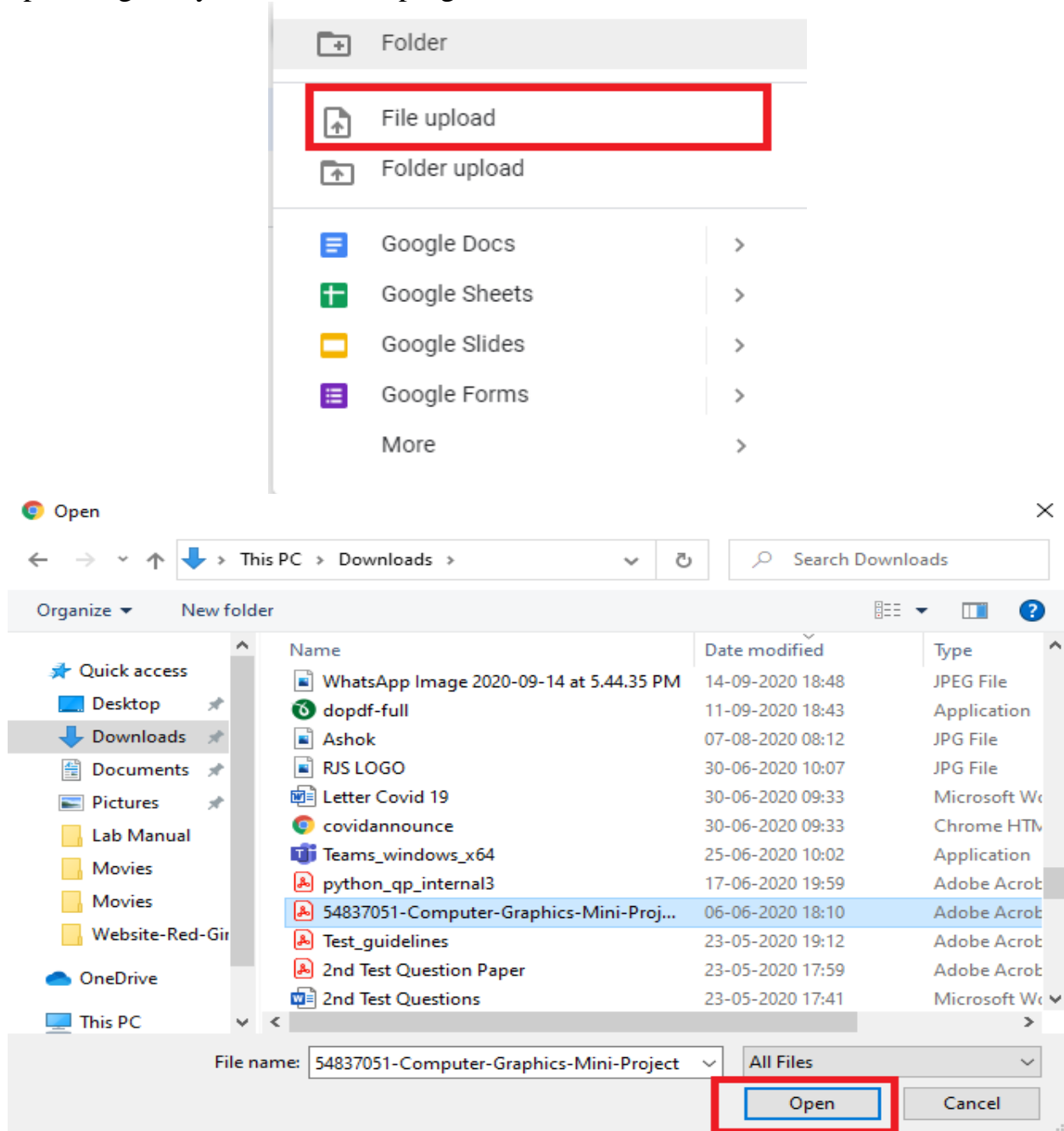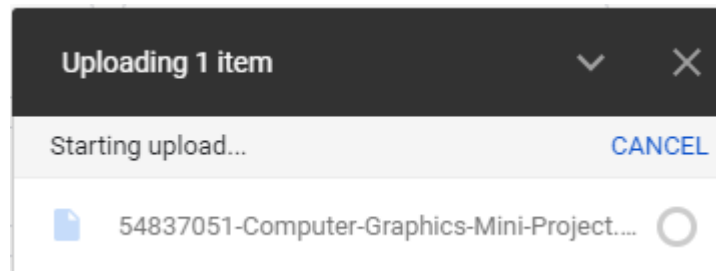
Exercise 14
Create user account and demonstrate use of Google drive, Google docs, Google Co-lab (Usage of Jupyter Notebook)

Demonstration of Google Drive, Google Docs (Docs, Excel and Slides (PPT))

Step 1: First sign-in to your google drive by entering your Gmail id and password
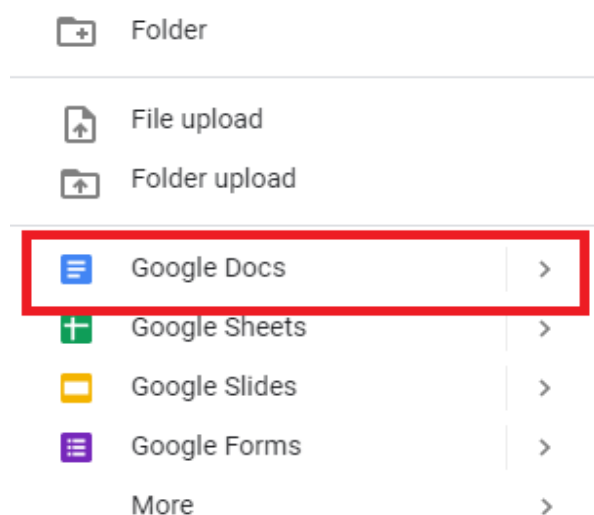
Step 2: For uploading files to your Google Drive click on NEW → File Upload → Select which files you want to upload and click open. Now the file will start uploading and you can see the progress of the file
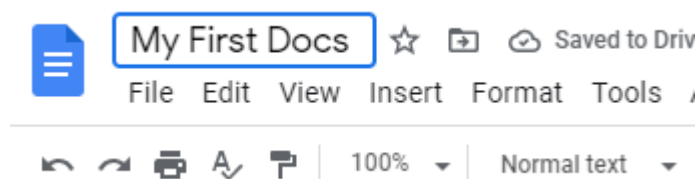
Google Docs (Docs, Excel and Slides(PPT))

Step 1: Go to Google Drive and Click on New → Google Docs → It will redirects to the google docs page.

Step 2: By default, Docs uses the naming convention Untitled Document. To rename, click on that name and type the desired name in the edit box as shown below.


Step 3: Type / Write any details as you want in the document and it will automatically save the document to your Google Drive

Similarly Create Google Sheets (Excel) and Google Slides (PPT) by following above steps

Demonstration of Google Co-lab (Usage of Jupyter Notebook)

As Colab implicitly uses Google Drive for storing your notebooks, ensure that you are logged in to your Google Drive account before proceeding further.

Step 1: Open the following URL in your browser https://colab.research.google.com Your browser would display the following screen
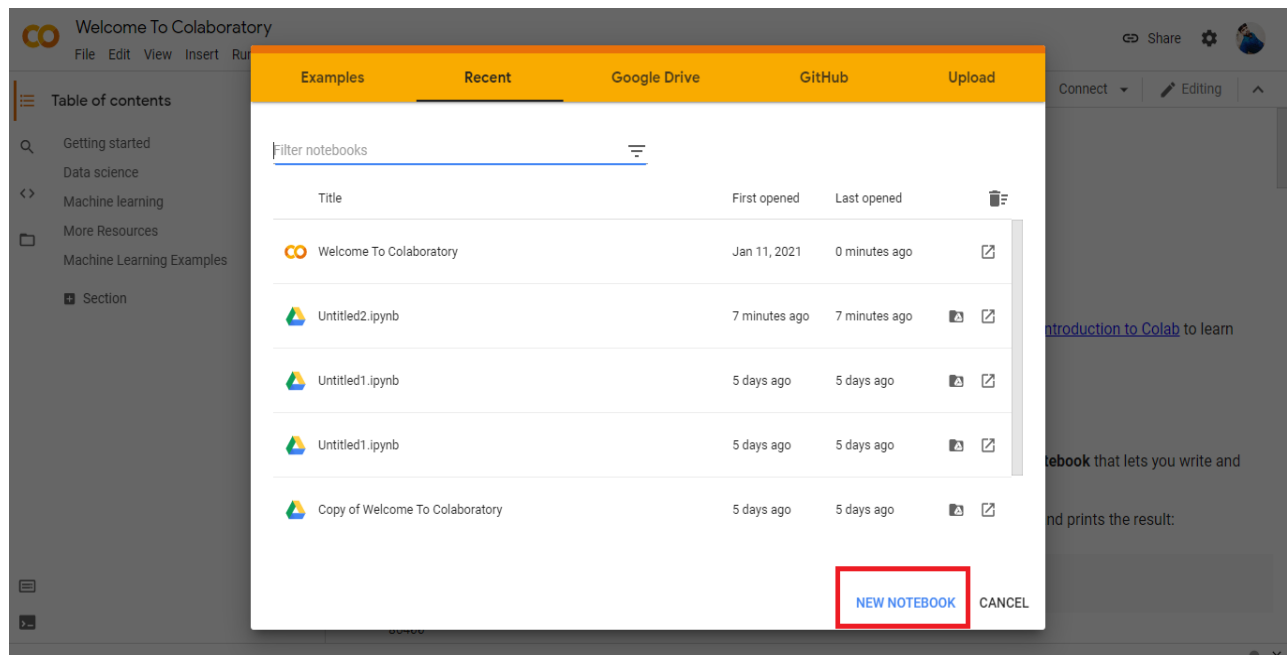
Step 2: Click on the NEW NOTEBOOK link at the bottom of the screen. A new notebook would open up as shown in the screen below.
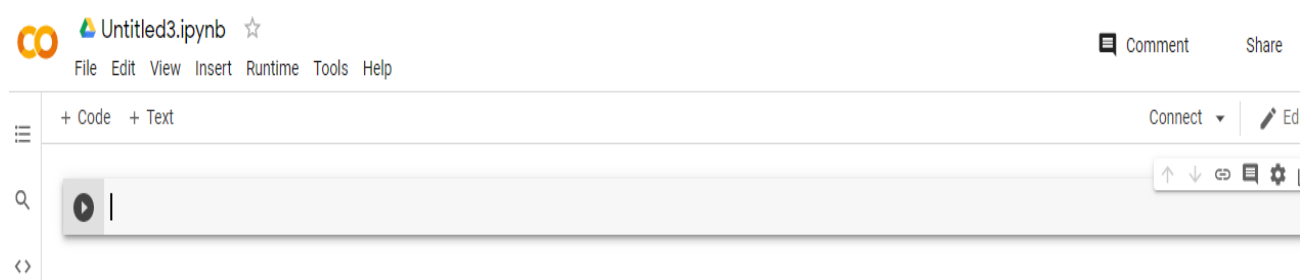
Step 3: By default, the notebook uses the naming convention UntitledXX.ipynb. To rename the notebook, click on this name and type in the desired name in the edit box as shown below.
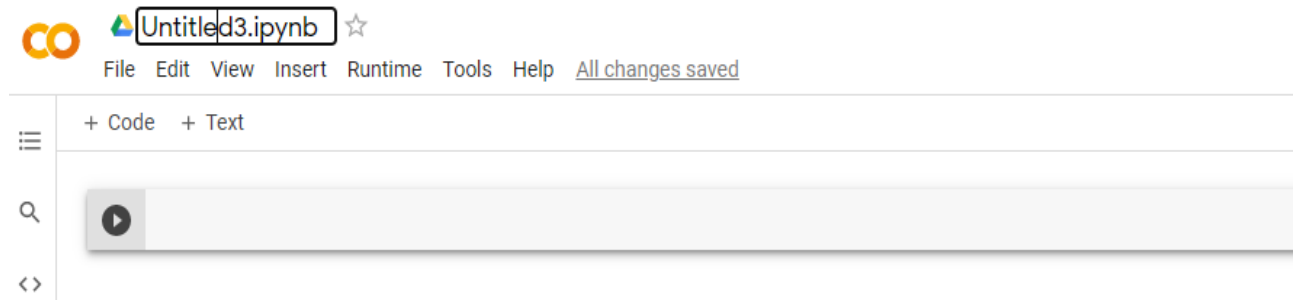
We call this notebook as MyFirstColab. So type this name in the edit box and hit ENTER.

Step 4: Entering Code: You will now enter a Python code in the code window and execute it.

Enter the following Python Statements in the code below:

```
a=5
b=10
c=a/b
print("The Result is:",c)
```

Step 5: Executing Code: To execute the code, click on the arrow on the left side of the code window or use the shortcut keys **Ctrl**+**Enter** OR **Shift**+**Enter**.
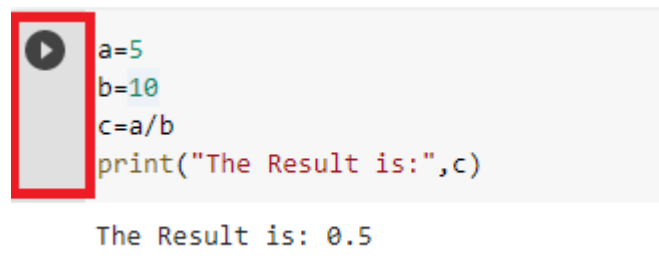
Step 6: Saving your Work: Colab allows you to save your work to Google Drive or even directly to your GitHub repository. To save your notebook, select the following menu options:

File / Save a Copy in Drive

The action will a create a copy of your notebook and save it to your drive. Later on you may rename the copy to your choice of name.
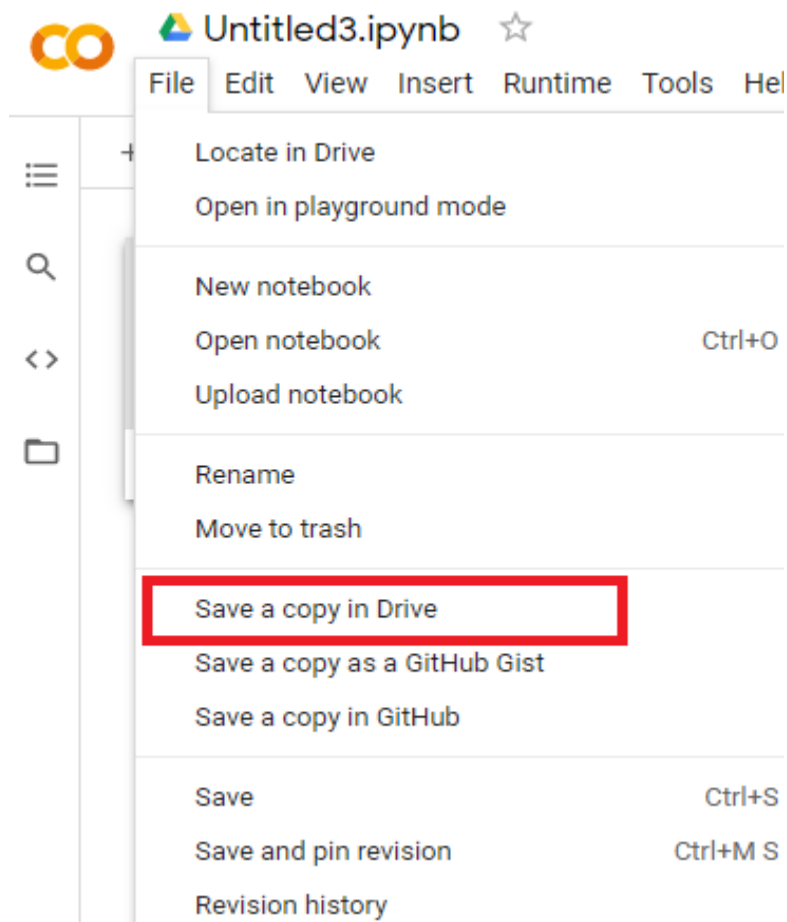
Exercise 15
Demonstrate Internet of Things using with examples
a. Smart home
b. Smart city
c. Smart farming

a. Smart Home

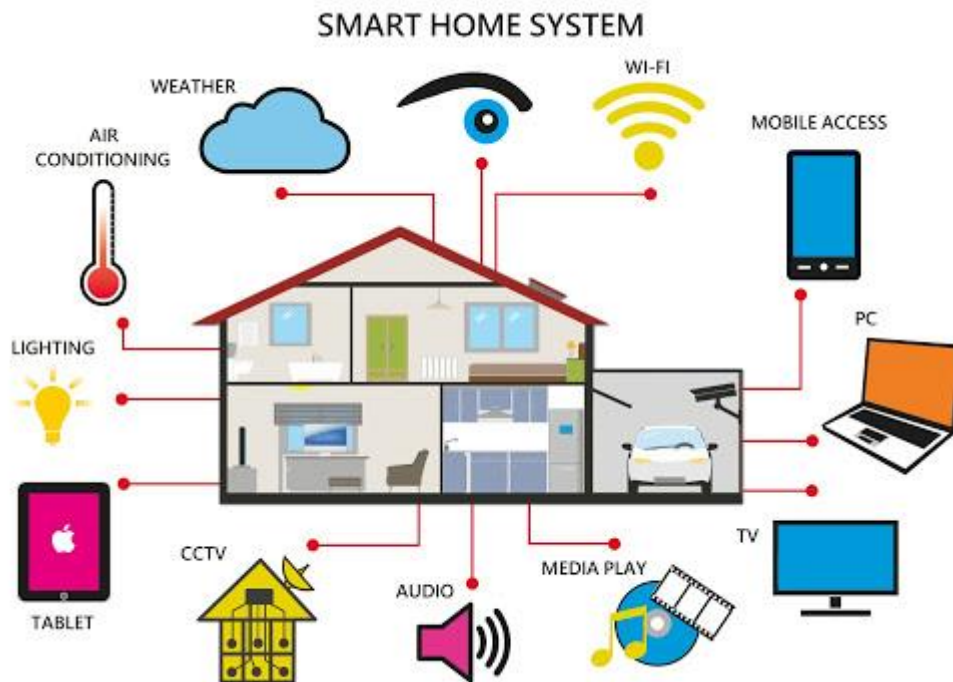We live in an exciting time where more and more everyday things are becoming smart. Appliances have sensors and can sensors and can communicate to other things and can provide control to more things. Homes of the 21st century will become more and more self-controlled and automated due to the comfort it provides, especially when employed in a private home. A home automation system is a means that allows users to control electric appliances of varying kind.

There are many types of IoT applications in smart home in general.

1.) Smart Lighting: Helps in saving energy by adapting the lighting to the ambient conditions and switching on / off or diming the light when needed.

2.) Smart Appliances: Make the management easier and also provide status information to the users remotely.

3.) Intrusion Detection: Use security cameras and sensors (PIR sensors and door sensors) to detect intrusion and raise alerts. Alerts can be in the form of SMS or E-Mail sent to the user.

4.) Smoke / Gas Detectors: Smoke detectors are installed in homes and buildings to detect that is typically an early sign of fire. Alerts raised by smoke detectors can be in the form of signals to a fire alarm system. Gas detectors can detect the presence of harmful gases such as CO, LPG etc.

b. Smart City
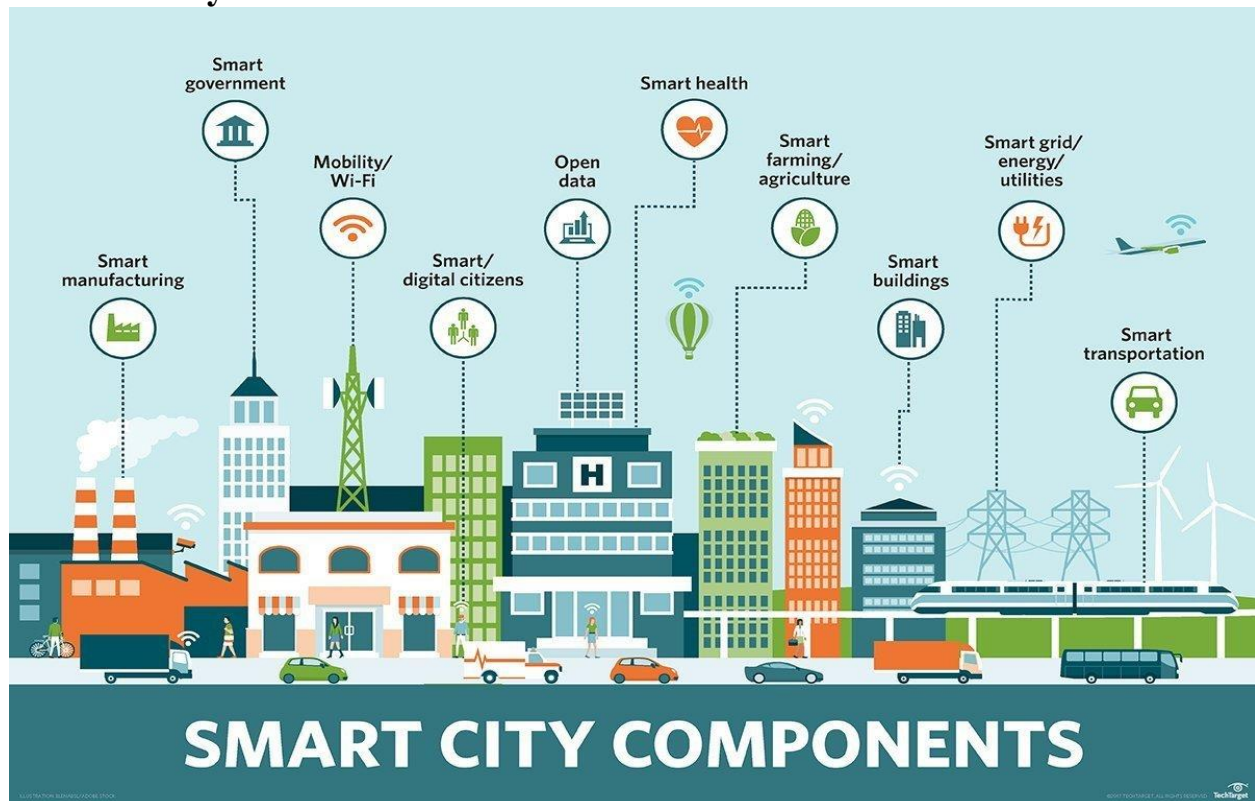
Smart Cities is not just a global trend, it's not some fancy technology revolution that everyone dreams about, in fact smart cities is a need and have to be apply as soon as possible. It is quite clear that technology has been filling the gap that could not be solved before such as inequity information availability and an equal standard life quality for all citizen.

In order to create an ideal Smart Cities for the citizen, there are least 5 element that a city must have:

Smart Governance: "SMART Governance" is about the future of the public services, SMART Governance utilize technology such as business application to facilitate and support better planning, decision and even the monitoring, it will also be improving governance transparency to transform the way public services are delivered.

Smart Living: Smart Living is about providing opportunities to improve the quality of its citizens' lives by guaranteeing a sustainable social including healthcare education and safety. By incorporating the latest technology into citizen daily activity, it will not only boost their productivity but also will help accelerating growth through digital world.

Smart Health Monitoring: Uses a network of sensors to monitor the vibration levels in the structure such as bridges and buildings.

Smart Environment: Ensuring liveable conditions within the cities is also an important matter in developing smart cities, the concept of smart city is the use of technology to improve sustainability and better manage natural resources.

Smart Grid: Smart grids are digitally monitored, self-healing energy systems that deliver electricity or gas from generation sources. Smart grid solutions can be across industrial, residential as well as in transmission and distribution projects.

c. Smart farming
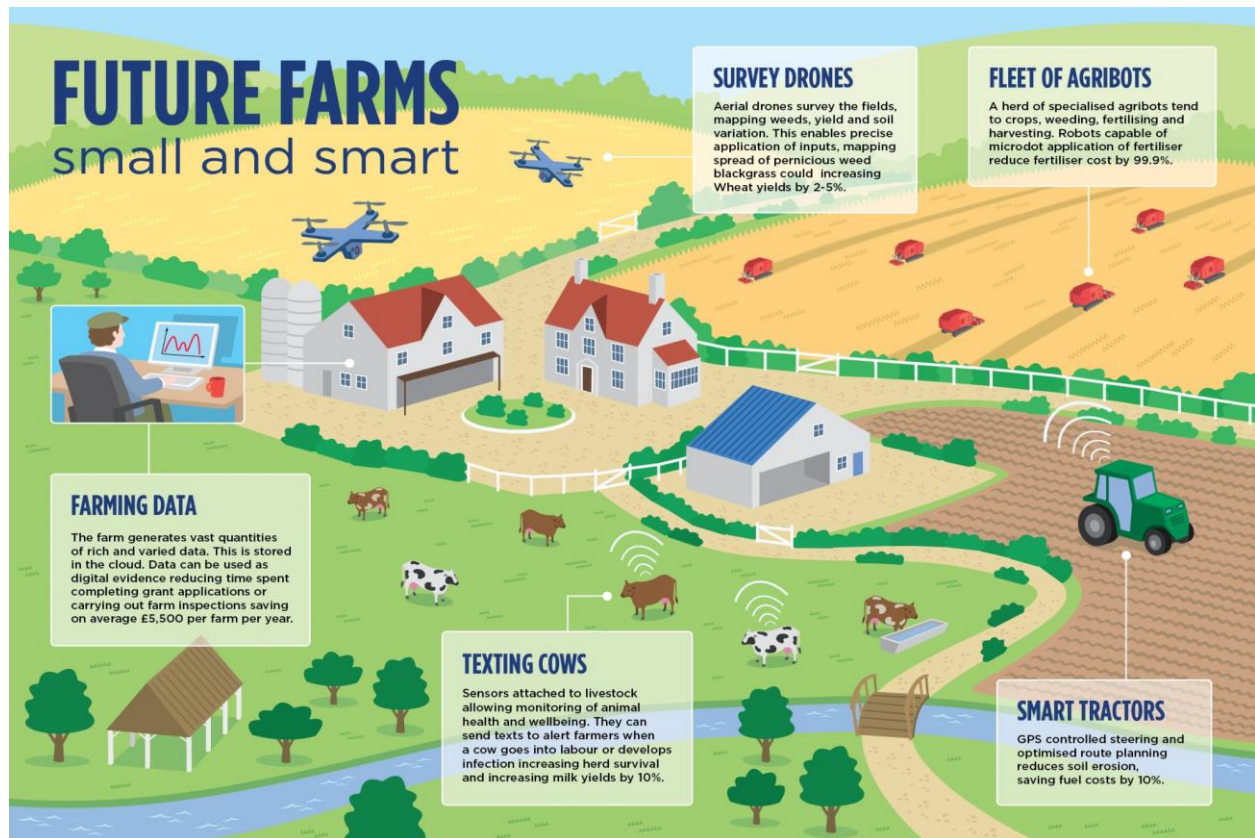
By using IoT sensors to collect environmental and machine metrics, farmers can make informed decisions, and improve just about every aspect of their work – from livestock to crop farming. For example, by using agriculture sensors to monitor the state of crops, farmers can define exactly how many pesticides and fertilizers they have to use to reach optimal efficiency.

There are many types of IoT sensors for agriculture as well as IoT applications in agriculture in general:

a.) Smart Irrigation: To determine moisture amount in soil.

b.) Gren House Control: Typically, farmers use manual intervention to control the greenhouse environment to improve productivity.

c.) Monitoring of climate conditions: Probably the most popular smart agriculture gadgets are weather stations, combining various smart farming sensors. Located across the field, they collect various data from the environment and send it to the cloud. The provided measurements can be used to map the climate conditions, choose the appropriate crops, and take the required measures to improve their capacity.

d.) Crop Management: You can monitor your crop growth and any anomalies to efficiently prevent any diseases or infestations that can harm your yield.

e.) Agricultural drones: Perhaps one of the most promising advancements is the use of agricultural drones in smart farming. Also knows ad UAVs (Unmanned Aerial Vehicles), drones are better equipped than airplanes and satellites to collect agricultural data.

Exercise 16
Installation of Antivirus Software

There are many antivirus products available in market like Avast, Quick Heal, McAfee, Kaspersky, Norton, Trend, AVG Antivirus, Avira, etc.
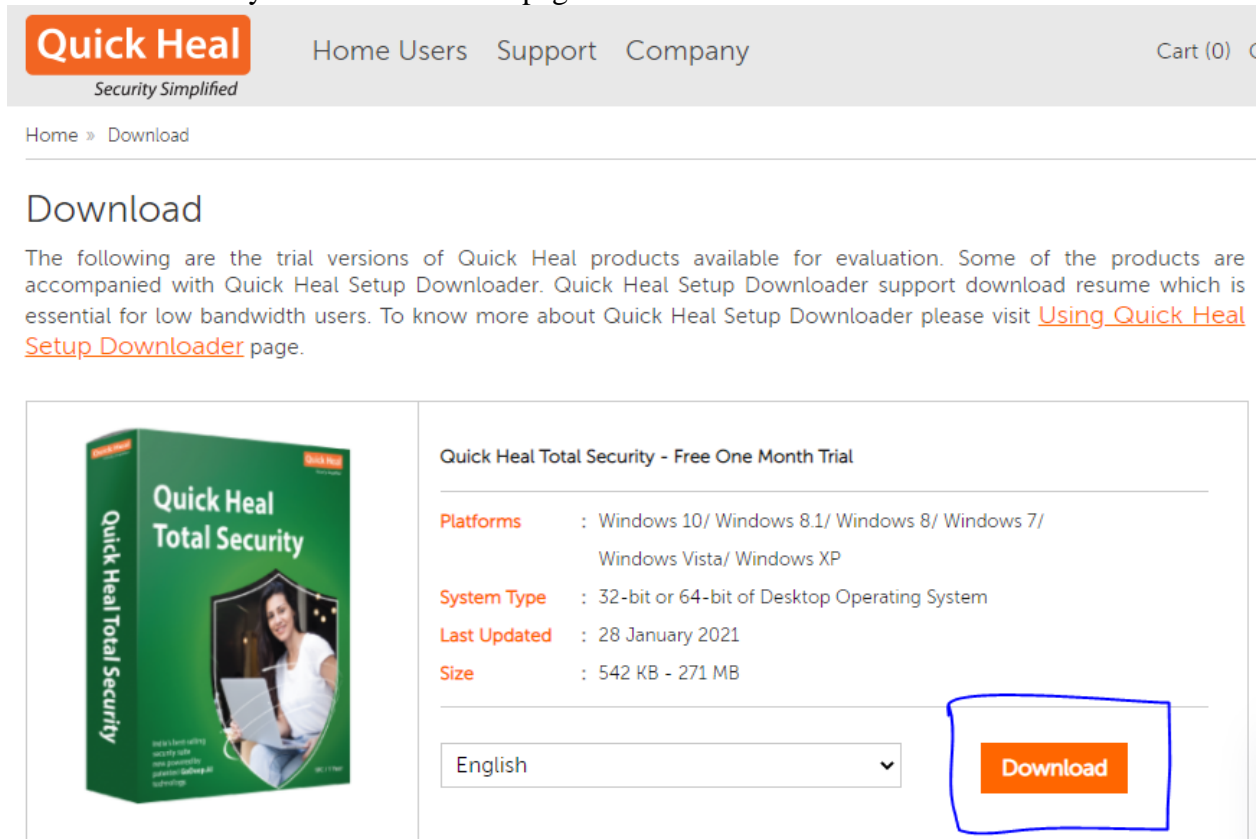
Now we are considering Quick Heal Antivirus and below are the steps to install.

First ensure no other application or antivirus software is running on your PC.

Step 1: Click or Type the below link in your internet browser's address bar (URL).
                    https://www.quickheal.com/download-free-antivirus
This link redirects you to file download page.

Step 2: Click on Download button.

Step 3: Wait for sometimes until download completes.

Step 4: Right the setup.exe as administrator and then click yes
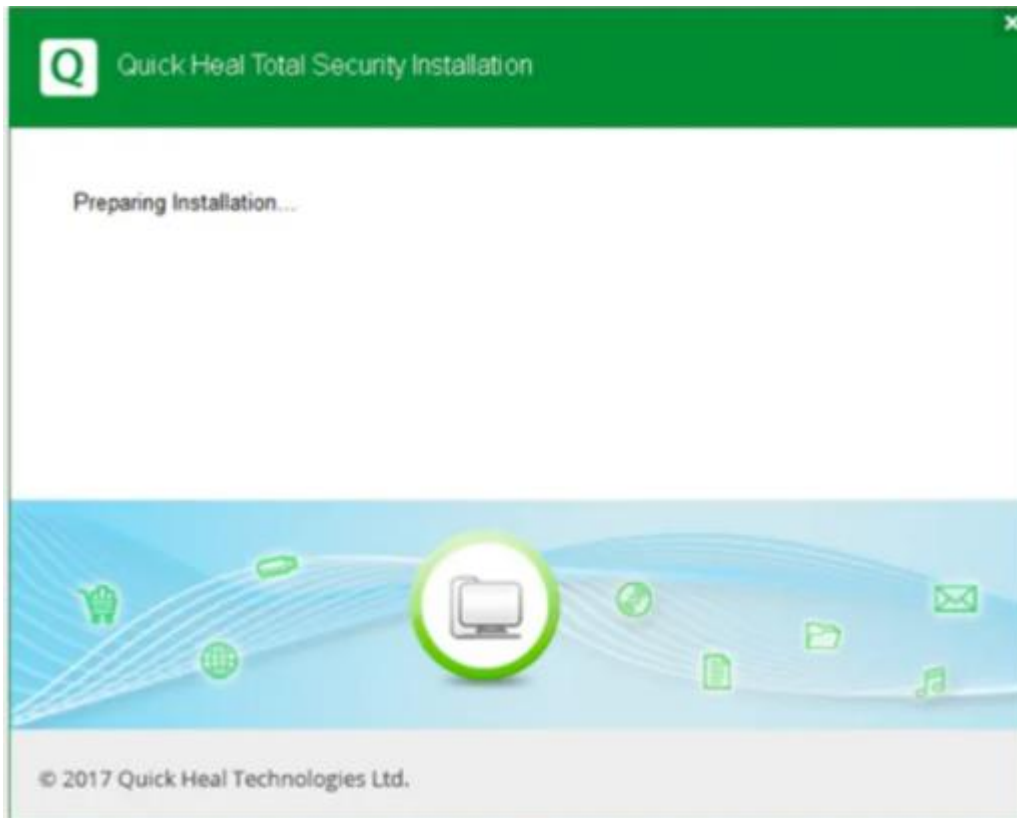
Step 5: Read the User and License and Agreement carefully and check the box that says 'I Agree'
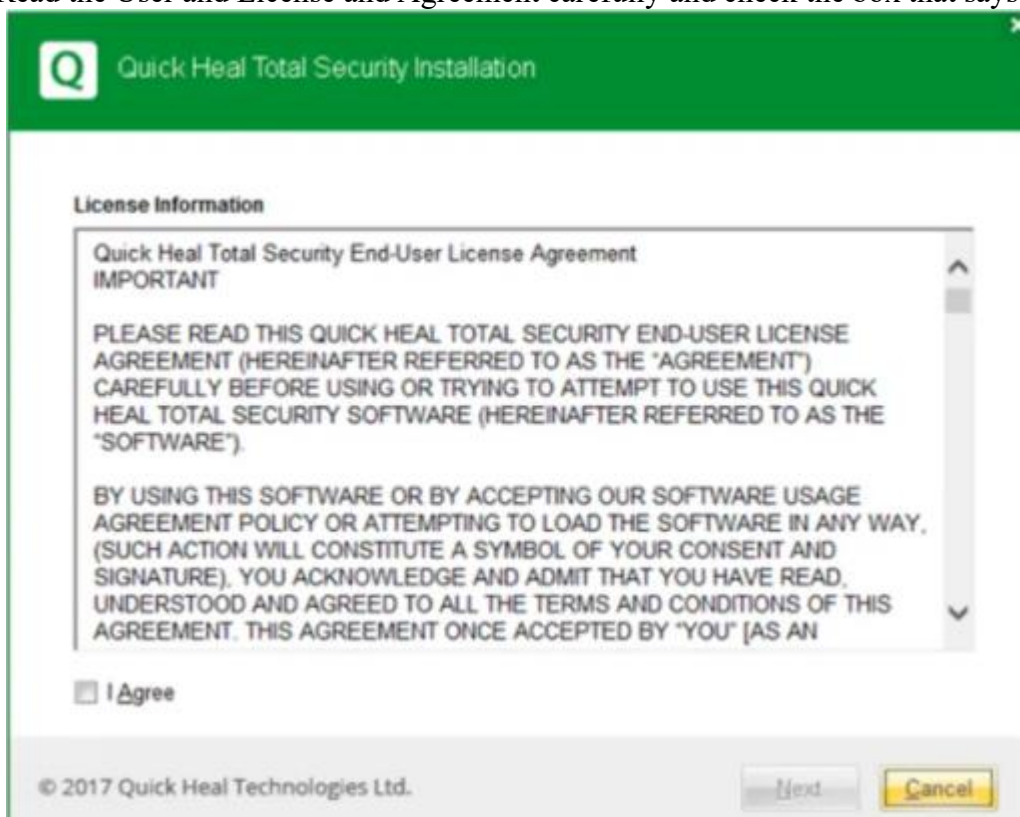
Step 6: Select the drive where the software is to be installed.
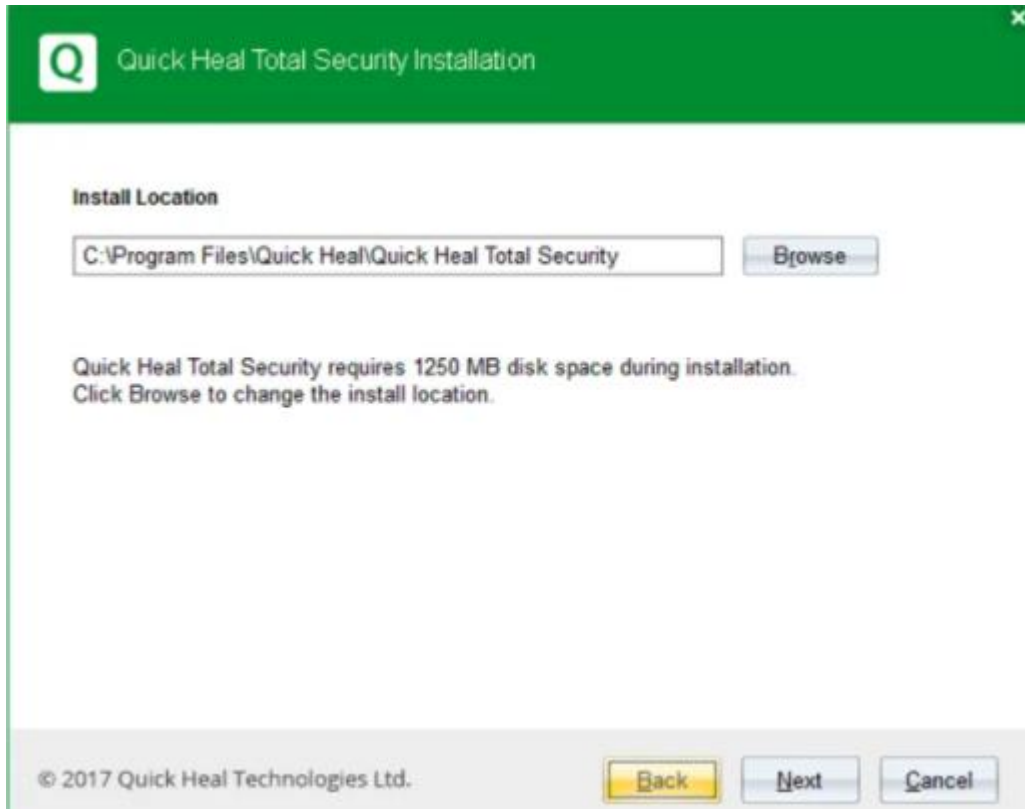
Step 7: Let it install files in the selected drive, till it is 100% complete.
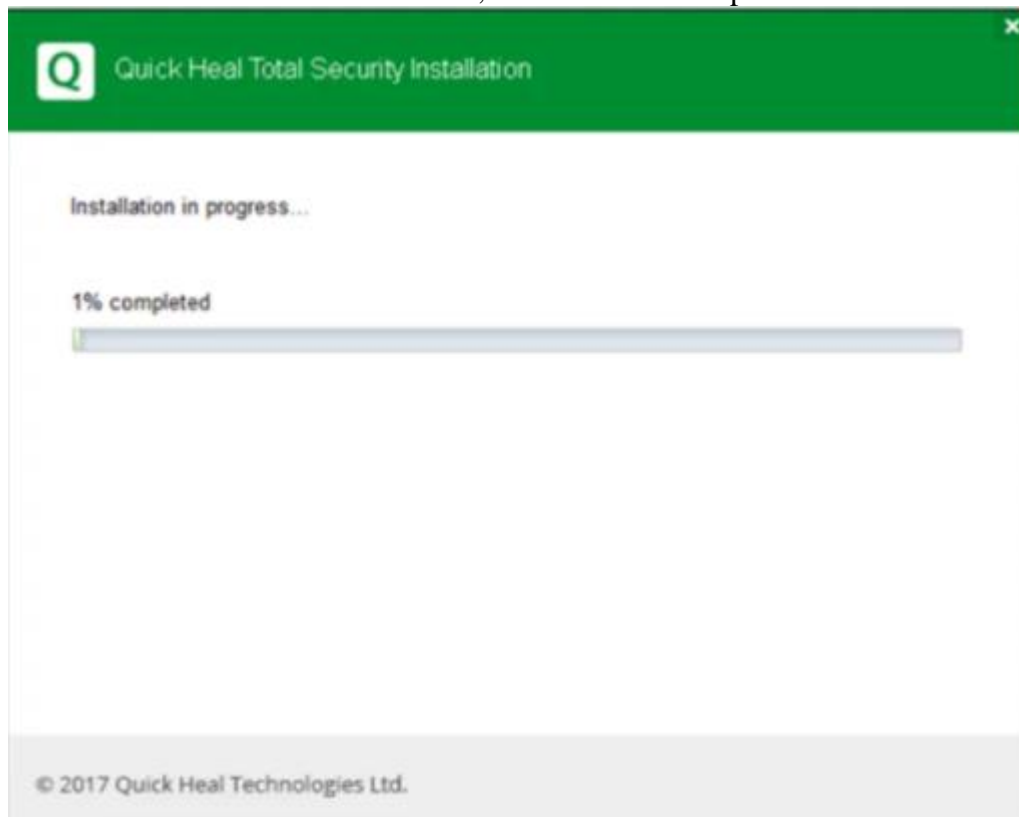
Step 8: Once completed, it will ask you to register the product. Click on 'Register Now'.
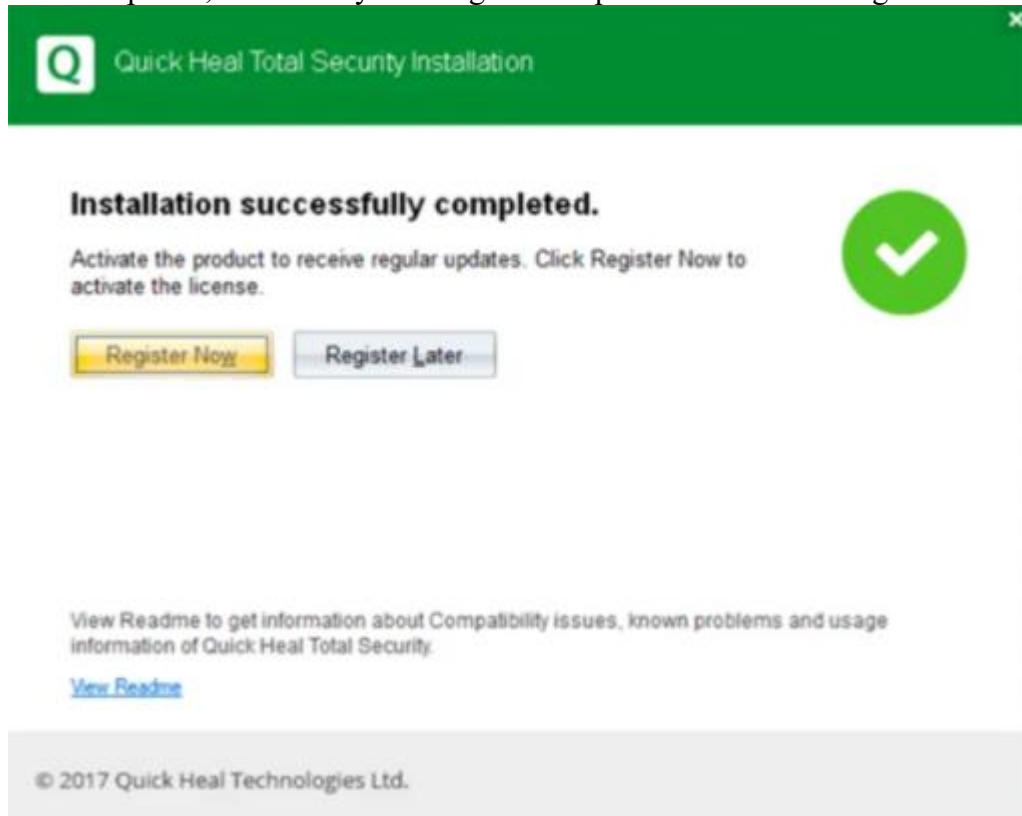
Step 9: Registering Quick Heal Antivirus License Offline

There are two ways of registering your Quick Heal copy. You can register offline if the system or device isn't connected to the Internet.

Before visiting the offline activation page, ensure that you have the product key and the installation number with you.

The product key can be found printed either on or inside the product packaging or will be provided when you **purchase Quick Heal Antivirus Total Security online.**

With the help of a connected device, visit the offline activation page

Fill the registration form and enter the product key received after buying the product.

Step 10: Installing Quick Heal Antivirus with Product Key Online

Buy Quick Heal Total Security key after installing the free version from the .exe file downloaded from the website. For premium and pro versions, register the product key provided with the product purchase.

Exercise 17
Demonstration and hands-on browser settings

Google Chrome

1.) Setting the default browser: Go to settings and click the Default Browser "Make Default" button.
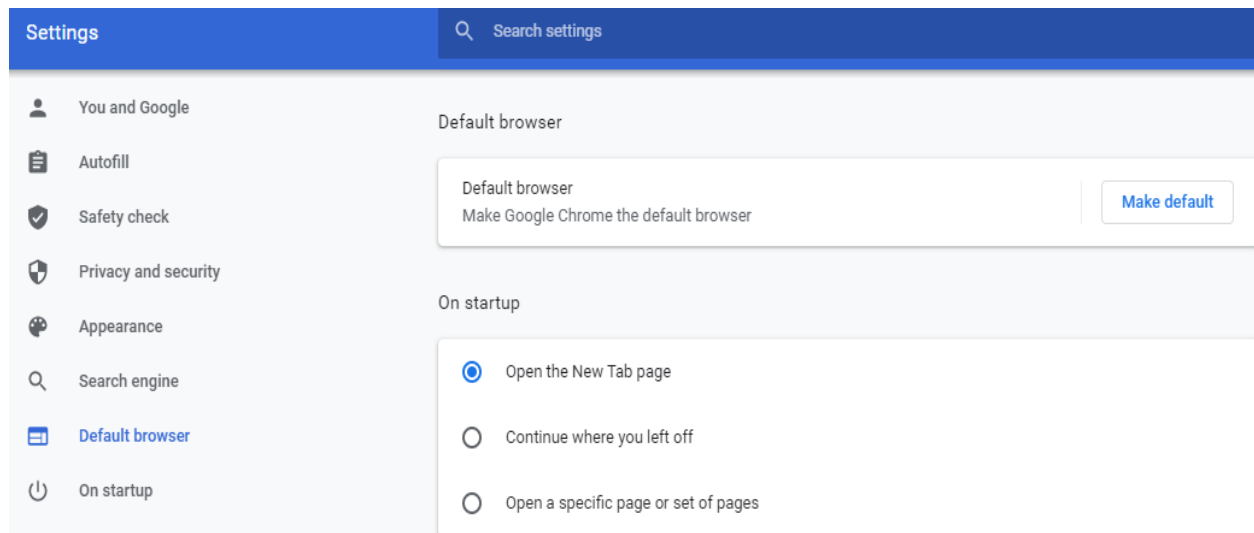
2.) Block unwanted pop-ups: Go to setting → under privacy and setting, click on site settings. Under Content click on pop-ups and redirect.

Content

🍪   Cookies and site data
     Third-party cookies are blocked in Incognito mode   ▸

<>   JavaScript
     Allowed   ▸

🖼   Images
     Show all   ▸

↗   Pop-ups and redirects
     Blocked   ▸

Additional content settings   ⌄
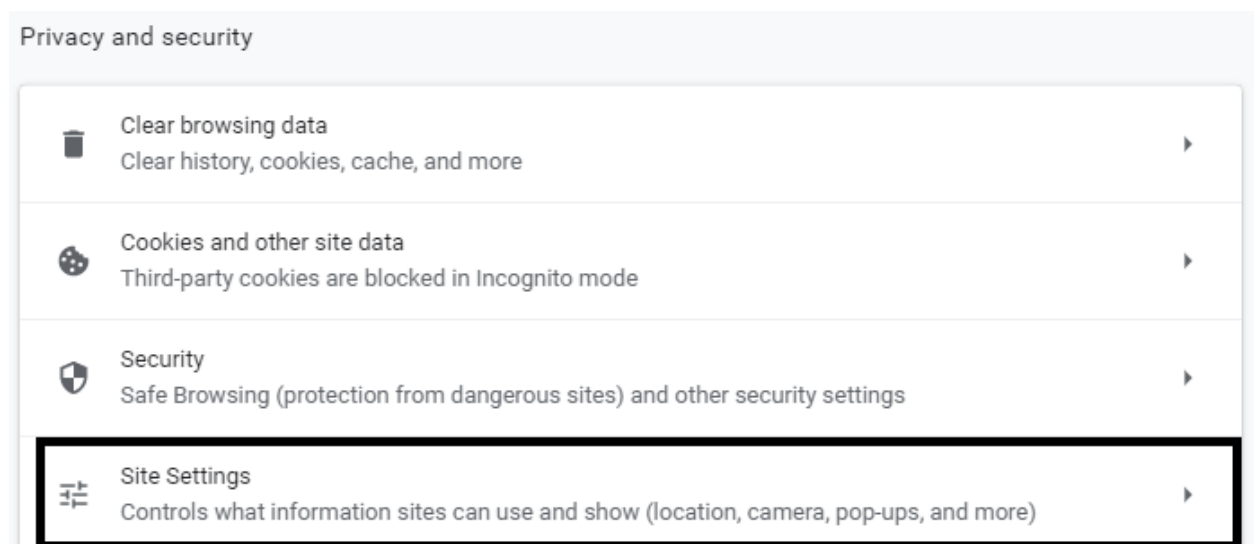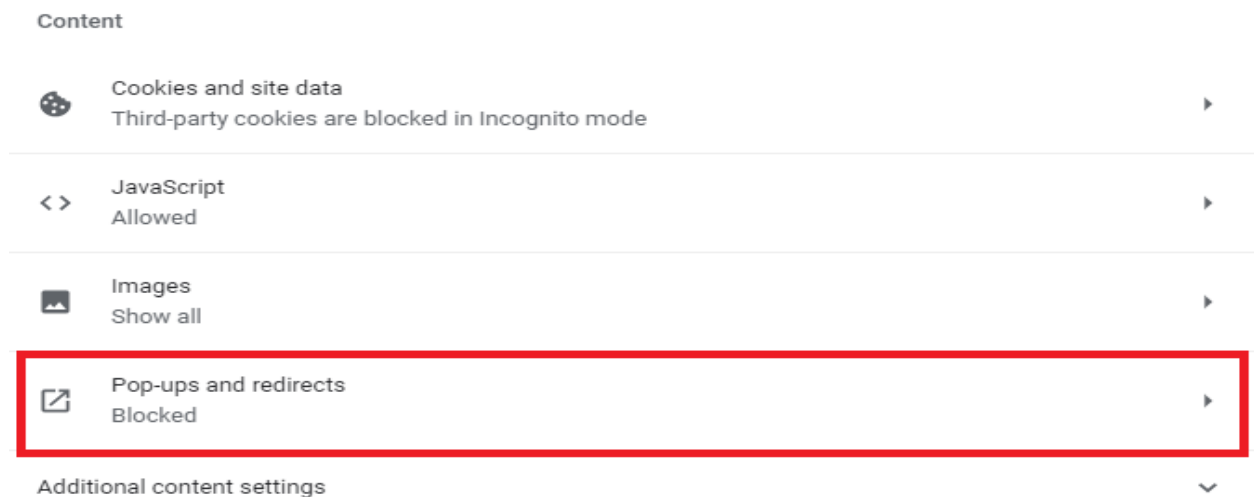
3.) Block unwanted plugins: Go to settings → Extensions → Turn on / off when needed.
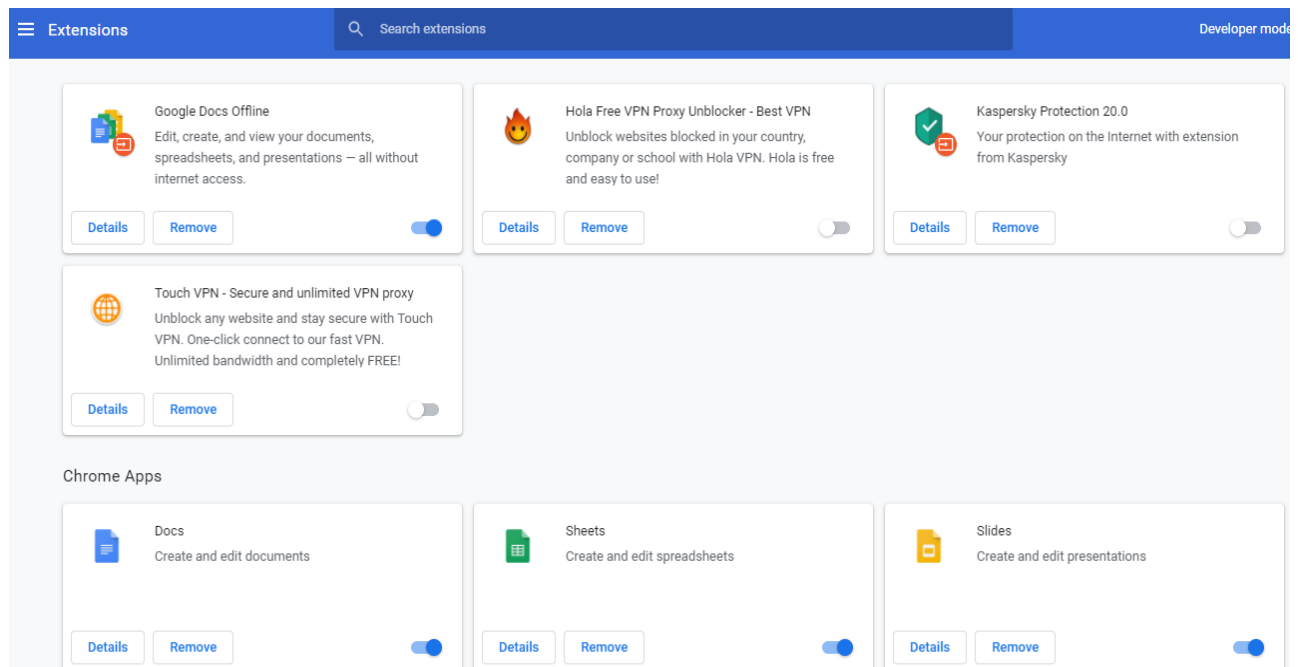
4.) Do not save passwords: Go to settings → Click on Autofill → Passwords

← Passwords   ?   🔍 Search passwords

Offer to save passwords   ⬤

Auto Sign-in
Automatically sign in to websites using stored credentials. If disabled, you will be asked for
confirmation every time before signing in to a website.   ⬤

Check passwords
Keep your passwords safe from data breaches and other security issues   ▸

View and manage saved passwords in your Google Account
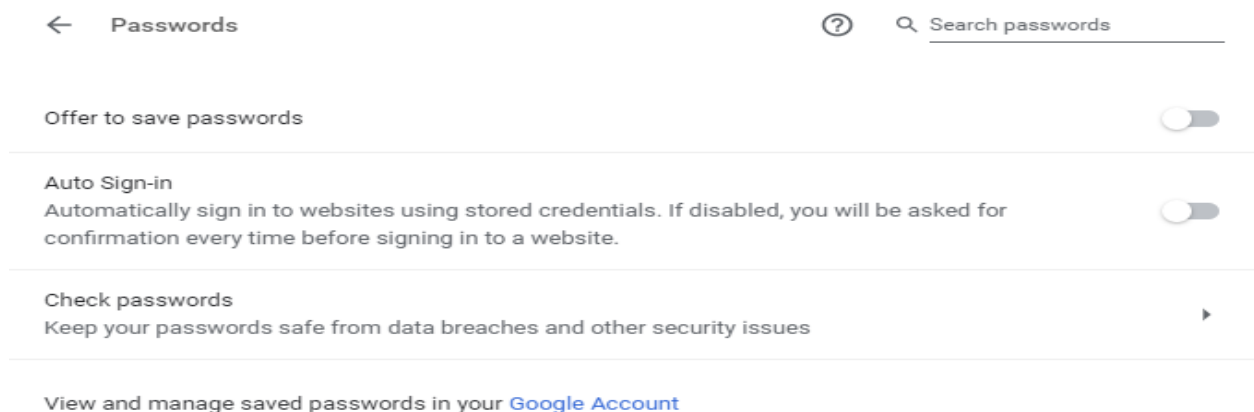
5.) JavaScript: Go to setting → under privacy and setting, click on site settings, under content → click on JavaScript and turn on (Recommended).

Content

Cookies and site data
Third-party cookies are blocked in Incognito mode   ▸

<> JavaScript
Allowed   ▸

Images
Show all   ▸

Pop-ups and redirects
Blocked   ▸

← JavaScript   Q Search

Allowed (recommended)   ⬤

Block   Add

        No sites added

Allow   Add

        No sites added
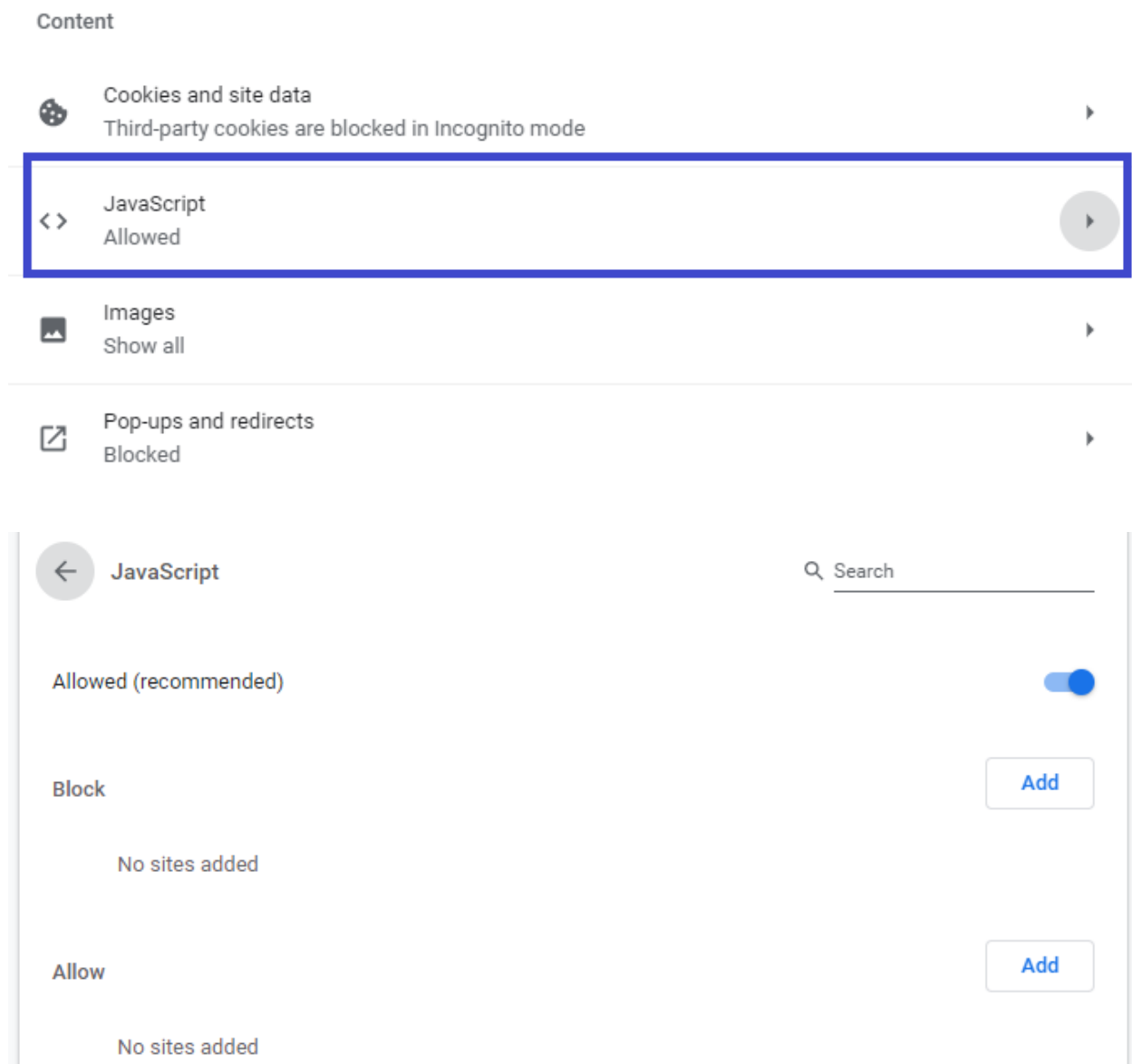
6.) Handling Cookies: Go to settings → Privacy and security → click on Site settings → under content → click cookies and site data → Turn on Block Third part cookies (Recommended)

Content

Cookies and site data
Third-party cookies are blocked in Incognito mode   ▸

General settings

○   Allow all cookies   ⌄

○   Block third-party cookies in Incognito   ⌄

◉   Block third-party cookies   ⌃

        🍪   Sites can use cookies to improve your browsing experience, for example, to keep you signed in or
                to remember items in your shopping cart

        ⊘   Sites can't use your cookies to see your browsing activity across different sites, for example, to
                personalize ads. Features on some sites may break.

○   Block all cookies (not recommended)   ⌄

Clear cookies and site data when you quit Chrome   ○

Send a "Do Not Track" request with your browsing traffic   ○

Preload pages for faster browsing and searching
Pre-fetches information from pages, including pages you have not yet visited. Information fetched   ●
may include cookies, if you allow cookies.

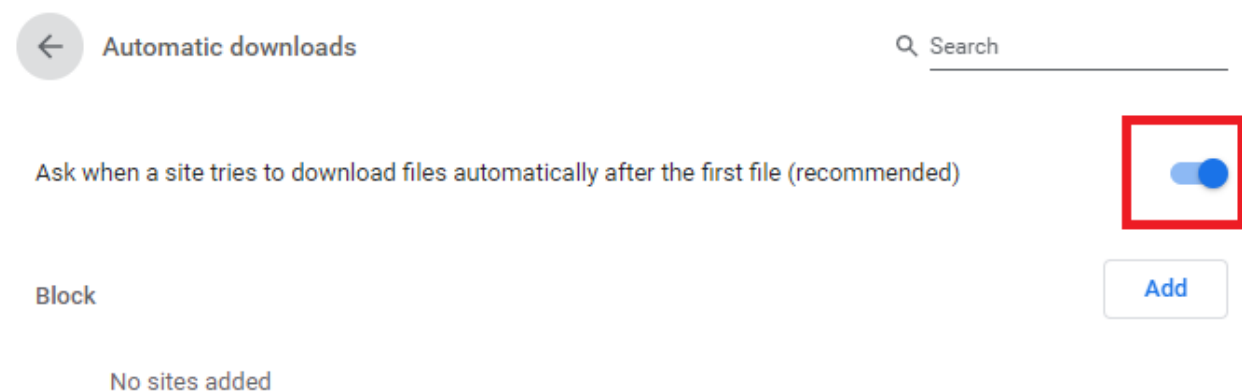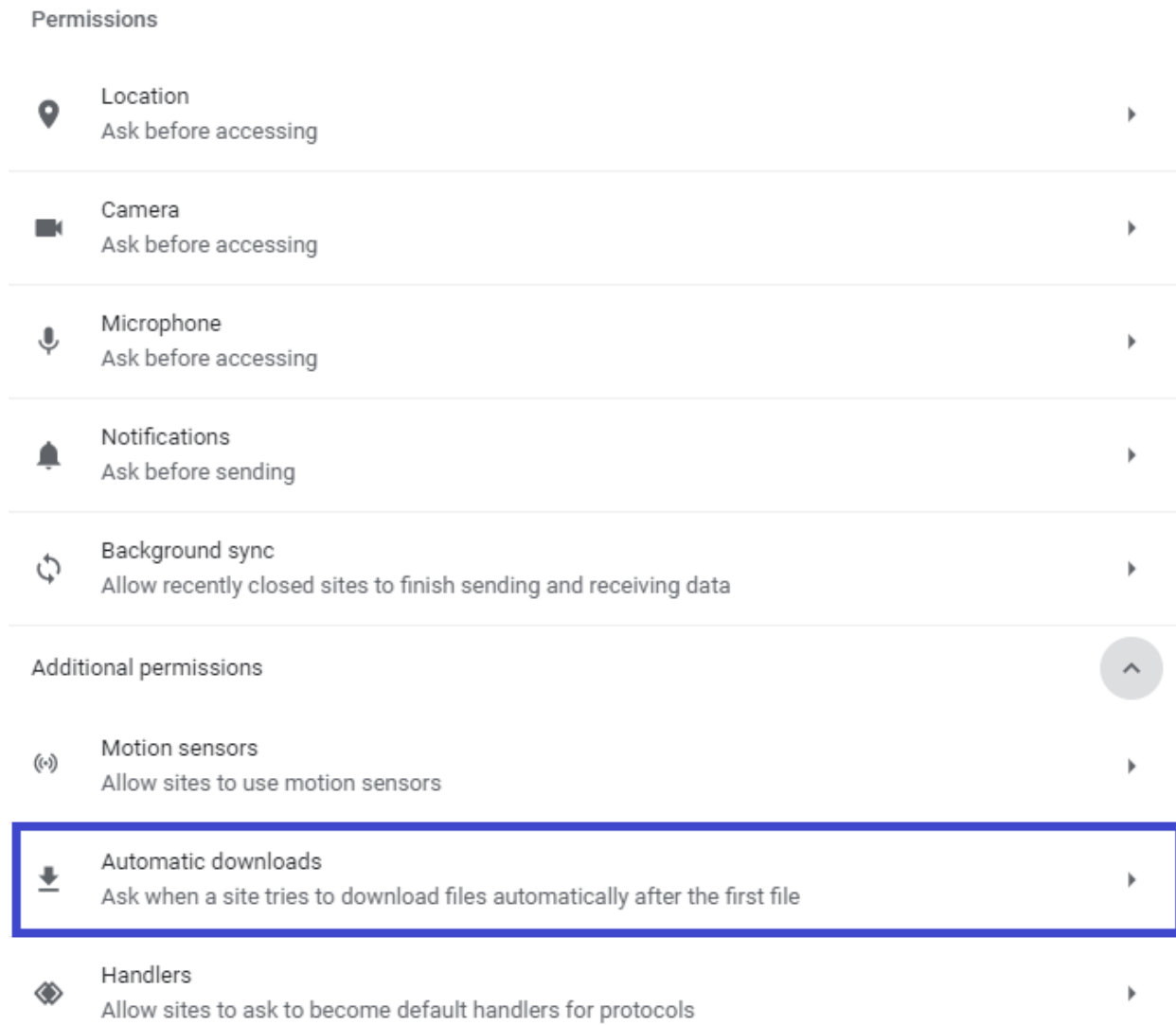**7.) Automatic Downloads:** Go to settings → Privacy and security → Site setting → Scroll down and click on Additional Permissions (Under Permissions) → click on automatic downloads → Turn on "Ask when a site tries to download files" (Recommended)

Permissions

📍 Location
Ask before accessing   ▸

📹 Camera
Ask before accessing   ▸

🎤 Microphone
Ask before accessing   ▸

🔔 Notifications
Ask before sending   ▸

🔄 Background sync
Allow recently closed sites to finish sending and receiving data   ▸

Additional permissions   ⌃

((•)) Motion sensors
Allow sites to use motion sensors   ▸

⬇ Automatic downloads
Ask when a site tries to download files automatically after the first file   ▸

◈ Handlers
Allow sites to ask to become default handlers for protocols   ▸

← Automatic downloads   Q Search

Ask when a site tries to download files automatically after the first file (recommended)   🔵

Block   Add

No sites added

8.) Camera / Microphone Access: Go to settings →Privacy and setting → Site settings → Click on Camera / Microphone → Turn on / off when needed.

Permissions

Location
Ask before accessing

Camera
Ask before accessing

Microphone
Ask before accessing

Notifications
Ask before sending

Background sync
Allow recently closed sites to finish sending and receiving data

← Camera   Q Search

HP Truevision HD (04f2:b509) ▾

Ask before accessing (recommended)
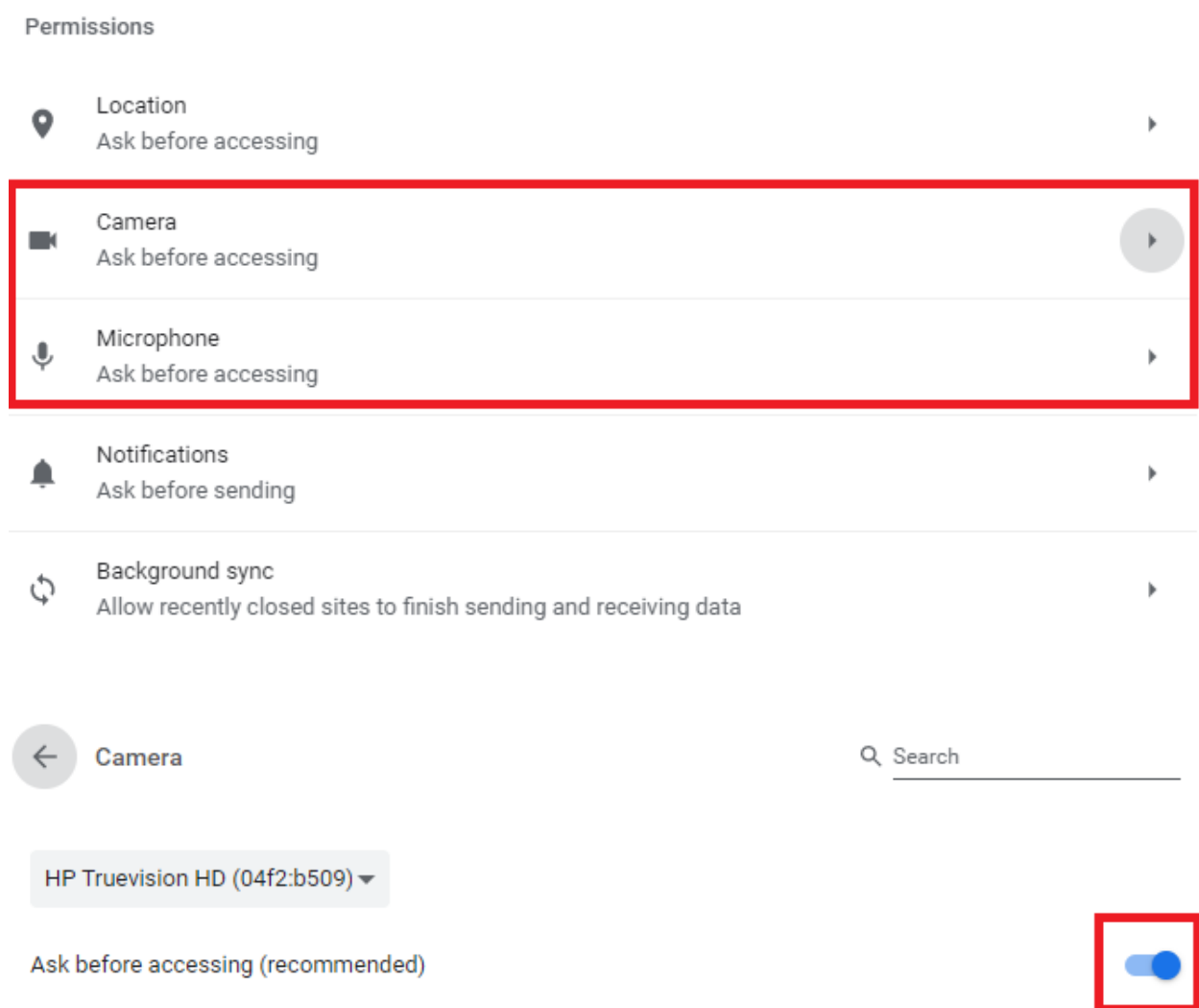
Exercise 18
Demonstration and hands-on privacy settings and password policy.

There are many steps you can take to keep your private data secure.

1.) Password-protect for everything

➤ All your digital devices like computers, tablets, smartphones or any other gadget with personal data on them should be password protected for increased security. A lost or stolen gadget without password protection is a source of personal information for whoever has it. This can lead to identify theft and worse.

➤ The same advice goes for online accounts. Since most of these need a password to set up, the challenge is making strong passwords.

➤ Change the default passwords for anything connected to your home network.

2.) Keep your computer virus-free

➤ Digital security has a lot to do with digital privacy. If your computer, infected by a virus or malware, not only can hackers dig through your data to steal your identity, but they may lock up your files and ask for a ransom to get them back. The solution is to run an antivirus program to watch for viruses and keep your information very safely.

➤ Make sure your operating system is up to date with latest security patches. To make that process easier, we recommend turning on auto-update features for OS that you use.

3.) Secure your browser

➤ Your browser is how you interact with the digital world, and if you aren't careful, you could be leaving a trail of footprints behind you as you browse.

➤ The first step for keeping advertisers out of your browser is turning off third part cookies.

➤ Use Incognito Mode / private browsing mode. This deleted your cookies, browsing history and other temporary files whenever you close the windows. (For example: In Firefox → Go to File / Menu → Click on New Private Window.)

4.) Switch search engines

        Most search engines keep tabs on what you're looking for so they can target ads your tastes. If you have a habit to use multiple browsers then the site doesn't track any of your personal data.

5.) Be careful what you share on social media

Social media can feel like a conversation with your closest friends, but it may be a conversation the whole world can see. If you post enough on social media, the information can be used to track where you are and what you're up to.

6.) Don't fall for scams

Beware of websites, phone calls and emails that try to part you from your personal information. A common tactic with scammers is to pressure you into giving up your personal information. **Example:** A Scammer may tell you that you're being audited by the IRS or that your computer has a dangerous virus and they can fix it by handing over your personal information.

7.) Only use software you trust

Whether you're installing new software on your phone or your computer, make sure you're getting it from a source you trust. Legitimate-looking software can sometimes turn out to be a complete scam.

8.) Only use secure Wi-Fi Connections

It's not convenient to use the free Wi-Fi service at coffee shops, railway stations or airports, because there is no one telling who is watching that internet traffic. If you use public Wi-Fi, don't use it to convey private information.

<div align="center">

Exercise 19
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Demonstration of common security threats (using videos)
a. Phishing
b. DoS attack
c. Man in the middle attack
d. Spamming
e. Virus

a. Phishing

Phishing is a type of Social Engineering attack often used to steal user data, including login details, account numbers and credit card information.
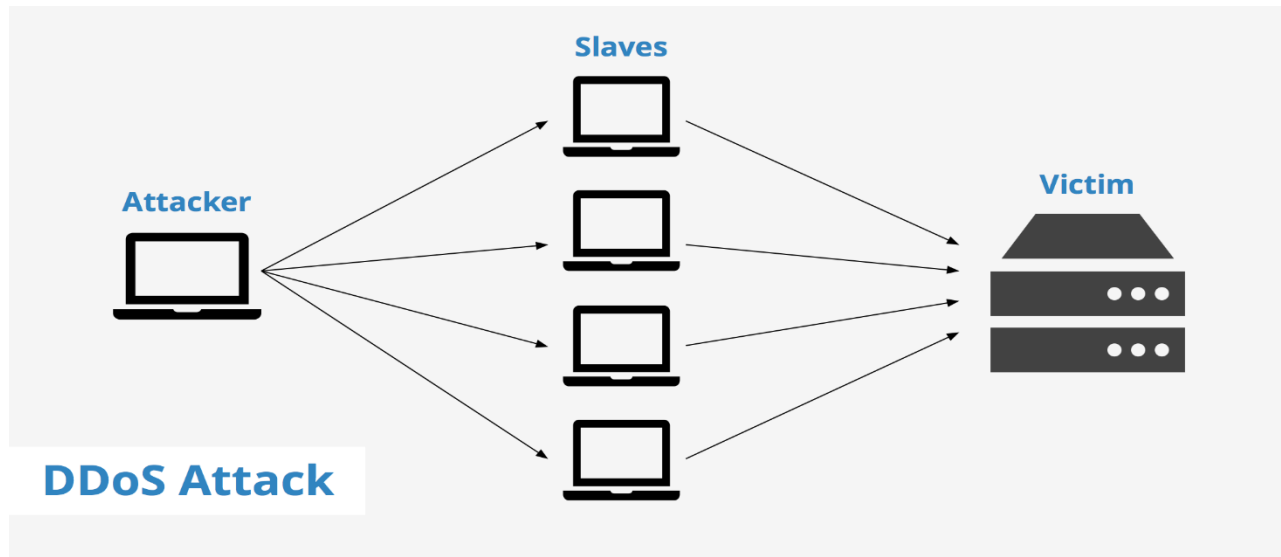

Types of Phishing Attacks
1. Spear Phishing

2. Whaling

3. BEC (Business Email Compromise)

4. Clone Phishing

5. Vishing

b. Dos Attack

A Denial-of-Service (Dos) attack is an attack meant to shut down a machine or network, making it inaccessible to its intended users. It is used to deny legitimate users access to a resource such as accessing a website, network, emails etc.

Types of Dos Attacks
1. Application-layer Flood / Dos
2. Distributed DoS

c. Man in the Middle Attack

A man in the middle (MITM) attack is a general term for when a perpetrator positions himself in a conversation between a user and an application-either to eavesdrop or to impersonate one of the parties, making it appear as if a normal exchange of information is underway.

The goal of an attack is to steal personal information, such as login credentials, account details and credit card numbers.
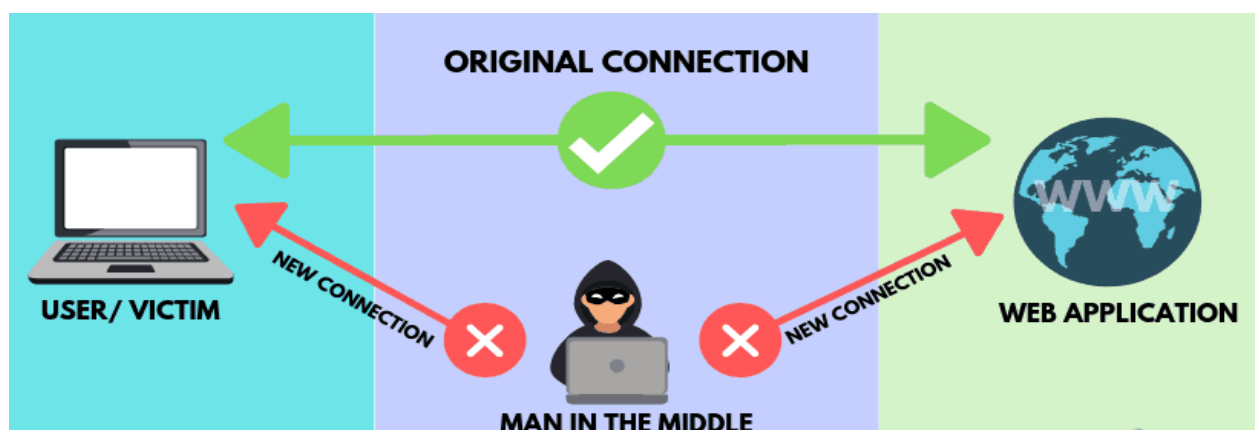
Types of Man in the Middle Attacks
1. IP Spoofing
2. DNS Spoofing
3. HTTPS Spoofing

4. SSL Hijacking

5. Email Hijacking

6. Wi-Fi Eavesdropping

7. Stealing browser cookies

d. Spamming

Spamming is when one person or company sends an unwanted email to another email to another person. Spam emails are the computer version of unwanted "**Junk Mail**" that arrives in mailbox, such as advertising pamphlets and brochures.

Types of Spam

1. Advance-fee scams

2. Phishing Emails

3. Malspam

e. Virus

A computer virus is type of malicious code or program written to alter the way a computer operated and is designed to spread from one computer to another. In the process, a virus has the potential to cause unexpected or damaged effects, such as harming the system software by corrupting or destroying data.

Types of Computer Virus
1. Boot sector virus

2. Web scripting virus

3. Browser hijacker

4. Resident virus

5. Macro virus

6. File infector virus