AMERICAN INTERNATIONAL UNIVERSITY–BANGLADESH (AIUB)

FACULTY OF SCIENCE & TECHNOLOGY

DEPARTMENT OF COMPUTER SCIENCE

COMPUTER GRAPHICS

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Section: D, Group: 05

Project Title: Futuristic City View & Smart Fire Management System

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Introduction

The title of our project is 'Futuristic City View & Smart Fire Management System'. In this project we tried to implement the view of how a futuristic city will be look like and how will be the fire management system in future. There are three scenarios in the project. The first scenario is of a city where we have the next version of all the components of a city like futuristic bullet trains, cars, and buildings. There is underground train station. Also there are futuristic cars and smart cars as well. Animated ballons moving in the sky is also designed. Robots will be used very often in the future. So , there are some robots in the first scenario in the underground train station. We added animations to these objects in order to look more realistic. Then we will have the second scenario. In the second scenario, we designed a futuristic Fire Station. We replicated the view of the next version fire station. There are be vehicles such as fire trucks and helicopters in the fire station. Again there is animation in the scenario. Then we will have our third scenario. The third scenario is also a scenario of a modern futuristic city. However, the design and components of the third scenario is completely different from the first scenario. In the third scenario there are smart cars, modern bullet train, and modern buildings. There are also futuristic flying car. Moving animation is also added to all of the objects. Flower with leaf's moving is also designed in this scenario. This looks so realistic. The main part of this scenario is that one of the buildings will get fire. To extinguish the fire, A helicopter will come from the fire station and will begin to extinguish the fire with rain effect. So, in this scenario, fire effect, automatic helicopter movement, rain effect is used. The main objective of our project is to replicate a futuristic city view and to show the view of how the fire management system will look in the near future.

Technologies used

We used opengl to create the entire project. We used different features of Opengl like lines, polygon, circle drawing, moving animations, rotation animation. We used Geogebra online graphing tool to graph the entire project. We took help from some of the online websites like freepik, Shutterstock to search for vectors and designs. BMP pictures and textures are also used in the project.

Project Graph

Third Scenario
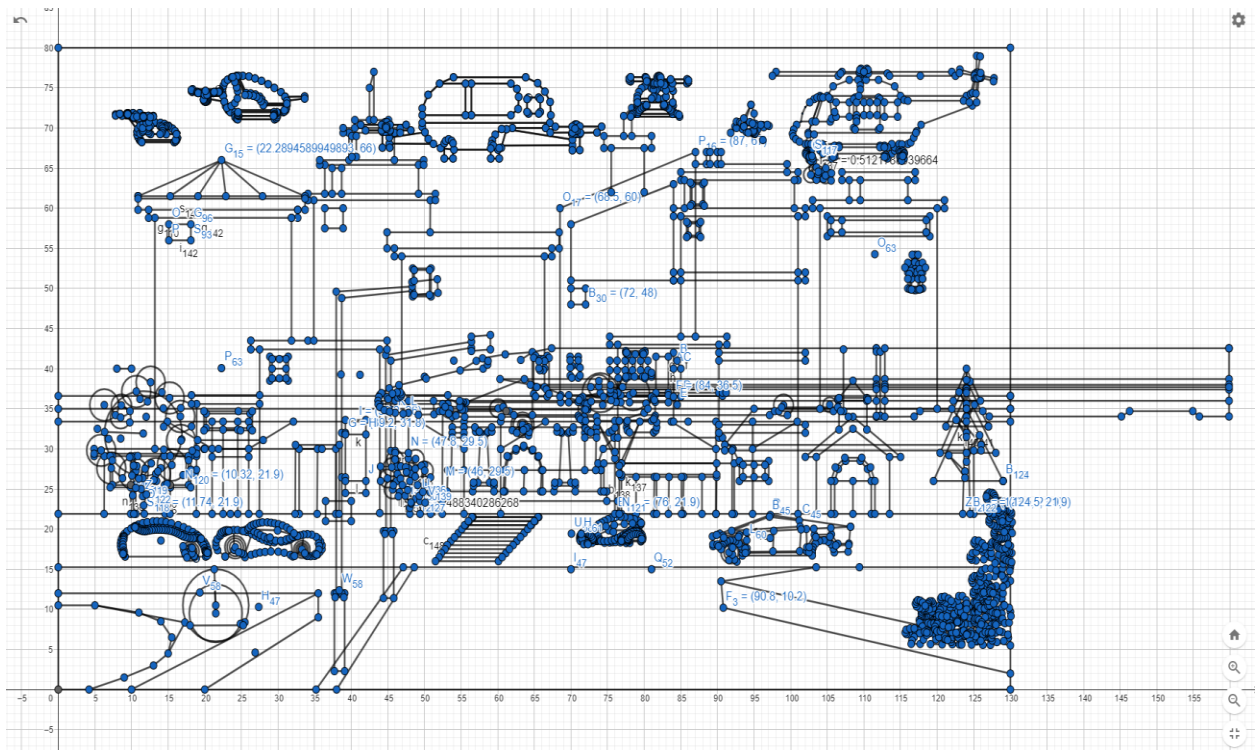
Intro page:
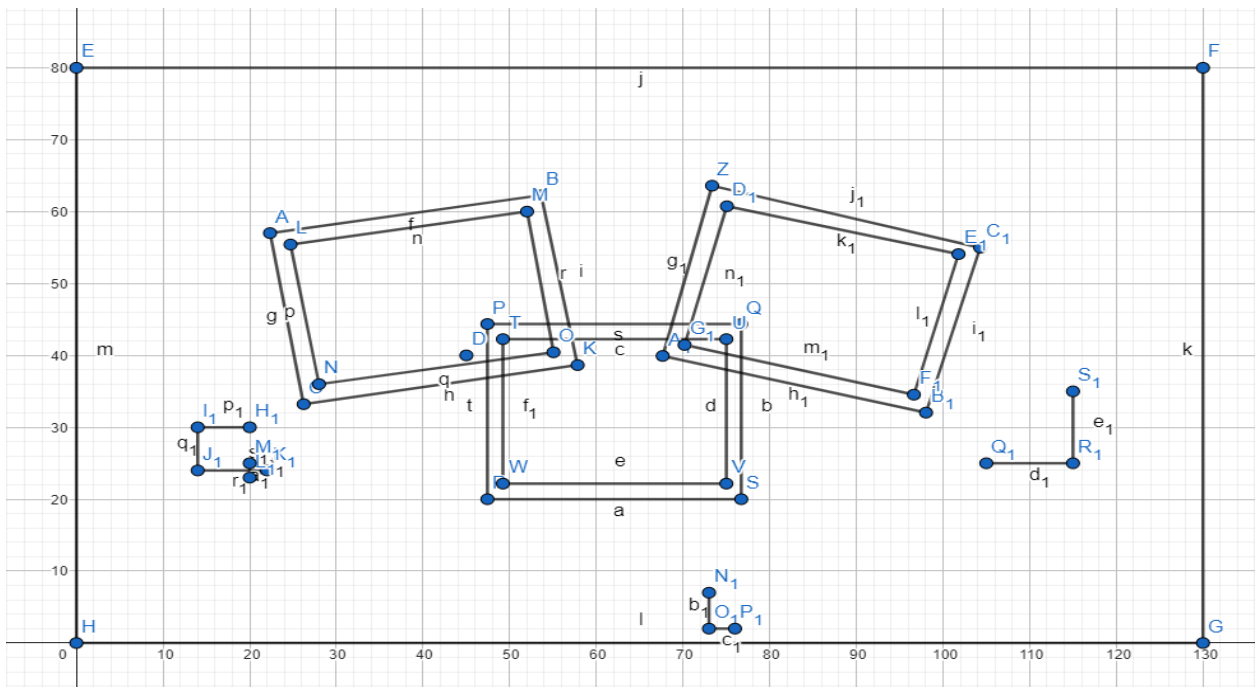
List of Objects

SL#	Object ID	Object Name
1	ID – 01	left_pond
2	ID – 02	front_road
3	ID – 03	side_green_area
4	ID – 04	poll_first
5	ID – 05	poll_second
6	ID – 06	road
7	ID – 07	drawRain
8	ID – 08	ciecle
9	ID – 09	train_platform
10	ID – 10	train_piller01
11	ID – 11	train_piller02
12	ID – 12	train_piller03
13	ID – 13	train_piller04
14	ID – 14	train01
15	ID – 15	train02
16	ID – 16	train03
17	ID – 17	building _01
17	ID – 18	building _02
19	ID – 19	building _03
20	ID – 20	building _04
21	ID – 21	building _05
22	ID – 22	building _06
23	ID – 23	building _07
24	ID – 24	building _08
25	ID – 25	building _09
26	ID – 26	building _10

27	ID – 27	building _11
28	ID – 28	sky
29	ID – 29	flying_car_01
30	ID – 30	flying_car_02
31	ID – 31	flying_car_03
32	ID – 32	flying_car_04
33	ID – 33	bird01
34	ID – 34	bird02
35	ID – 35	bird03
36	ID – 36	bird04
37	ID – 37	bird05
38	ID – 38	tree_01
39	ID – 39	tree_02
40	ID – 40	tree_03
41	ID – 41	tree_04
42	ID – 42	tree_05
43	ID – 43	tree_06
44	ID – 44	tree_07
45	ID – 45	tree_08
46	ID – 46	tree_09
47	ID – 47	trees_back_tree01
48	ID – 48	upper_road_area
49	ID – 49	cybertruck_01
50	ID – 50	eco_car02
51	ID – 51	auto_motorcycle03
52	ID – 52	eco_car04
52	ID – 53	left_pond_upper
54	ID – 54	flower_right_grass
55	ID – 55	helicopter

56	ID – 56	fire_show
57	ID – 57	fire
58	ID – 58	smoke_fire_all
59	ID – 59	fire_smoke
60	ID – 75	Opipic
61	ID – 76	Rafipic
62	ID – 77	Tishatpic
63	ID – 78	Back_texture

List of Functions:

SL#	Object Name	FunctionName
1	left_pond	left_pond()
2	front_road	front_road()
3	side_green_area	side_green_area()
4	poll_first	poll_first()
5	poll_second	poll_second()
6	road	road()
7	drawRain	drawRain()
8	ciecle	ciecle()
9	train_platform	train_platform()
10	train_piller01	train_piller01()
11	train_piller02	train_piller02()
12	train_piller03	train_piller03()
13	train_piller04	train_piller04()
14	train01	train01()
15	train02	train02()
16	train03	train03()
17	building_01	building_01()
17	building_02	building_02()
19	building_03	building_03()
20	building_04	building_04()
21	building_05	building_05()
22	building_06	building_06()
23	building_07	building_07()
24	building_08	building_08()
25	building_09	building_09()

26	building _10	building _10()
27	building _11	building _11()
28	sky	sky()
29	flying_car_01	flying_car_01()
30	flying_car_02	flying_car_02()
31	flying_car_03	flying_car_03()
32	flying_car_04	flying_car_04()
33	bird01	bird01()
34	bird02	bird02()
35	bird03	bird03()
36	bird04	bird04()
37	bird05	bird05()
38	tree_01	tree_01()
39	tree_02	tree_02()
40	tree_03	tree_03()
41	tree_04	tree_04()
42	tree_05	tree_05()
43	tree_06	tree_06()
44	tree_07	tree_07()
45	tree_08	tree_08()
46	tree_09	tree_09()
47	trees_back_tree01	trees_back_tree01()
48	upper_road_area	upper_road_area()
49	cybertruck_01	cybertruck_01()
50	eco_car02	eco_car02()
51	auto_motorcycle03	auto_motorcycle03()
52	eco_car04	eco_car04()
52	left_pond_upper	left_pond_upper()
54	flower_right_grass	flower_right_grass()

55	helicopter	helicopter()
56	fire_show	fire_show()
57	fire	fire()
58	smoke_fire_all	smoke_fire_all()
59	fire_smoke	fire_smoke()
60	fire_smoke()	Opipic()
61	Opipic	Rafipic()
62	Rafipic	Tishatpic()
63	Tishatpic	Back_texture()

List of Animation Functions

SL#	Animation Function ID	Animation Function	Object/Scene
1	ID - 61	Change_wing	Birds wing change
2	ID – 62	fly	Birds flying
3	ID – 63	_move_train	Train movement
4	ID – 64	wave_fire	Fire particle parts moving
5	ID – 65	zoom_fire	Fire particle zooming
6	ID - 66	fire_animatoin	fire particle appearing and vanishing
7	ID – 67	rotate_fan1	helicopter, flying cars

8	ID – 68	move_helicopter	Helicopter moving
9	ID – 69	update	Rain /water effect
10	ID - 70	move_flying_car	Flying cars
11	ID - 71	move_fire_smoke	Smoke of fire moving
12	ID - 72	move_jungle_leaf	Flowers and leaf move animaton
13	ID - 73	move_cars	Cars moving
14	ID - 74	zoom_to_fire_animation	zoom to fire and building 11
15	ID - 75	kepress_handle	Keyboard press interaction
16	ID – 79	zoom_to_normal_view	zoom to normal view of intro page
17	ID - 80	keyborard_func	Keyboard press interaction of intro page

Conclusion

In conclusion, our project "Futuristic City View & Smart Fire Management System" successfully illustrates a visionary outlook on urban development and emergency response systems. The first scenario provides a glimpse into the daily life of a futuristic city, highlighting innovations such as bullet trains, smart cars, and the widespread use of robots. The second scenario showcases the evolution of fire stations, equipped with state-of-the-art vehicles and preparedness to tackle emergencies efficiently. Scenario three provides a vivid representation of a modern futuristic city, emphasizing advanced technologies and their integration into urban life. The highlight of scenario three is the smart fire management system, which showcases the efficiency and responsiveness of future emergency services. The dynamic interaction between fire particles and the automated helicopter illustrates a sophisticated and adaptive approach to firefighting. The helicopter's rain

effect to extinguish the fire not only demonstrates advanced technology but also emphasizes the importance of quick and effective emergency response in future cities. Utilizing OpenGL for creating animations and designs, along with tools like Geogebra for graphing, we have ensured a high level of detail and interactivity in our project. The use of BMP pictures and textures along with wav files for sound effect has further enhanced the visual appeal and realism of third scenario in fact the whole project.

Overall, this project not only serves as a conceptual model for futuristic city planning and fire management but also highlights the potential of current technology to shape the cities of tomorrow. We hope this project inspires further exploration and development in urban innovation and emergency response systems.
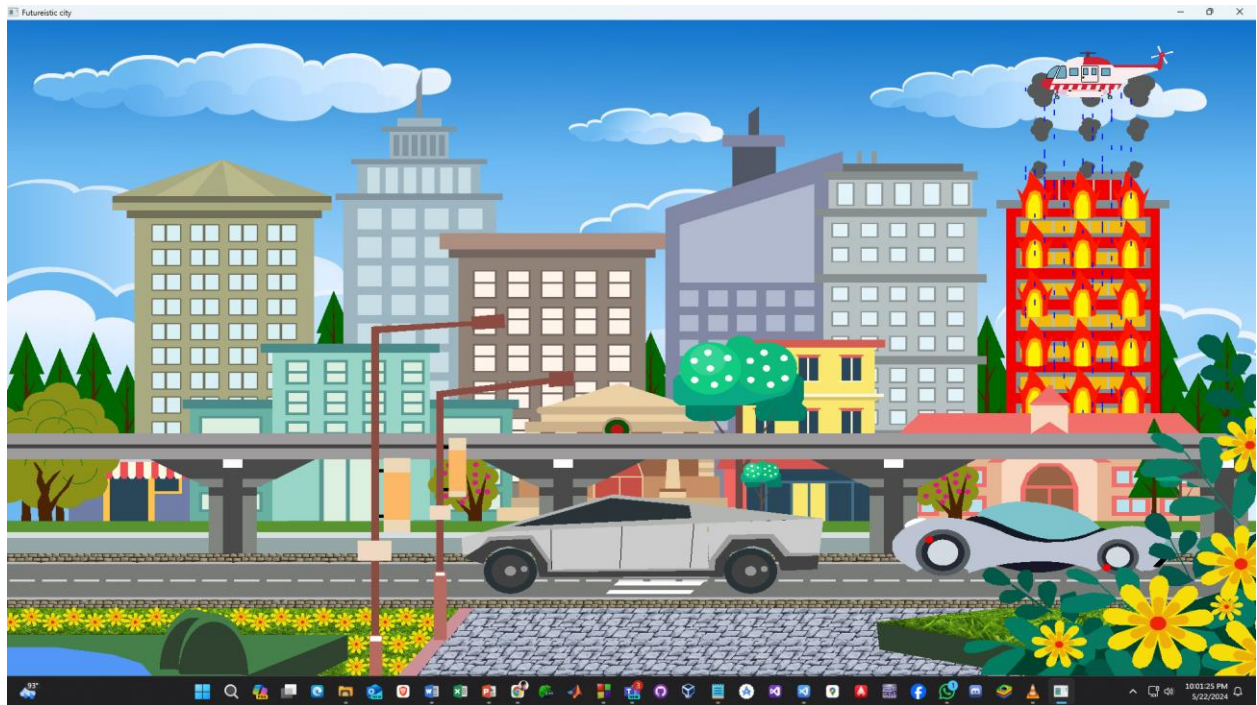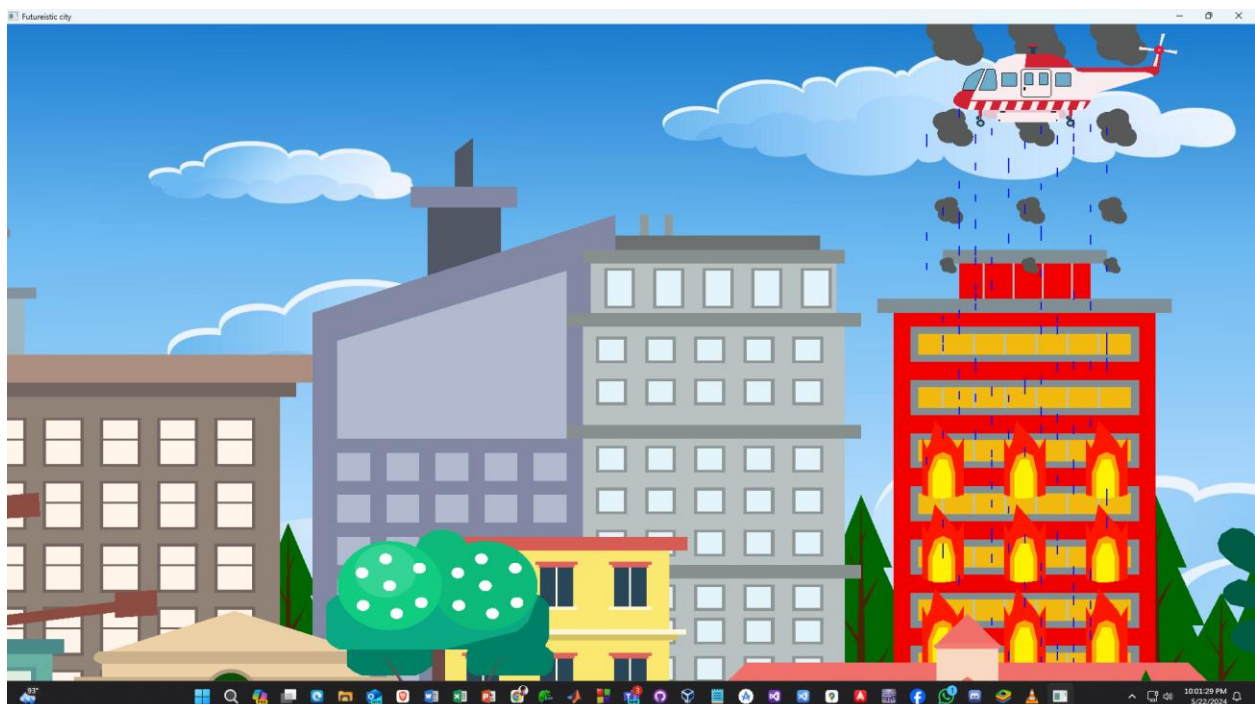
Output Screenshots
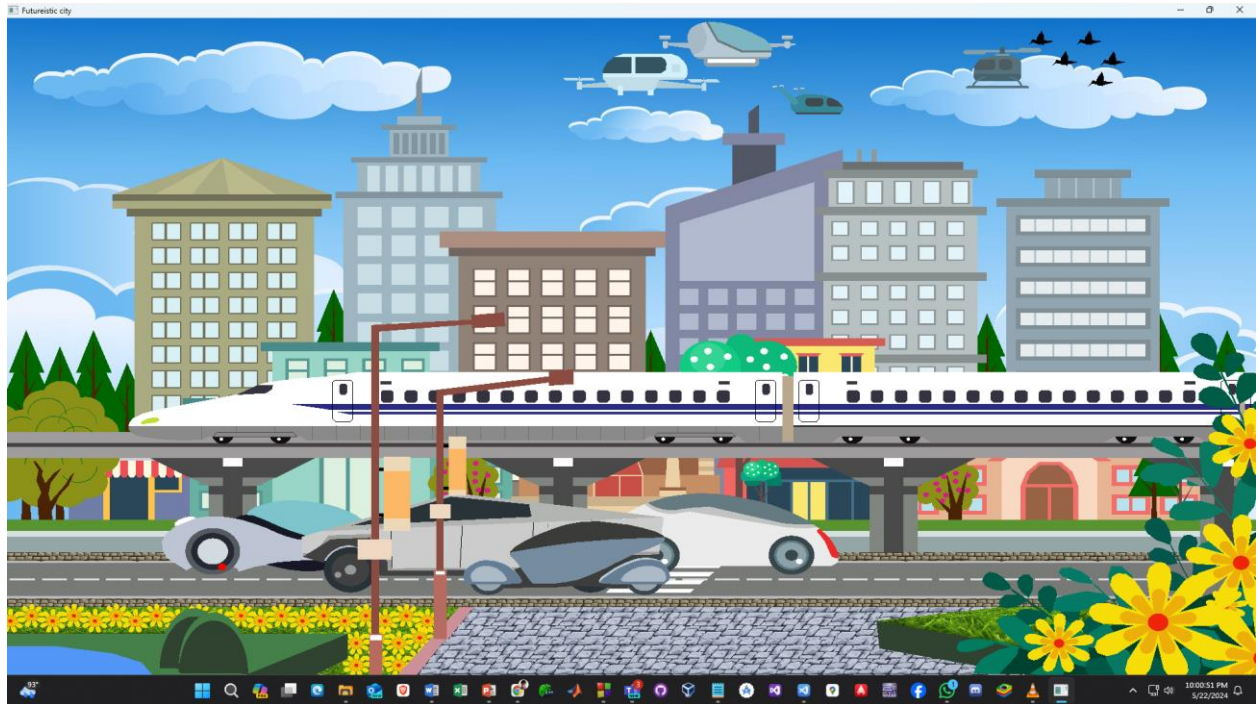
Picture – 01 : Initial view of third scenario
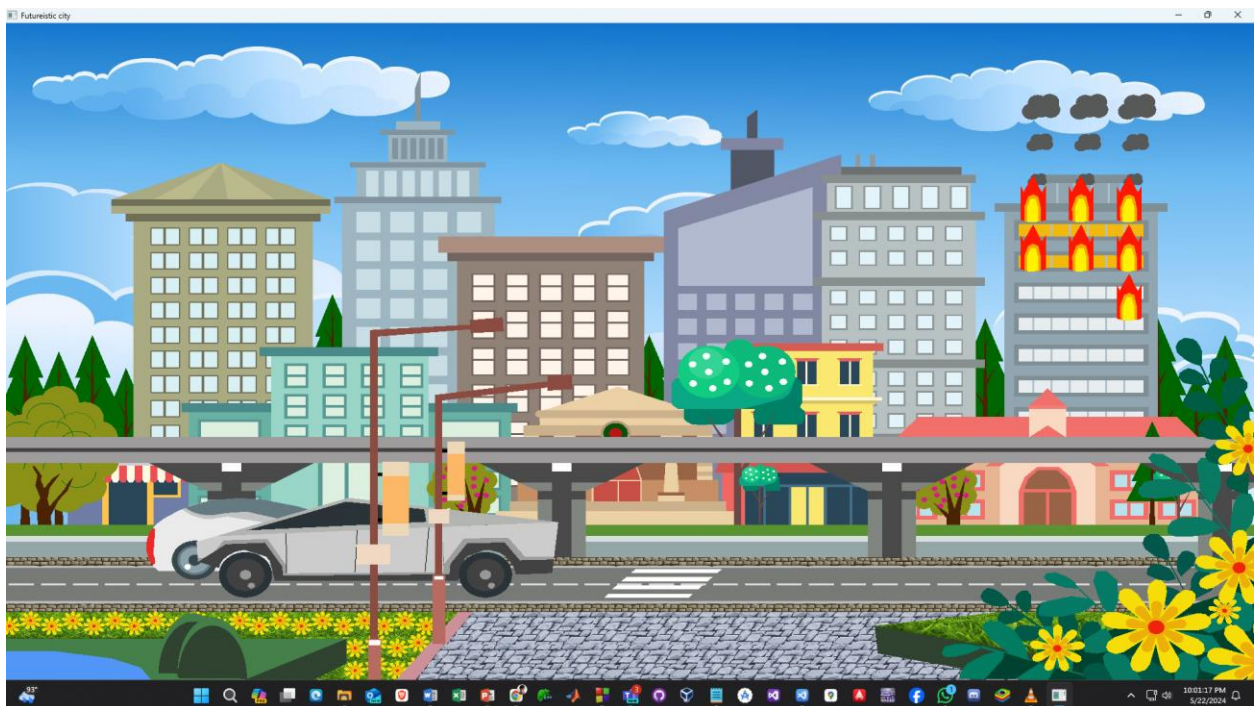
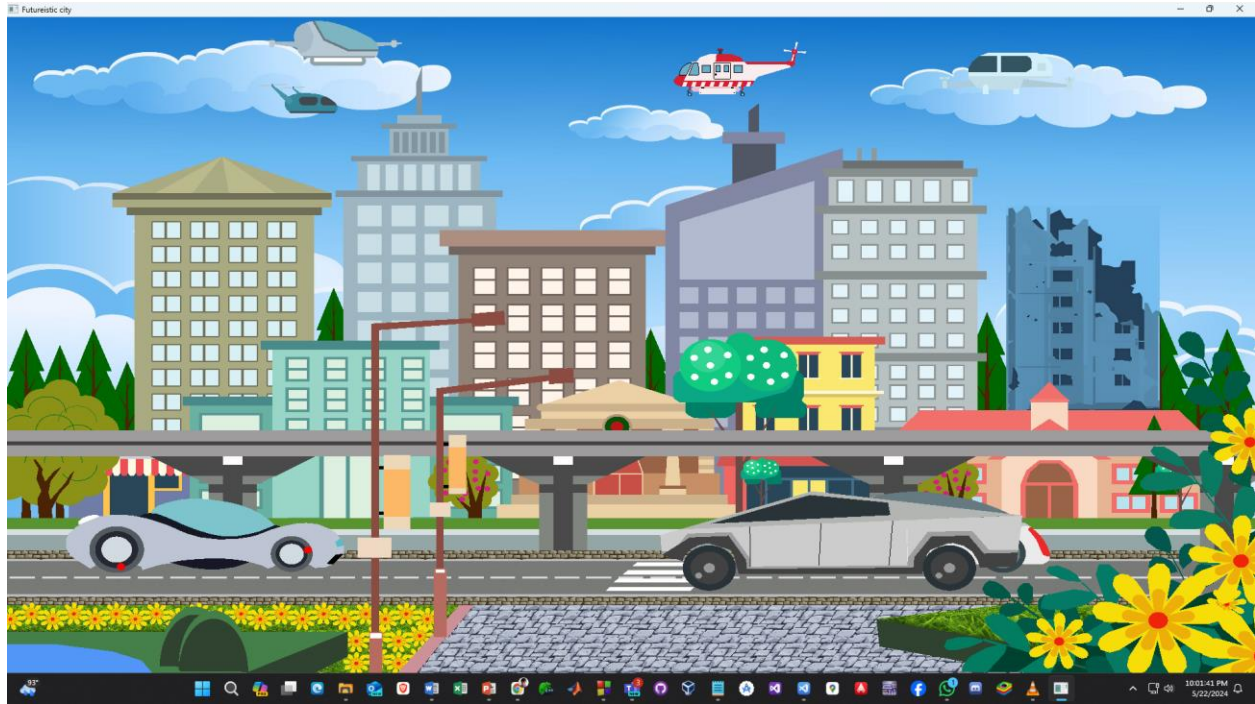Picture – 02 : Fire and fire smoke effect of third scenario

Picture – 03 : Helicopter and water effect to distinguish the fire

Picture – 04 : Zoom effect on helicopter and fire

Picture – 05 :Last view of third scenario of destroyed texture applied on building after fire