# URBAN SAFESCAPE

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***Abstract-*** **From the recent growth in the population, it has been observed high rise buildings has become a common style of living which helps us to meet the growing population. It has observed that there is a great risk occurring factors which can lead to a great extent of human loss. One of which is fire outbreak, during fire out breaks it has been observed that great life loss occurs not due to burnings but because of suffocation and stampede. So, to resolve this situation we propose an evacuating system where we can go for a mass evacuation without any human loss.**

**For which an intense survey has been conducted in order to know about the growth of Highrise structures and fire safety importance incurred. And based upon the survey an intensive literature review has also been made in order to know all about the existing fire safety mechanisms.**

**Coming to the technical details in the present study of the fire evacuating system, the system is currently designed for 10 floors and the carrying capacity is of 20 humans in one go, the material used for the ramp that carry humans is made up of MS plate (galvanizing steel), the basic principle involved is of hydraulics which helps us for the elevation of the ramp that which is used for the mass evacuation. The system has also been provided with the flexible railing system that can be hidden when the system is not in use.**

**Hydraulic system with the principle of elevation in vertical direction is working principle used in the working of the emergency evacuation lift. The lift system can be used in case of emergencies like a fire outbreak. The platform can be lifted using an emergency switch that is placed on the ground floor for better operation. The lift has a predefined weight carrying capacity. This will enable the lift to operate efficiently. The present project has the ability to go for a safe and secure mass evacuation, it is a one-time investment which can be used until the building's life.**

## INTRODUCTION:

High rise structures are the present growing trend in the world. Fire safety is one the major aspect which been observed in the high-rise structure because at the time of fire outbreak it is observed that evacuation of people is very complex.

Fire safety is a set of principles or say practices opted in order to reduce destruction caused by fire. Fire safety measures includes all the necessary practices that has to be opted at the time of fire outbreak to stop and to limit the spread of fire. Generally, fire safety measures are seen at the pre-construction as well as construction phase of a building. Fire safety is often a component of building safety. For limiting the occurrence of sudden fire outbreak, we have some set of standard fire policies which have to be followed by each and every one in the construction the building. The materials which may increase the likelihood of a fire or may impede escape in the fire of fire are termed as fire hazards.

Some of the common fire hazards are:

- Kitchen appliances that which runs on gas
- Electrical systems
- Combustible storage areas
- Candles
- Smoking areas
- Flammable solvents etc.

So, by seeing the increasing cases of fire out breaks government had created a set of criteria for fire preventions and safety in the event of a fire such as fire escape etc. which is also termed as fire codes.

And they had also made is mandatory to have a proper fire safety plan which nothing but an official document guiding the organization or people on procedures that should be followed in the event of a fire accident.

So, as it is seen that proper plans and codes are not only enough for saving the livelihood many scientists had come up with many ides in order to ease the problem. Some of which are:

- Fire escape
- Halon
- Sprinkler system
- Fire extinguisher

- Security and protection systems
- Fire alarm

Fire escape as mentioned above is a practice or equipment or technique used at the time of fire outbreak. And the history of fire escape takes us to the early 18 th century. New fire escape concepts are becoming more and more common as buildings are constructed at ever-increasing heights. Though historically not employed as fire escapes, lifts are increasingly being considered as a potential evacuation route for high-rises and skyscrapers. Parachutes, external collapsible lifts and slides are additional high-rise fire escape options. [12-18]

Hydraulics can be traced back as far as the 6th millennium BC, where water power was used by ancient Mesopotamians and Egyptians for irrigation to 1940's where the first hydraulic fracturing experiment take place.[19] And even in the modern era we can see the use of hydraulics in our day-to-day materials like cranes, lifts etc.

A fire outbreak can be caused by many factors like in proper wiring, any leakages, improper working that involves fir. Generally, it had seen that each year an estimated 3,68,500 residential buildings were reported to fire within the United States in a span of three years from 2017 to 2019. And coming to India it is estimated to 10000+ deaths caused due the fire outbreak in the buildings but as seen in this number was decreased by 50% in the past 8 years although it decreased still accidents caused due to fire is still a big treat to us.

There are many drills, equipment etc. were placed as well as created in order to control the life loss in fire accidents like planning a proper fire evacuation plan which involves:

- Fire evacuation strategy
- Action on discovering a fire
- Action on hearing the fire alarm
- Calling the fire brigade
- Power/process isolation
- Identification of key escape routes
- Fire wardens/marshals
- Places of assembly and roll call
- Firefighting equipment provided
- Training required
- Personal Emergence Evacuation Plan
- Liaison with emergency services

Each one above has its own prior importance at the time of a sudden fire outbreak.

At the time of construction phase people had included many fire systems like detectors, alarms, emergency stair cases etc. but even then, we can see many deaths.

Software used:

- Prisma 3d:

When I last updated this information in September 2021, Prisma 3D was not a widely installed or recognized 3D program application. It is conceivable that since then there have been modern advances or changes in the program, but I can give some general data based on what was known at the time.

Prisma 3D, according to my information, is a 3D modelling and operations computer program designed for multipurpose devices, especially for the iOS and Android platforms. Here are some important subtleties surrounding it:

1. Customer Interface:

Prisma 3D has advertised an intuitive and user-friendly interface, making it open to even beginners as well as experts. It is expected to work well on touchscreen devices, allowing customers to easily create 3D models and animations.

2. Highlights:

Modelling:

Prisma 3D allows customers to create 3D models from scratch. It published a series of basic 3D modelling tools for forming and manipulating objects.

Textures:

Customers seem to apply surfaces and colors to their 3D models to make them look more visually appealing.

Fixing and Liveliness:

The computer program had movement highlights, counting the capacity to fix models for movement and make liveliness utilizing keyframes.

3. Send out and Sharing:

Clients could export their 3D manifestations and share them with others. The computer program likely bolstered different record designs for sending out, making it conceivable to utilize the models in other 3D applications or share them on social media.

4. Community and Learning:

Prisma 3D may already have a community of customers who share their work and educational exercises to help others learn and improve their 3D modelling and animation skills.
5. Platform Compatibility:
It is basically designed for versatile devices and is available on both iOS and Android platforms, allowing users to work on their 3D projects while on the move.
If that's not too much trouble for you, please note that the program's applications may be changed, enhanced, or become outdated over time. If you are interested in using Prisma 3D or learning more about its current state and capabilities, I recommend checking out the official app stores for iOS and Android, as well as the communities and resources. Online resources related to 3D modelling and animation of computer programs.
Also, it's conceivable that Prisma 3D has gotten overhauls or modern forms since my final overhaul in September 2021, so you ought to investigate the most recent data and user surveys to urge the foremost exact and up-to-date experiences into the program.

- Knime analytics platform:

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2. Highlights:
Modelling:
Prisma 3D allows customers to create 3D models from scratch. It published a series of basic 3D modelling tools for forming and manipulating objects.
Textures:
Customers seem to apply surfaces and colors to their 3D models to make them look more visually appealing.
Fixity and vividness:
The computer program has motion highlights, including the ability to correct motion patterns and create vividness using keyframes.
3. Upload and share:
Customers can export their 3D renderings and share them with others. The computer program can support various save-to-send designs, making it possible to use the models in other 3D applications or share them on social networks.
4. Community and Learning:
Prisma 3D may already have a community of customers who share their work and educational exercises to help others learn and improve their 3D modelling and animation skills.
5. Platform Compatibility:
It is basically designed for versatile devices and is available on both iOS and Android platforms, allowing users to work on their 3D projects while on the move.
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Additionally, it is conceivable that Prisma 3D has undergone modern designs or looks since my last redesign in September 2021, so you should investigate the data and survey most recent users to get the most accurate and up-to-date experience within the program.

**LITERATURE REVIEW:**

Fire Safety in Building Design and Planning (References 1, 2, 3, 16)
Fire safety in building design and planning is a critical aspect of ensuring the well-being of occupants and the protection of property. This literature review explores the multifaceted dimensions of fire safety, spanning the responsibilities of architects, engineers, and specialists in integrating preventive measures into construction projects. Emphasis is placed on adhering to fire safety codes and standards during the planning and design phases to mitigate fire risks effectively.
Architects, engineers, and specialists play a pivotal role in integrating fire safety measures into construction projects. The literature underscores the importance of their collaboration in adhering to stringent fire safety codes and standards. By incorporating features such as fire-resistant materials, adequate exit routes, and compartmentalization, these professionals contribute to minimizing the potential impact of fires on both life and property.

Fire Suppression Technologies (References 7, 8, 9, 10, 11)
References 7 through 11 introduce various fire suppression technologies, including halon systems, sprinkler systems, and fire extinguishers. Halon, in particular, is known for its effectiveness in extinguishing fires in enclosed spaces. This section of the literature review would delve into the history, effectiveness, and environmental considerations associated with these technologies. This section delves into various fire suppression technologies, focusing on halon systems, sprinkler systems, and fire extinguishers. Halon, renowned for its efficacy in enclosed spaces, is examined in detail, including its historical development, effectiveness in extinguishing fires, and environmental considerations. The literature review scrutinizes the evolution of fire suppression technologies and their integration into modern building designs to enhance overall safety.

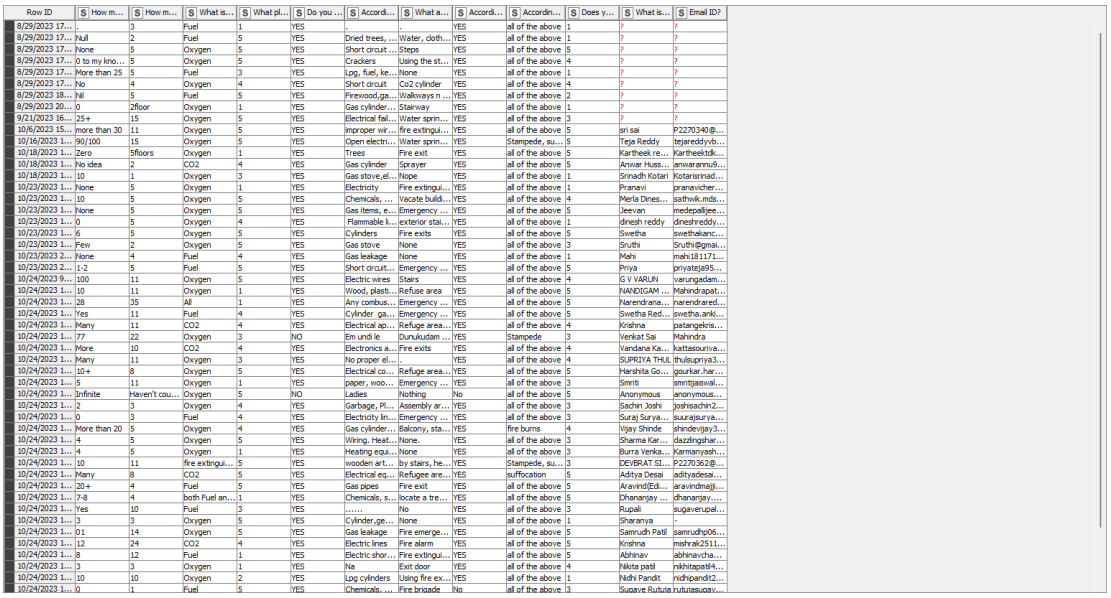
Historical Evolution of Fire Escape Systems (References 6, 12, 13, 14, 15, 17, 18)
References 6 and 12 provide insights into the historical development of fire escape systems. Reference 13 refers to a patent for a fire escape, highlighting innovations in this field. Reference 15, from Popular Mechanics in 1930, might offer a historical perspective on fire escape chutes. Additionally, References 17 and 18 discuss the counterintuitive use of elevators during high-rise fires. This section of the review would explore the evolution of fire escape systems and their role in modern building safety.

Government Regulations and Workplace Fire Safety (Reference 5):
The literature review shifts focus to government regulations and workplace fire safety in the United Kingdom. It examines governmental guidelines and regulations, emphasizing the role of employers in ensuring fire safety in workplaces. The responsibility of employers to protect employees is underscored, with an exploration of the regulatory framework that governs fire safety measures in commercial and industrial settings.
Hydraulics (reference 19):
It deals with the history of hydraulics from 600bc to 1940's. The final segment of the literature review delves into the history of hydraulics, spanning from 600 BC to the 1940s. This historical exploration provides insights into the development of hydraulic systems and their applications over centuries. By tracing the evolution of hydraulics, the review offers a comprehensive understanding of how this technology has shaped various industries and influenced engineering practices up until the mid-20th century.

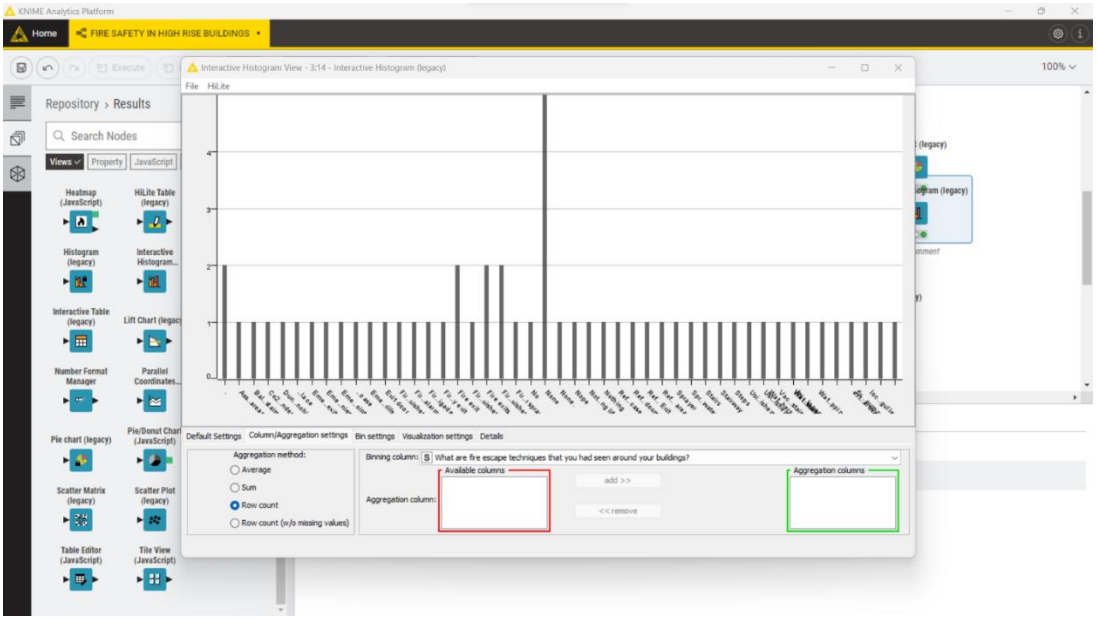
**SURVEY REPORT:**
So, as we had seen the growing demand of Highrise structures, we had conducted a survey regarding the Highrise structure where we conducted survey on the questions:

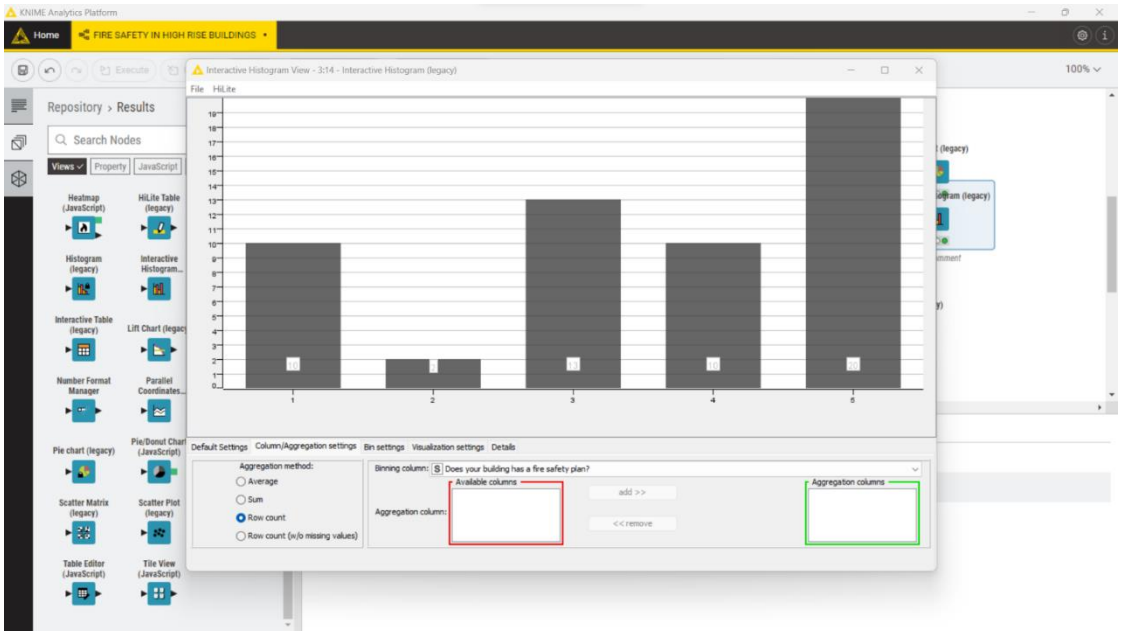
- How many 8 and above floor buildings are there in your locality?
- How many floors are there in your building?
- What is the main ingredient for a fire to burn and spread?
- What place does safety be in your life? (Rate it in the scale of 5)
- Do you feel fire safety is a very essential part of any building construction?
- According to you what might be the main fire hazard materials around you that might be a cause for a sudden fire outbreak? (Any 3)
- What are fire escape techniques that you had seen around your buildings?
- According to you how important is it for everyone to know about the fire safety practices or
- techniques?
- According to you what might be the main cause of loss in life at the time of a fire accident?
- Does your building have a fire safety plan?

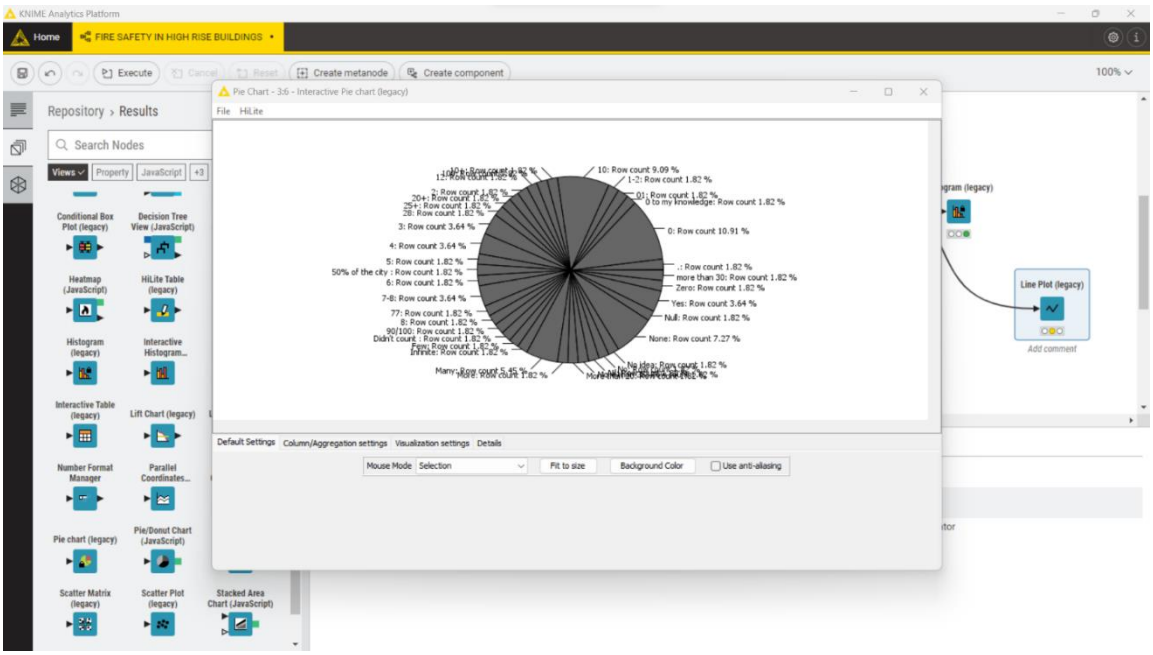
The survey responses are studied using knime analytical software and the results are as follow:
By using which we got statistical data on the above terms in a detailed manner and the statistical graphs so formed are self-explanatory.

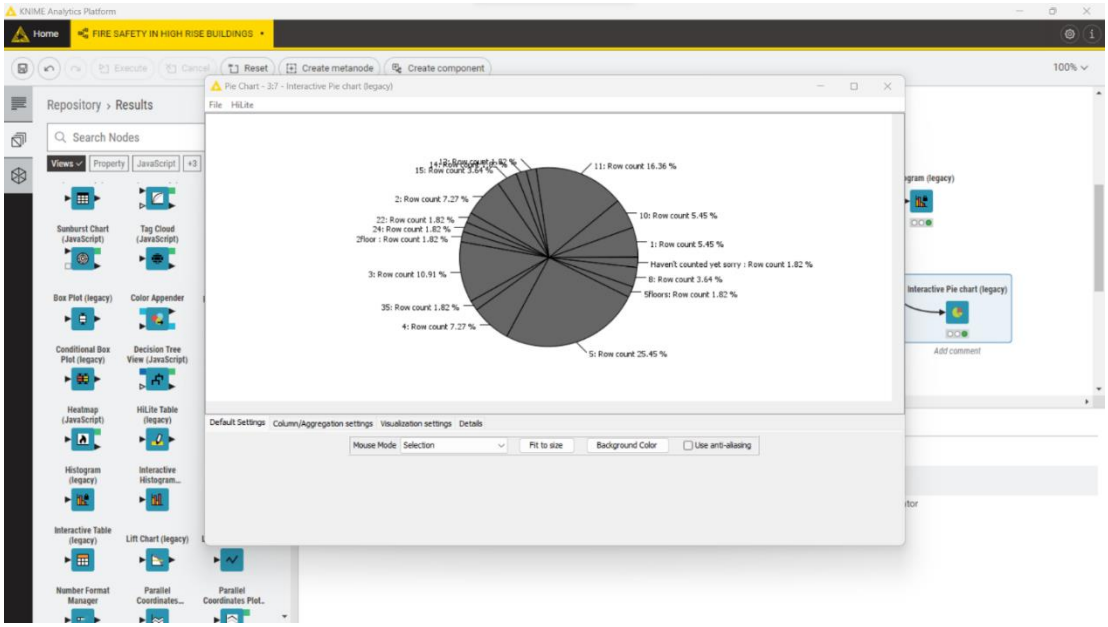


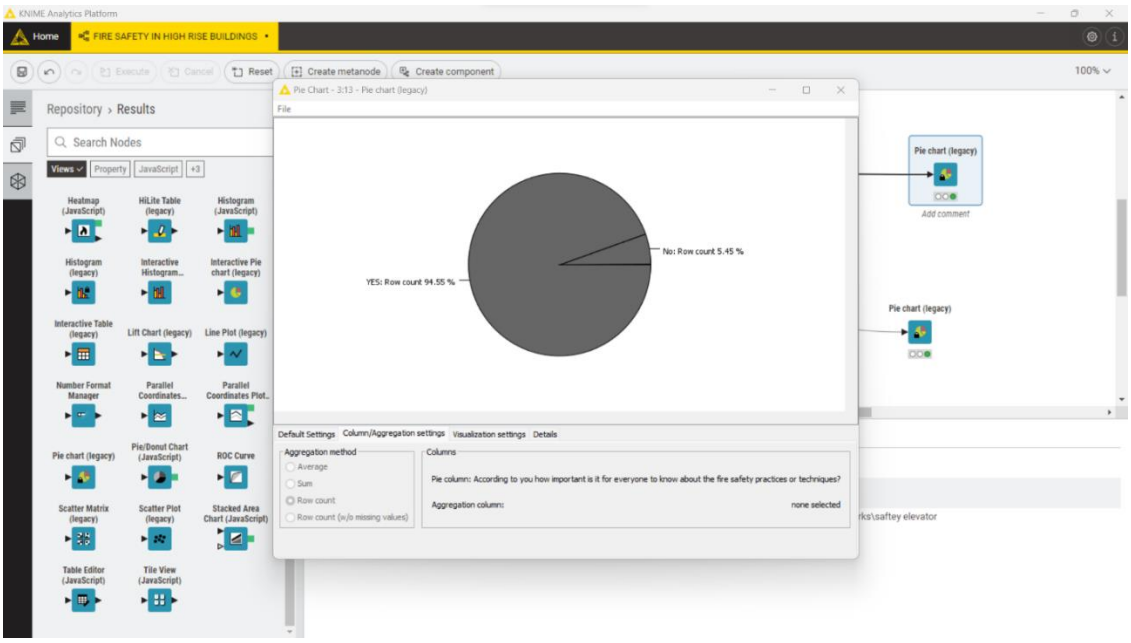
| Row ID | How m... | How m... | What is... | What pl... | Do you ... | Accordi... | What a... | Accordi... | Accordin... | Does y... | What is... | Email ID? |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8/29/2023 17:... | . | 3 | Fuel | 1 | YES | . | . | YES | all of the above | 1 | ? | ? |
| 8/29/2023 17:... | Null | 2 | Fuel | 5 | YES | Dried trees, ... | Water, cloth... | YES | all of the above | 1 | ? | ? |
| 8/29/2023 17:... | None | 5 | Oxygen | 5 | YES | Short circuit ... | Steps | YES | all of the above | 5 | ? | ? |
| 8/29/2023 17:... | 0 to my kno... | 5 | Oxygen | 5 | YES | Crackers | Using the st... | YES | all of the above | 4 | ? | ? |
| 8/29/2023 17:... | More than 25 | 5 | Fuel | 3 | YES | Lpg, fuel, ke... | None | YES | all of the above | 1 | ? | ? |
| 8/29/2023 17:... | No | 4 | Oxygen | 4 | YES | Short circuit | Co2 cylinder | YES | all of the above | 4 | ? | ? |
| 8/29/2023 18:... | Nil | 5 | Fuel | 5 | YES | Firewood,ga... | Walkways n ... | YES | all of the above | 2 | ? | ? |
| 8/29/2023 20:... | 0 | 2floor | Oxygen | 1 | YES | Gas cylinder... | Stairway | YES | all of the above | 1 | ? | ? |
| 9/21/2023 16:... | 25+ | 15 | Oxygen | 5 | YES | Electrical fail... | Water sprin... | YES | all of the above | 3 | ? | ? |
| 10/6/2023 15:... | more than 30 | 11 | Oxygen | 5 | YES | improper wir... | fire extingui... | YES | all of the above | 5 | sri sai | P2270340@... |
| 10/16/2023 1:... | 90/100 | 15 | Oxygen | 5 | YES | Open electri... | Water sprin... | YES | Stampede, su... | 5 | Teja Reddy | tejareddyvb.... |
| 10/18/2023 1:... | Zero | 5floors | Oxygen | 1 | YES | Trees | Fire exit | YES | all of the above | 5 | Kartheek re... | Kartheektdk... |
| 10/18/2023 1:... | No idea | 2 | CO2 | 4 | YES | Gas cylinder | Sprayer | YES | all of the above | 5 | Anwar Huss... | anwarannu9... |
| 10/18/2023 1:... | 10 | 1 | Oxygen | 3 | YES | Gas stove,el... | Nope | YES | all of the above | 1 | Srinadh Kotari | Kotarisrinad... |
| 10/23/2023 1:... | None | 5 | Oxygen | 1 | YES | Electricity | Fire extingui... | YES | all of the above | 1 | Pranavi | pranavicher... |
| 10/23/2023 1:... | 10 | 5 | Oxygen | 5 | YES | Chemicals, ... | Vacate build... | YES | all of the above | 4 | Merla Dines... | sathwik.mds.... |
| 10/23/2023 1:... | None | 5 | Oxygen | 5 | YES | Gas items, e... | Emergency ... | YES | all of the above | 5 | Jeevan | medepalljee... |
| 10/23/2023 1:... | 0 | 5 | Oxygen | 4 | YES | Flammable l... | exterior stai... | YES | all of the above | 1 | dinesh reddy | dineshreddy... |
| 10/23/2023 1:... | 6 | 5 | Oxygen | 5 | YES | Cylinders | Fire exits | YES | all of the above | 5 | Swetha | swethakanc... |
| 10/23/2023 1:... | Few | 2 | Oxygen | 5 | YES | Gas stove | None | YES | all of the above | 3 | Sruthi | Sruthi@gmai... |
| 10/23/2023 2:... | None | 4 | Fuel | 4 | YES | Gas leakage | None | YES | all of the above | 1 | Mahi | mahi181171... |
| 10/23/2023 2:... | 1-2 | 5 | Fuel | 5 | YES | Short circuit... | Emergency ... | YES | all of the above | 5 | Priya | priyateja95... |
| 10/24/2023 9:... | 100 | 11 | Oxygen | 5 | YES | Electric wires | Stairs | YES | all of the above | 4 | G V VARUN | varungadam... |
| 10/24/2023 1:... | 10 | 11 | Oxygen | 1 | YES | Wood, plasti... | Refuse area | YES | all of the above | 5 | NANDIGAM ... | Mahindrapat... |
| 10/24/2023 1:... | 28 | 35 | All | 1 | YES | Any combus... | Emergency ... | YES | all of the above | 5 | Narendrana... | narendrared... |
| 10/24/2023 1:... | Yes | 11 | Fuel | 4 | YES | Cylinder ga... | Emergency ... | YES | all of the above | 5 | Swetha Red... | swetha.ank... |
| 10/24/2023 1:... | Many | 11 | CO2 | 4 | YES | Electrical ap... | Refuge area... | YES | all of the above | 4 | Krishna | patangekris... |
| 10/24/2023 1:... | 77 | 22 | Oxygen | 3 | NO | Em und le | Dunukudam ... | YES | Stampede | 3 | Venkat Sai | Mahindra |
| 10/24/2023 1:... | More | 10 | CO2 | 4 | YES | Electronics a... | Fire exits | YES | all of the above | 4 | Vandana Ka... | kattasouriva... |
| 10/24/2023 1:... | Many | 11 | Oxygen | 3 | YES | No proper el... | . | YES | all of the above | 4 | SUPRIYA THUL | thulsupriya3... |
| 10/24/2023 1:... | 10+ | 8 | Oxygen | 5 | YES | Electrical co... | Refuge area... | YES | all of the above | 5 | Harshita Go... | gourkar.har... |
| 10/24/2023 1:... | 5 | 11 | Oxygen | 1 | YES | paper, woo... | Emergency ... | YES | all of the above | 3 | Smriti | smritijaiswal... |
| 10/24/2023 1:... | Infinite | Haven't cou... | Oxygen | 5 | NO | Ladies | Nothing | No | all of the above | 5 | Anonymous | anonymous... |
| 10/24/2023 1:... | 2 | 3 | Oxygen | 4 | YES | Garbage, Pl... | Assembly ar... | YES | all of the above | 3 | Sachin Joshi | joshisachin2... |
| 10/24/2023 1:... | 0 | 3 | Fuel | 4 | YES | Electricity lin... | Emergency ... | YES | all of the above | 3 | Suraj Surya... | suurajsurya.... |
| 10/24/2023 1:... | More than 20 | 5 | Oxygen | 4 | YES | Gas cylinder... | Balcony, sta... | YES | fire burns | 4 | Vijay Shinde | shindevijay3... |
| 10/24/2023 1:... | 4 | 5 | Oxygen | 5 | YES | Wiring, Heat... | None. | YES | all of the above | 3 | Sharma Kar... | dazzlingshar... |
| 10/24/2023 1:... | 4 | 5 | Oxygen | 1 | YES | Heating equi... | None | YES | all of the above | 3 | Burra Venka... | Karmanyash... |
| 10/24/2023 1:... | 10 | 11 | fire extingui... | 5 | YES | wooden art ... | by stairs, he... | YES | Stampede, su... | 3 | DEVBRAT SI... | P2270362@... |
| 10/24/2023 1:... | Many | 8 | CO2 | 5 | YES | Electrical eq... | Refugee are... | YES | suffocation | 5 | Aditya Desai | adityadesai.... |
| 10/24/2023 1:... | 20+ | 4 | Fuel | 5 | YES | Gas pipes | Fire exit | YES | all of the above | 5 | Aravind(Edi... | aravindmaji.... |
| 10/24/2023 1:... | 7-8 | 4 | both Fuel an... | 1 | YES | Chemicals, s... | locate a tre... | YES | all of the above | 5 | Dhananjay ... | dhananjay.... |
| 10/24/2023 1:... | Yes | 10 | Fuel | 3 | YES | ..... | No | YES | all of the above | 3 | Rupali | sugaverupal... |
| 10/24/2023 1:... | 3 | 3 | Oxygen | 5 | YES | Cylinder,ge... | None | YES | all of the above | 1 | Sharanya | - |
| 10/24/2023 1:... | 01 | 14 | Oxygen | 5 | YES | Gas leakage | Fire emerge... | YES | all of the above | 5 | Samrudh Patil | samrudhp06... |
| 10/24/2023 1:... | 12 | 24 | CO2 | 4 | YES | Electric lines | Fire alarm | YES | all of the above | 5 | Krishna | mishrak2511... |
| 10/24/2023 1:... | 8 | 12 | Fuel | 1 | YES | Electric shor... | Fire extingui... | YES | all of the above | 5 | Abhinav | abhinavcha... |
| 10/24/2023 1:... | 3 | 3 | Oxygen | 1 | YES | Na | Exit door | YES | all of the above | 4 | Nikita patil | nikhitapatil4... |
| 10/24/2023 1:... | 10 | 10 | Oxygen | 2 | YES | Lpg cylinders | Using fire ex... | YES | all of the above | 1 | Nidhi Pandit | nidhipandit2... |
| 10/24/2023 1:... | 0 | 1 | Fuel | 5 | YES | Chemicals, ... | Fire brigade | No | all of the above | 3 | Sugave Rutuja | rutujasugav... |

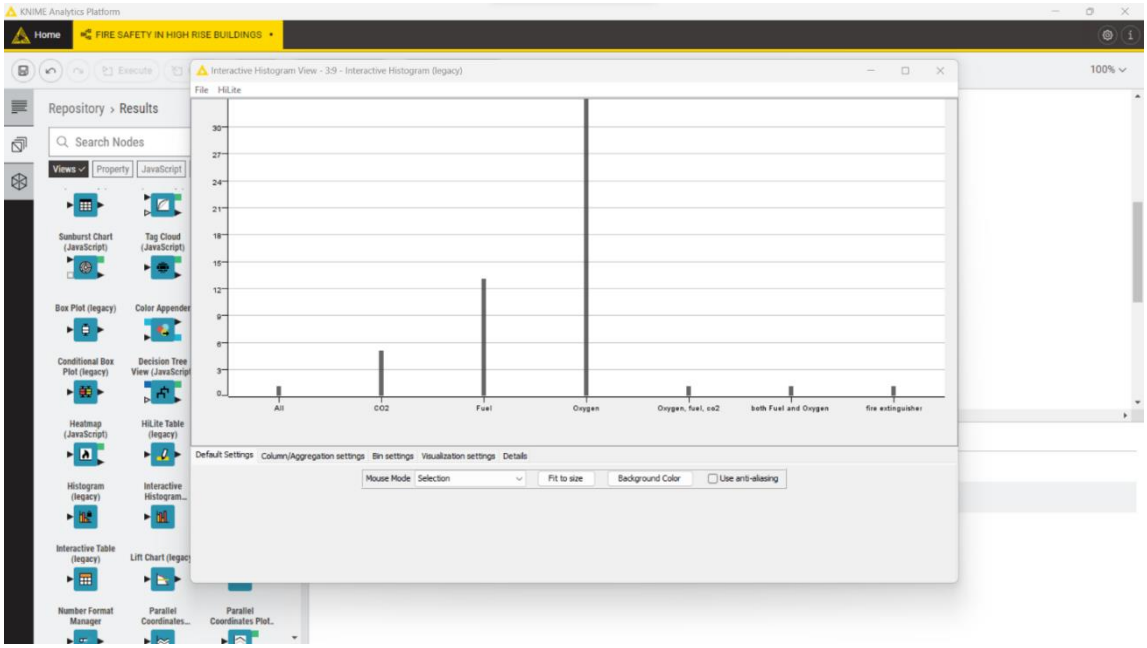


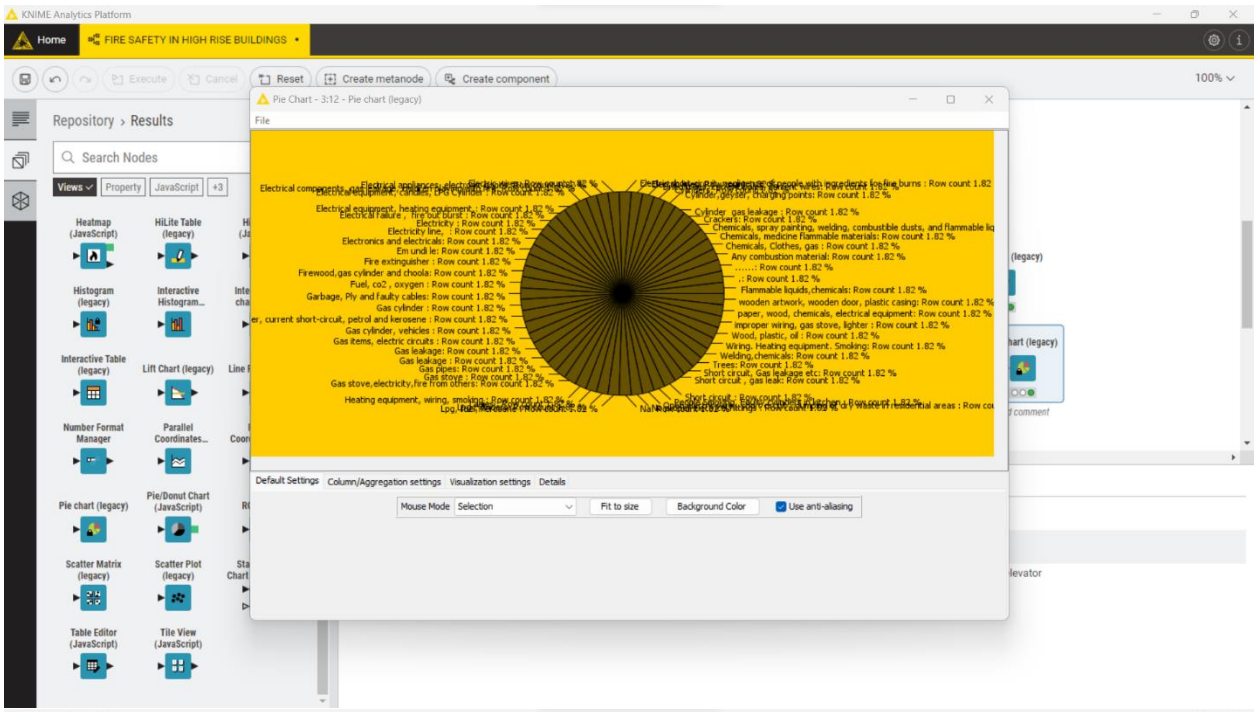



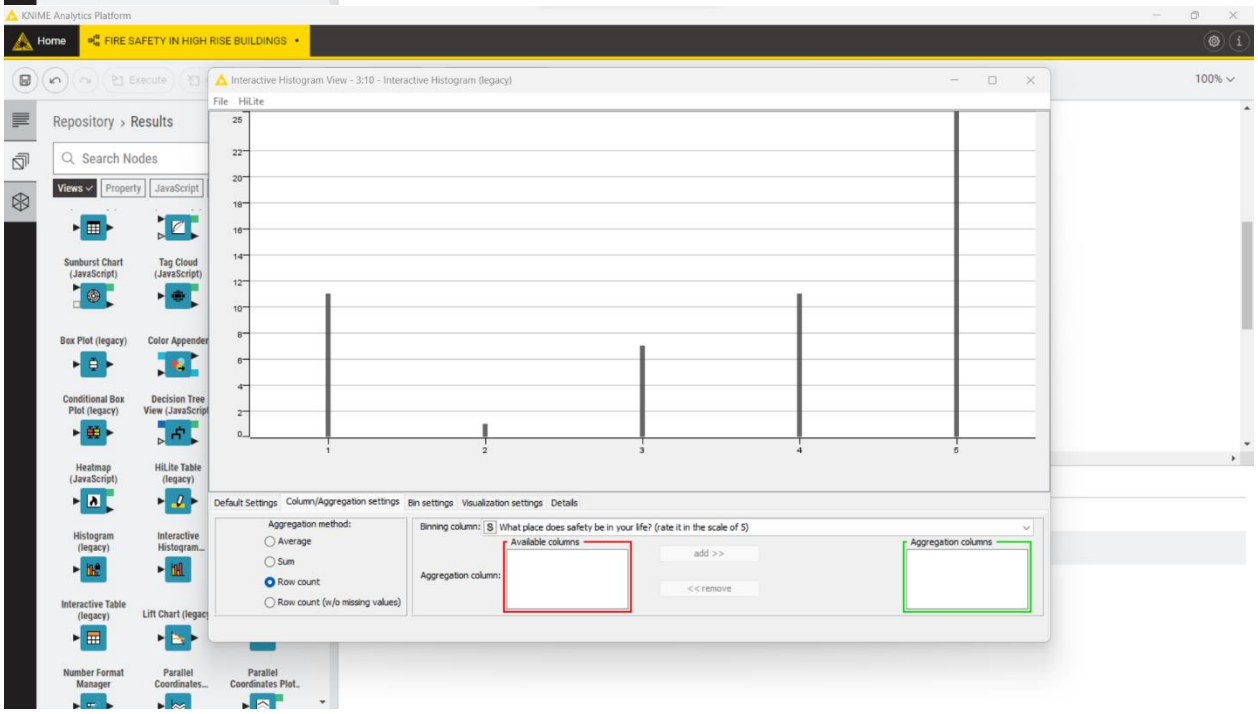

KNIME Analytics Platform
Home
FIRE SAFETY IN HIGH RISE BUILDINGS
Execute
Cancel
Reset
Create metanode
Create component
100%
Repository › Results
Search Nodes
Views
Property
JavaScript
Conditional Box Plot (legacy)
Decision Tree View (JavaScript)
Heatmap (JavaScript)
HiLite Table (legacy)
Histogram (legacy)
Interactive Histogram...
Interactive Table (legacy)
Lift Chart (legacy)
Number Format Manager
Parallel Coordinates...
Pie chart (legacy)
Pie/Donut Chart (JavaScript)
Scatter Matrix (legacy)
Scatter Plot (legacy)
Stacked Area Chart (JavaScript)
Pie Chart - 3:6 - Interactive Pie chart (legacy)
File
HiLite
10: Row count 9.09 %
1-2: Row count 1.82 %
0: Row count 10.91 %
4: Row count 3.64 %
5: Row count 1.82 %
6: Row count 1.82 %
7-8: Row count 3.64 %
Yes: Row count 3.64 %
Null: Row count 1.82 %
None: Row count 7.27 %
Default Settings
Column/Aggregation settings
Visualization settings
Details
Mouse Mode
Selection
Fit to size
Background Color
Use anti-aliasing
Line Plot (legacy)
Add comment


KNIME Analytics Platform
Home
FIRE SAFETY IN HIGH RISE BUILDINGS
Reset
Create metanode
Create component
100%
Repository › Results
Search Nodes
Views
Property
JavaScript
Sunburst Chart (JavaScript)
Tag Cloud (JavaScript)
Box Plot (legacy)
Color Appender
Conditional Box Plot (legacy)
Decision Tree View (JavaScript)
Heatmap (JavaScript)
HiLite Table (legacy)
Histogram (legacy)
Interactive Histogram...
Interactive Table (legacy)
Lift Chart (legacy)
Number Format Manager
Parallel Coordinates...
Parallel Coordinates Plot...
Pie Chart - 3:7 - Interactive Pie chart (legacy)
File
HiLite
11: Row count 16.36 %
2: Row count 7.27 %
10: Row count 5.45 %
1: Row count 5.45 %
Haven't counted yet sorry : Row count 1.82 %
8: Row count 3.64 %
5floors: Row count 1.82 %
3: Row count 10.91 %
35: Row count 1.82 %
4: Row count 7.27 %
5: Row count 25.45 %
Default Settings
Column/Aggregation settings
Visualization settings
Details
Mouse Mode
Selection
Fit to size
Background Color
Use anti-aliasing
Interactive Pie chart (legacy)
Add comment


KNIME Analytics Platform
Home
FIRE SAFETY IN HIGH RISE BUILDINGS
Repository › Results
Search Nodes
Pie Chart - 3:13 - Pie chart (legacy)
YES: Row count 94.55 %
No: Row count 5.45 %
Pie chart (legacy)
Add comment
Default Settings
Column/Aggregation settings
Visualization settings
Details
Aggregation method
Average
Sum
Row count
Row count (w/o missing values)
Columns
Pie column: According to you how important is it for everyone to know about the fire safety practices or techniques?
Aggregation column:
none selected


KNIME Analytics Platform
Home
FIRE SAFETY IN HIGH RISE BUILDINGS
Repository › Results
Search Nodes
Interactive Histogram View - 3:9 - Interactive Histogram (legacy)
File
HiLite
All
CO2
Fuel
Oxygen
Oxygen, fuel, co2
both Fuel and Oxygen
fire extinguisher
Default Settings
Column/Aggregation settings
Bin settings
Visualization settings
Details
Mouse Mode
Selection
Fit to size
Background Color
Use anti-aliasing


KNIME Analytics Platform
Home
FIRE SAFETY IN HIGH RISE BUILDINGS
Reset
Create metanode
Create component
Repository › Results
Search Nodes
Views
Property
JavaScript
Pie Chart - 3:12 - Pie chart (legacy)
File
Default Settings
Column/Aggregation settings
Visualization settings
Details
Mouse Mode
Selection
Fit to size
Background Color
Use anti-aliasing


KNIME Analytics Platform
Home
FIRE SAFETY IN HIGH RISE BUILDINGS
Repository › Results
Search Nodes
Views
Property
JavaScript
Interactive Histogram View - 3:10 - Interactive Histogram (legacy)
File
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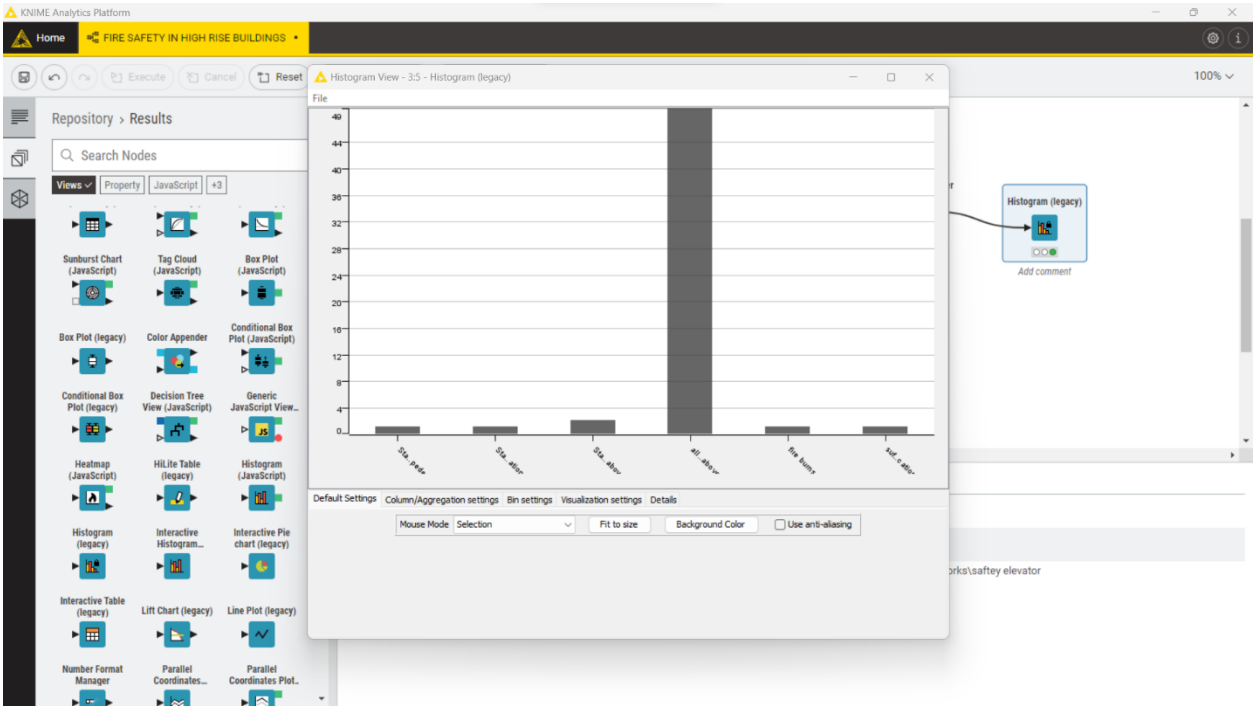
Default Settings
Column/Aggregation settings
Bin settings
Visualization settings
Details
Aggregation method:
Average
Sum
Row count
Row count (w/o missing values)
Binning column:
What place does safety be in your life? (rate it in the scale of 5)
Available columns
Aggregation column:
add >>
<< remove
Aggregation columns




According to the survey we got to know that there is huge rate of growth of Highrise structures. And in which there are a major reason for a sudden fire outbreak so, it is seen necessary for a fire evacuation plan. As wise there is large amount of technological advancement in terms of fire evacuation systems. So, by taking this into consideration we had came up with the idea of a mass evacuating system.

**PROBLEM STATEMENT:**

The modern world is full of development in terms of each and every aspect likewise infra structures were growing in order to ease the problem of living for the growing population. But mainly many of us are going for the construction of Highrise building in order to minimize the use of large number of land areas but these high-rise buildings have their own pros and cons. One of the main problems that we had chosen is of a fire outbreak. According to recent years studies it is found that there is huge amount human loss, causalities were caused due to fire outbreak. But as observed that the loss of human or injuries are caused mainly due to suffocation and stampede. Although we provide with proper ventilation and proper evacuation system it is observed that due to the sudden change in human behavior due to panic attack there caused a great human loss or even say human injuries.

**METHODOLOGY:**

Generally, if we go through the past cases of fire outbreak, we can find that maximum deaths are caused due to the stampeded and suffocation. So, to ease this problem we came with a solution of mass evacuation system URBAN SAFESCAPE Where we can evacuate a large group of men at a time.

Before going deep into we have first know the answers of these three terms what? Why? And how?

What?

We are giving a solution for the situation where we face a huge life loss due to lack of escape situation.

Why?

Such that by using this method we can achieve a mass evacuation in which we can evacuate a huge amount of people at the same time.

How?

Let us consider a building having 15 floors which is a residential type

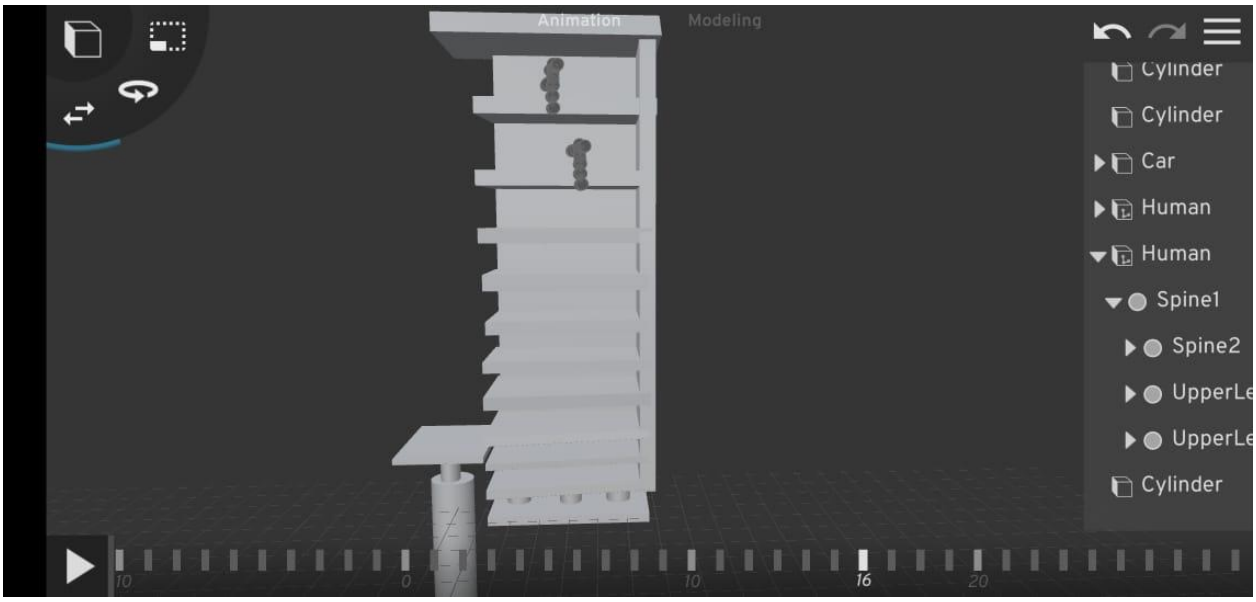
Methodology to ease this problem:

The idea or proposal of this paper mainly consists of an evacuating system that can be used at the time of sudden fire outbreak. By using this system, we can go for a mass evacuation by using an elevating ramp. At first let us see the materials used in each part of the system:

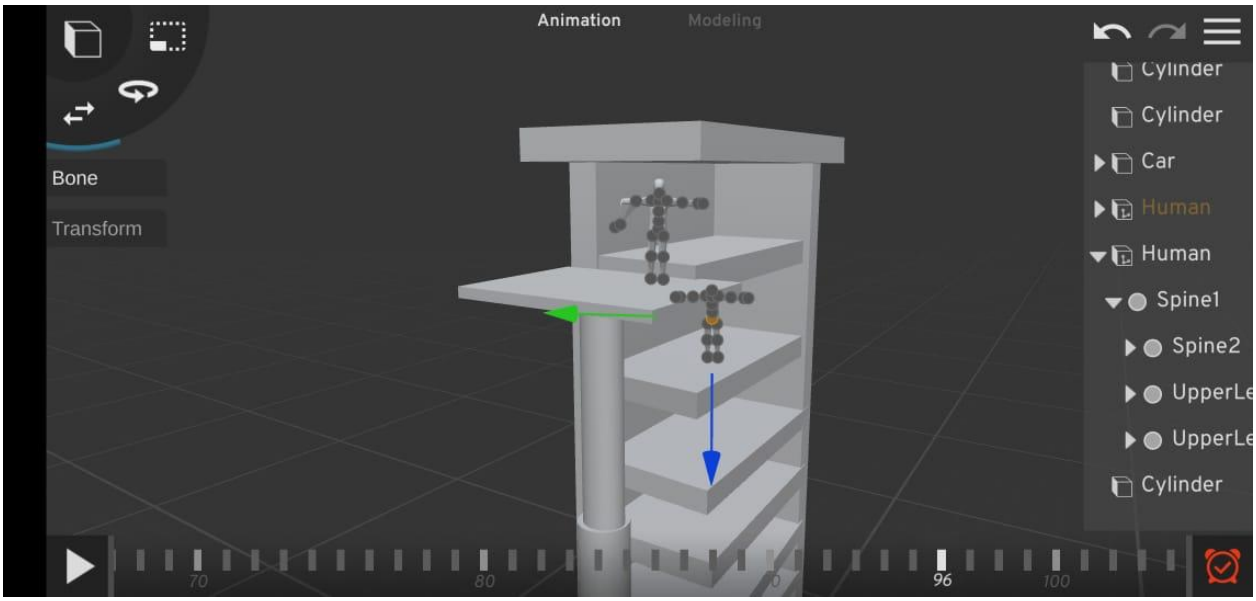
- Ramp made of MS steel
- Railings made of low weighted aluminum
- And at last, the main operating system the hydraulic system

So, the system is first designed by taking 10 floors as the basic height that is of 110 feet from the ground level. The system has a customization nature which can be made appropriate to the need of user. And coming to the use part the ramp is designed for around 20 people at one go.
The system is first joined and made into one whole body which consists of 6 hydraulic machines on which MS ramp is mounted and then this system is provided with a flexible railing which when required comes out at the time of operation. The system is at first compressed and placed in a place where there is an easy access for evacuation then by using spring principles the rails are also submerged in the ground. The system is then given an electric touch up such that we can operate it from a distance. So, when fire outbreak occurs then by using switch the system can be started and we can also control the altitude of ramp.

Designed equipment (through animation using prisma 3D):


Animation
Modeling
Cylinder
Cylinder
Car
Human
Human
Spine1
Spine2
UpperLe
UpperLe
Cylinder
30
40
50
60
65


Animation
Modeling
Bone
Transform
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Cylinder
Car
Human
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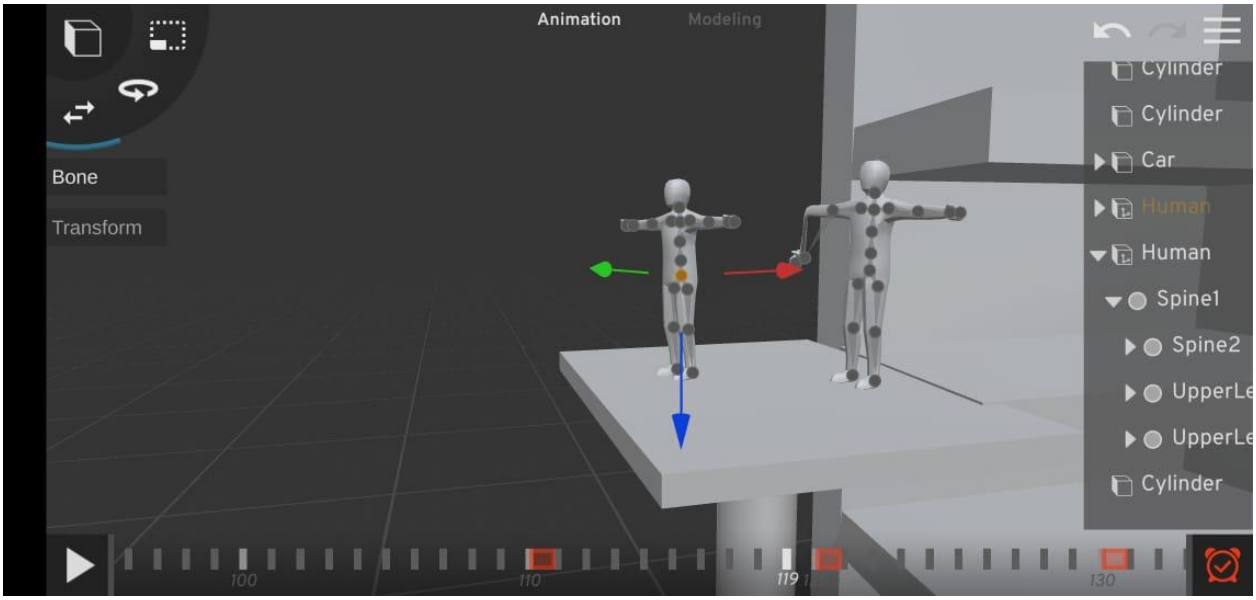
Cylinder
70
80
96
100


Animation
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Bone
Transform
Cylinder
Cylinder
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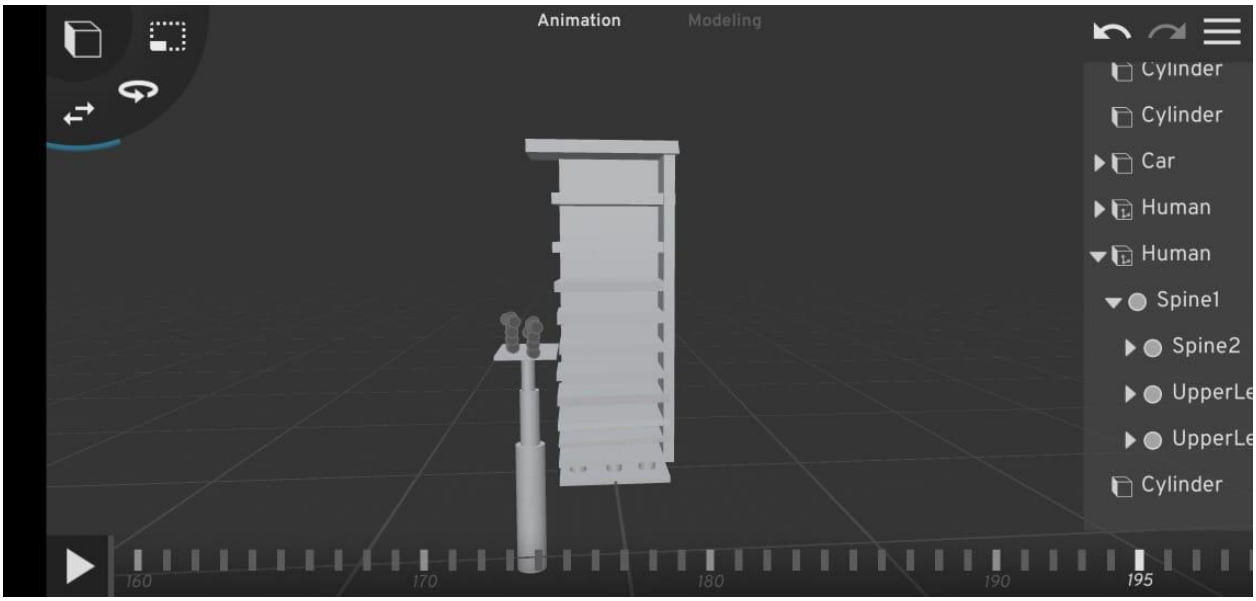
Spine1
Spine2
UpperLe
UpperLe
Cylinder
100
110
119
130


Animation
Modeling
Cylinder
Cylinder
Car
Human
Human
Spine1
Spine2
UpperLe
UpperLe
Cylinder
160
170
180
190
195


Animation
Modeling
Cylinder
Cylinder
Car
Human
Human
Spine1
Spine2
UpperLe
UpperLe
Cylinder
100
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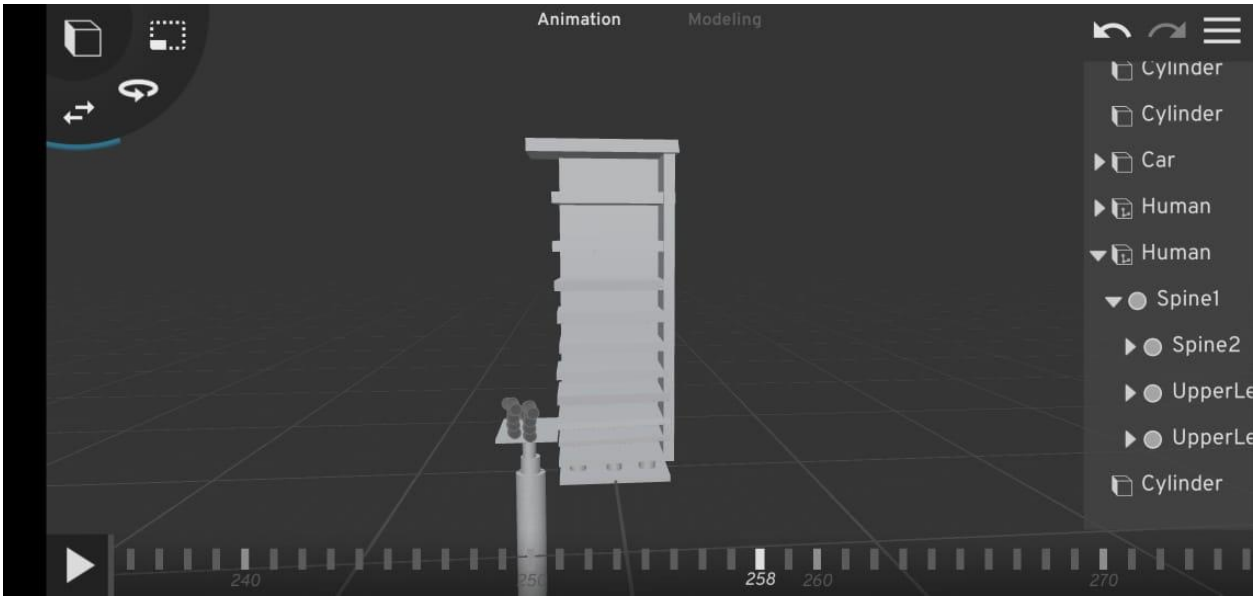
120
130


Animation
Modeling
Cylinder
Cylinder
Car
Human
Human
Spine1
Spine2
UpperLe
UpperLe
Cylinder
240
258
260
270

**BASIC CALCULATIONS:**

Different materials that can be used: -

a) Block immersed: - (along with thermocol for layering)

Density: $1.42g/cm^3$

$=1.42(100)^3/1000$

$=1420kg/m^3$

$1kg=1000g/(100)^3cm^3$

Where L=3m , b=2m

$w_{bi}$=0.32 and $w_T$=0.12

Thermocol:

Density=8.40x0.72

=6.048kg

$m_{bi}$=DxV

=1420x (3x2x0.32)

=27264kg

$m_t = D$xV

=8.40x0.72

=6.048kg

Total $m_r$=2732.448kg

Where, WBI=thickness of one black iron used layer

$w_T$ =thickness of one black iron thermocol layer

$m_{bi} = mass\ o$f total black iron used layers

$m_t$= mass of total thermocol layers

$m_r$= mass of ramp

$b$) Small south American tree (Along with thermocol for layering)

Density=$0.98g/cm^3$

$m_r$=8030x0.6

=4,818kg

Dead load of each material is shown as: where, p=load

m=mass, a=acceleration due to gravity

a) Black iron used=

P=m x A,

p=2732.448x10

P=27324.48kgm/$s^2$

b) Small south American tree=

P= m x A

=1887.648x10

=18876.48kg/$s^2$

c) Galvanized Steel=

P=mxa

=4680x10

=46800kgm/$s^2$

d)Electro galvanized steel=

p=4818x10

=48180$kg/s^2$

= $(0.98x(100)^3)/1000$

=980$kg/m^3$

$D_t$ = Thermocol density=8.40kg/$m^3$

$M_{SSAT} = 980X1.92 = 1881.6$ =mass of lossed

$M_T = 6.048\ kg$

$M_R = 188.8\ kg$

c) M.S steel: (galvanized steel)

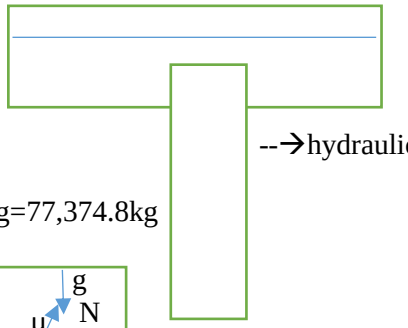
density= $7.8g/cm^3$

$=\frac{7.8X(100)^3}{1000}$

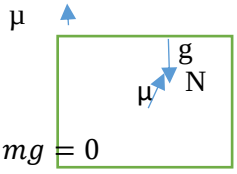
=7800kg/$m^3$ where: L=3m b=2m

T=0.1m

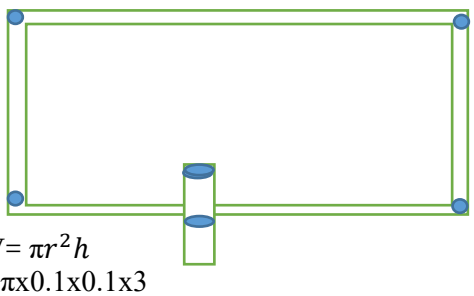
V=3x2x0.1=0.6
$C$DxV
$= 7800x0.6$
$= 4{,}680kg$
$d$) ms steel (electro galvanized steel)
$D$=8.03$g/cm^3$
=8.03x$(100)^3$/1000
=8030$kg/m^3$
$V = 3X2X0.1 = 0.6$
$V2^h$=0.2516
$V_{Total}$=0.5036
total v of railing=$V_{(total)(h)}$+$V_{(total)(b)}$
=0.5036+0.6288
=1.1324$m^3$
D=2.7x$100^3$/1000
=2700
m=DxV
=2700x1.1324
=3057.48kg
W=30574.8$kgm/s^2$
Total load of Ramp + Railing: -
i) Block wood: -
=57,899.28kg$m/s^2$
ii) small south American tree:
=49,451.28$m/s^2$
iii) galvanized steel: -
=77,374.8kg$m/s^2$
Total force required by the hydraulic machines to lift the ramp
For time being we are considering all 6 machines as a whole for easy calculations




Ramp + Railing=77,374.8kg




$F_\mu - mg = 0$
$= F_\mu$-FRR=0
$= F_\mu$=FRR
$F_\mu$ =77,374.8
None $F_\mu$ is divided into 6 equal parts 77,374.8
Railing material aluminum:
D=2.7$g/cm^3$




V= $\pi r^2 h$
=πx0.1x0.1x3

=0.0942
v=$\pi r^2 h$
=πx0.7x0.7x1
=0.0315$m^3$
Total=vXd=0.126
v1x2=0.1884
v2x2=0.3768
v2=2*total v of one face=0.252
vtotal= 0.628

r=0.1m, r=0.1m
h=2m
v=$\pi r^2 h$
=$\pi(0.1)(0.1)(2)$
=0.0629
=0.0629
V1=vx2=0.1258
h=1m
v1=0.126
v1*2=V2=0.252
iv)electro galvanized total:
=78, 7548.kgm

Here we had considered different martials only to compare their properties and with stand capacity after comparing we concluded that galvanized steel is the material +aluminum is the ramp material to be used.
Total load of profile: 20 profiles are considered for one go a
random sample of there weights are taken they are:
75,95,70,60,90,45,62,55,50,150,86,76,100,40,79,85,54,120,72
Mean (Average weight that can be)
=sum of all no/no of samples=76.45kg
Total weight=1529kg
F=ma
=1529x10
=1520kgm/$s^2$
$f_h$=12,8958kgm/$s^2$ it is the force is required by each hydraulic machine for dead load
When load added then

$6f_h$=926648
=15,444.133kgm/$s^2$

$Fh_l$- $Fh_{dl}$/$Fh_l$=0.165
= 16.5% more force have to be by the hydraulic machine when load added.

**CONCLUSION:**
So, after conducting the survey we had came to the conclusion that high rise structures have been becoming a boom. Its is observed that there is a high rate of risk caused due to fire outbreaks. based on the studies, surveys conducted it has observed that fire safety is a years old practices that have been followed in order to save the livelihood. As this paper suggest a new and effective way of saving a large group of people in an attempt to save everyone. The system is constructed at the early construction phase. And the system will be a kind of invisible by which it is hard for the naked eyes to detect in order to safe guard the beauty of the structure. The system is controlled by a hydraulic machine by using which we can attain the height at which the system has to reach. This system is designed for a vertical range of 10 floors and with a capacity of 20 people. So, by this simple hydraulic operated ramp we can go for an effective evacuation of a large group of people. And it is observed that there is a great advancement of technology in the field of fire safety. By doing further studies we can design for higher heights with better capacity and better efficiency. And the system is flexible in terms of design that means we can design with respective to the design and space of the building in which it has to be installed.

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