

COMPUTER GRAPHICS – PROJECT DOCUMENTATION

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| --- | --- |
| **Course Name** | **Computer Graphics** |
| **Section** | **F** |
| **Course Tutor** | **ANEEM AL AHSAN RUPAI** |

**Group Members Information:**

|  |  |
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**Introduction**

The project will demonstrate scenario of a “Sea-Mountain View of Winter” and “City View” scene. We implemented a scenario of mountain and sea in winter view when snowfall will happen. In the next scenario, we implemented a city life where day and night view will be shown. There will be rain feature in day and night view by pressing a keyboard button in the city view. There will be also snow feature in sea mountain scene. All together it would render an eye pleasing sea-mountain sights and city view scenario. Our program provides fast and accurate rendering of the objects as well as a landscape to simulate a sea mountain and city view.

**Proposal**

The project is about scenario type. There will be two scenes in our project, first will be a “Sea-Mountain view of Winter”. There will be mountains, cargo ships, boats, bridges, lampposts, train, car, sun, plane, clouds, trees and many more. In this view, snowfall will be started after pressing a button and some components will be covered by snow.

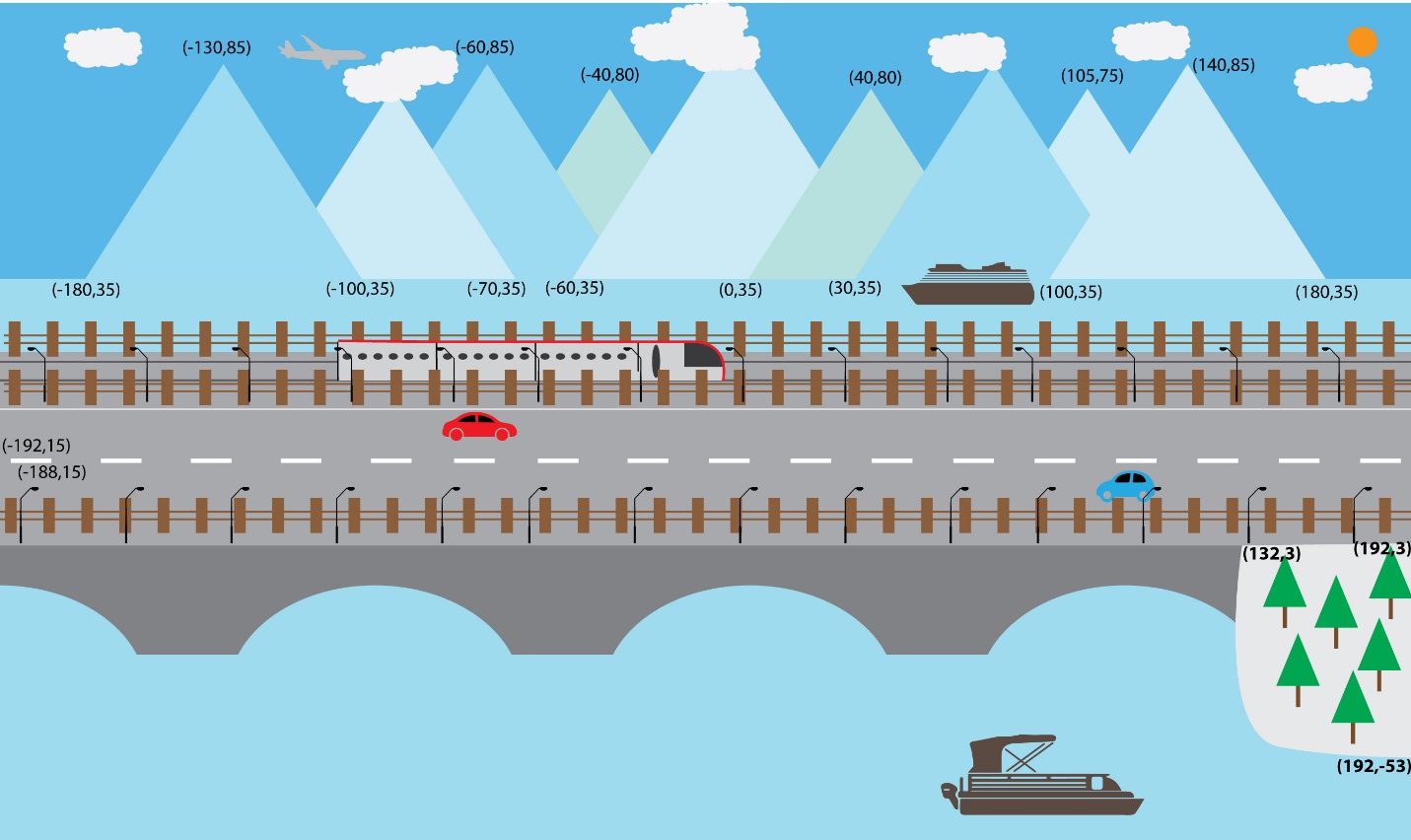
The second scene will be a “City View” scene. In city view, there will be a three-way road in a city area beside lakeside with multiple buildings, trees, cars, lake, boats, plane, trump, cloud, helicopter, lamppost, traffic light, post box, bench, park and other small components. It will have summer and rainy seasons with day, night and rainy view. There will have multiple animation in this project.

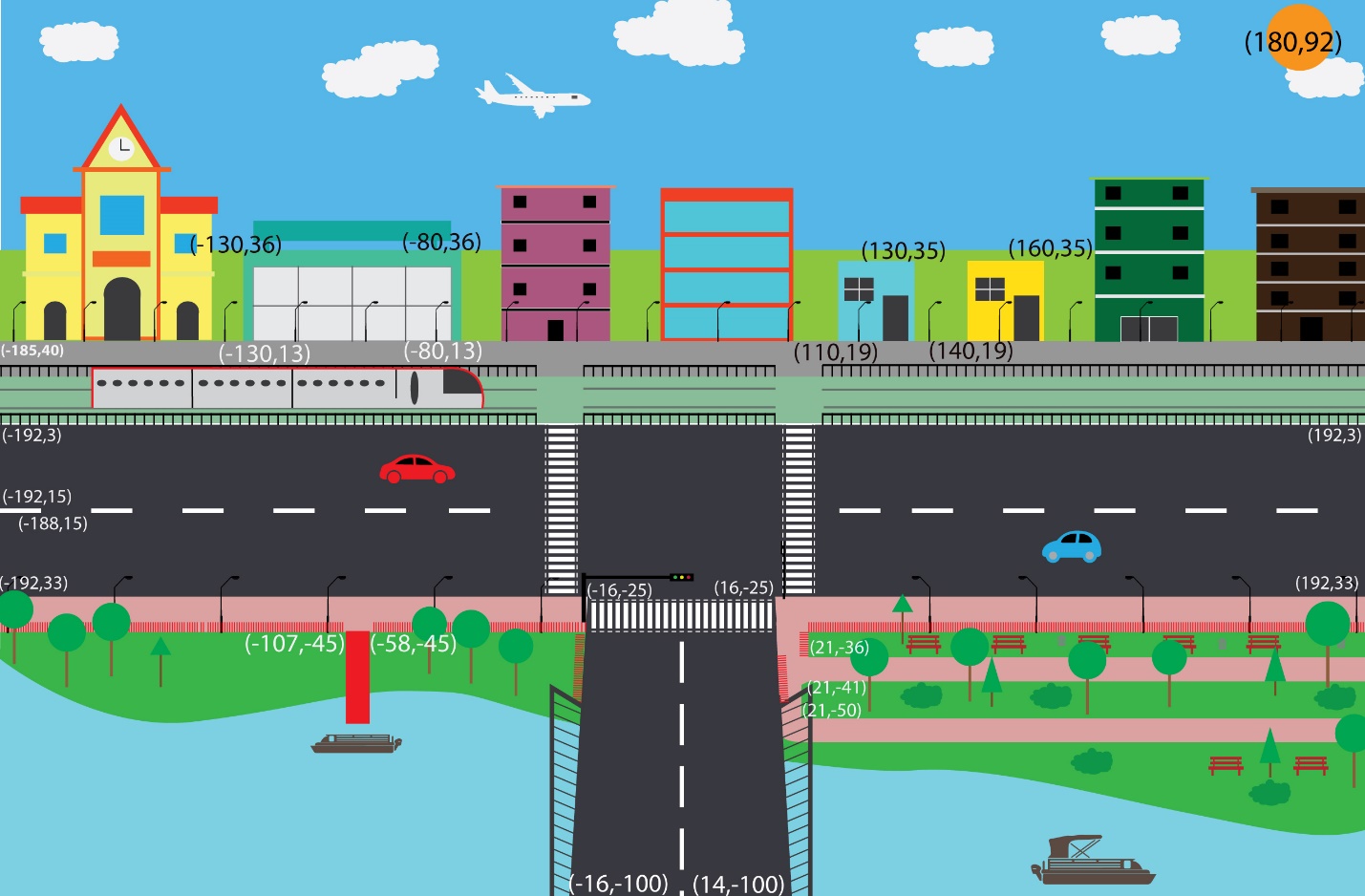
**Component**

* Sky
* Sun
* Moon
* Star
* Cloud
* Mountain
* Glacier
* Field
* Road
* Footpath
* Sea
* Lake
* Bridge
* Plane
* Helicopter
* Trump
* Car
* RV
* Truck
* Dock
* Boat
* Ship
* Tree
* Bush
* Park
* Post box
* Lamppost
* Bench
* Traffic lights
* Dustbin
* Building
* Mall
* Shop
* Station
* Car shop

**Animation**

* Cloud
* Sun
* Moon
* Wave
* Plane
* Helicopter
* Clock
* Trump
* Car
* Truck
* RV
* Boat
* Ship
* Day-night
* Rain
* Snow
* Snow effect

**Schematic Diagram** 



**List of Objects**

1. Sky
2. Star
3. Sun
4. Moon
5. Cloud
6. Snow
7. Rain
8. Plane
9. Helicopter
10. Mountain
11. Glacier
12. Lake
13. Ship1
14. Ship2
15. Boat1
16. Boat2
17. Grass
18. Bridge1
19. Bridge2
20. Road
21. Trainline
22. Trump
23. Road Sign
24. Traffic Signal
25. Truck
26. RV
27. Car1
28. Car2
29. Railing
30. Fence
31. Lamp-post
32. Tree
33. Bush
34. Dustbin
35. Postbox
36. Footpath
37. Park road
38. Bench
39. Dock
40. Building1
41. Building2
42. Building3
43. Building4
44. Mall
45. Shop
46. Car Shop
47. Mini Shop
48. Station
49. Clock
50. Rain\_cloud
51. Snow\_cloud

**Functions to Represent the Objects**

**\*ID: 2-Components, 2-Serial, 2-Extra Part, 1-Update**

|  |  |  |
| --- | --- | --- |
| **Object**  **List of Objects** | **Function** | **ID** |
|  | void star() | 0101 |
| **Star** | void star1() | 010101 |
|  | void star3() | 010102 |
|  | void star2() | 010103 |
| **Sky** | void sky() | 0201 |
| **Mountain** | void mountain() | 0301 |
| **Glacier** | void glacier() | 0401 |
| **Grass** | void grass() | 0501 |
|  | void bridge() | 0601 |
| **Bridge** | void bridge\_1() | 0602 |
| **Road** | void road() | 0701 |
| **Road-sign** | void roadsign() | 0801 |
| **Traffic** | void traffic() | 0901 |
|  | void traffic1() | 0902 |
| **Railing** | void ralling1() | 1001 |
|  | void ralling2() | 1002 |
|  | void ralling3() | 1003 |
|  | void fence() | 1101 |
| **Fence** | void fence\_train\_top() | 1102 |
|  | void fence\_train\_buttom() | 1103 |
|  | void lampost\_top\_1() | 1201 |
| **Lamppost** | void lampost\_buttom\_1() | 1202 |
|  | void lampost() | 1203 |
|  | void tree\_1() | 1301 |
|  | void tree\_2() | 1302 |
|  | void tree\_3() | 1303 |
|  | void tree\_4() | 1304 |
|  | void tree\_5() | 1305 |
| **Tree** | void tree\_6() | 1306 |
|  | void tree\_7() | 1307 |
|  | void tree\_8() | 1308 |
|  | void tree\_9() | 1309 |
|  | void field\_tree() | 1310 |
|  | void field\_tree1() | 1311 |
|  | void field\_tree2() | 1312 |
|  | void field\_tree3() | 1313 |
|  | void field\_tree4() | 1314 |
|  | void park\_tree() | 1315 |
| **Mini Shop Side** | void mini\_shop\_side() | 1401 |
|  | void bush() | 1501 |
|  | void bush\_1() | 1502 |
| **Bush** | void bush\_2() | 1503 |
|  | void bush\_3() | 1504 |
|  | void bush\_4() | 1505 |
|  | void bush\_5() | 1506 |
|  | void bush\_6() | 1507 |
| **Dustbin** | void dustbin() | 1601 |
| **Post Box** | void post\_box\_park() | 1701 |
|  | void post\_box\_trump() | 1702 |
| **Footpath** | void footpath() | 1801 |
| **Park road** | void park\_road() | 1901 |
| **Park Bench** | void park\_bench() | 2001 |
| **Dock** | void dock() | 2101 |
| **Building** | void building1() | 2201 |
|  | void building2() | 2202 |
|  | void building3() | 2203 |
|  | void building4() | 2204 |
| **Mall** | void mall() | 2205 |
| **Shop** | void shop() | 2206 |
| **Car Shop** | void car\_shop() | 2207 |
| **Mini Shop** | void mini\_shop\_1() | 2208 |
|  | void mini\_shop\_2() | 2209 |
| **Station** | void station() | 2210 |
| **Sun** | void sun() | 2301 |
| **Moon** | void moon() | 2401 |
| **Lake** | void lake() | 2501 |
|  | void cloud() | 2601 |
|  | void cloud\_1() | 2602 |
|  | void cloud\_2() | 2603 |
| **Cloud** | void cloud\_3() | 2604 |
|  | void cloud\_4() | 2605 |
|  | void cloud\_5() | 2606 |
|  | void cloud\_6() | 2607 |
|  | void cloud\_7() | 2608 |
|  | void cloud\_8() | 2609 |
|  | void cloud\_9() | 2610 |
|  | void cloud\_10() | 2611 |
|  | void cloud\_11() | 2612 |
|  | void cloud\_12() | 2613 |
|  | void cloud\_13() | 2614 |
|  | void cloud\_14() | 2615 |
|  | void cloud\_15() | 2616 |
|  | void cloud\_16() | 2617 |
| **Snow** | void snow1() | 2701 |
|  | void snow2() | 2702 |
|  | void snow3() | 2703 |
|  | void snow4() | 2704 |
|  | void snow5() | 2705 |
|  | void snow() | 2706 |
|  | void snowfall\_1() | 2707 |
|  | void snowfall\_2() | 2708 |
|  | void snow\_shade\_tree\_0() | 2709 |
|  | void snow\_shade\_tree() | 2710 |
| **Snow Cloud** | void snow\_cloud() | 2801 |
|  | void snow\_cloud1() | 2802 |
| **Rain Cloud** | void rain\_cloud() | 2901 |
|  | void rain\_cloud1() | 2902 |
| **Rain** | void rain() | 3001 |
| **Plane** | void plane() | 3201 |
| **Plane-2** | void plane\_1() | 3202 |
| **Helicopter** | void heli\_blade1() | 330101 |
|  | void heli\_blade2() | 330102 |
|  | void heli\_body() | 330103 |
|  | void helicopter() | 3301 |
| **Ship** | void ship\_body() | 340101 |
|  | void ship\_pillar() | 340102 |
|  | void ship\_container() | 340103 |
|  | void ship\_container\_1() | 340104 |
|  | void ship\_container\_2() | 340105 |
|  | void ship\_container\_3() | 340106 |
|  | void ship\_container\_4() | 340107 |
|  | void ship\_container\_5() | 340108 |
|  | void ship\_container\_6() | 340109 |
|  | void ship\_container\_7() | 340110 |
|  | void ship\_container\_8() | 340111 |
|  | void ship\_container\_9() | 340112 |
|  | void ship\_container\_10() | 340113 |
|  | void ship\_container\_11() | 340114 |
|  | void ship\_container\_12() | 340115 |
|  | void ship() | 3401 |
| **Ship-2** | void ship\_2() | 3402 |
| **Boat** | void boat\_1() | 3403 |
| **Boat-2** | void boat\_11() | 3405 |
| **Boat-3** | void boat\_2() | 3404 |
| **Boat-4** | void boat\_21() | 3406 |
| **Trump** | void t\_body() | 350101 |
|  | void t\_body2() | 350102 |
|  | void t\_body3() | 350103 |
|  | void t\_body4() | 350104 |
|  | void trump() | 3501 |
| **Trump-2** | void trump\_1() | 3502 |
| **Truck** | void truck\_tire1() | 360101 |
|  | void truck\_tire2() | 360102 |
|  | void truck\_tire3() | 360102 |
|  | void truck () | 3601 |
| **Truck-2** | void truck \_1() | 3602 |
| **RV** | void rv\_tire1() | 370101 |
|  | void rv\_tire2() | 370102 |
|  | void rv\_tire3() | 370103 |
|  | void rv() | 3701 |
| **RV-2** | void rv\_1() | 3702 |
| **Car-1** | void c1\_body() | 380101 |
|  | void c1\_tire1() | 380102 |
|  | void c1\_tire2() | 380103 |
|  | void car1() | 3801 |
| **Car-2** | void car1\_1() | 3802 |
| **Car-3** | void c2\_body() | 380301 |
|  | void c2\_tire1() | 380302 |
|  | void c2\_tire2() | 380303 |
|  | void car2() | 3803 |
| **Car-4** | void car2\_1() | 3804 |

**Interactive Functions**

|  |  |  |
| --- | --- | --- |
| **Interactive Functions** | **Interaction** | **ID** |
| void update\_station\_clock(int value) | station\_clock\_minute\_move, station\_clock\_hour\_move | 2210001 |
| void update\_sun(int value) | sun\_move | 2301001 |
| void update\_moon(int value) | moon\_move | 2401001 |
| void update\_wave(int value) | lake\_move | 2501001 |
| void update\_cloud(int value) | cloud\_1\_move\_right - cloud\_8\_move\_right | 2601001 |
| void snow\_update(int value) | snow\_move\_x, snow\_move\_y,snow\_speed | 2701001 |
| void snow\_update1(int value) | snow\_move\_x1, snow\_move\_y1 | 2701002 |
| void snow\_cloud\_update(int value) | snow\_move\_cloud, snow\_move\_cloud2 | 2801001 |
| void snow\_cloud\_stop(int value) | snow\_move\_cloud, snow\_move\_cloud2 | 2801002 |
| void rain\_cloud\_update(int value) | rain\_move\_cloud, rain\_move\_cloud2 | 2901001 |
| void rain\_cloud\_stop(int value) | rain\_move\_cloud, rain\_move\_cloud2 | 2901002 |
| void rain\_update(int value) | rain\_move\_x, rain\_move\_y | 3001001 |
| void update\_plane(int value) | plane\_move | 3201001 |
| void helicopter\_angle(int value) | heli\_angle | 3301001 |
| void helicopter\_movex(int value) | heli\_movex, heli\_movey | 3301002 |
| void helicopter\_movey(int value) | heli\_movey | 3301003 |
| void update\_ship\_1(int value) | ship\_1\_move\_right | 3401001 |
| void update\_ship\_2(int value) | ship\_2\_move\_left | 3402001 |
| void update\_boat\_1(int value) | boat\_1\_move\_right | 3403001 |
| void update\_boat\_2(int value) | boat\_2\_move\_left | 3404001 |
| void update\_boat\_21(int value) | boat\_21\_move\_right | 3406001 |
| void trump\_update(int value) | trump\_move,trump\_speed | 3501001 |
| void trump\_1\_update(int value) | trump\_1\_move | 3502001 |
| void update\_tuck\_tire(int value) | truck\_tire\_rotate\_left | 3601001 |
| void update\_tuck(int value) | truck\_move | 3601002 |
| void update\_tuck\_1(int value) | truck\_move\_1 | 3602001 |
| void update\_rv\_tire(int value) | van1\_tire\_rotate\_right | 3701001 |
| void update\_rv(int value) | Van1\_move | 3701002 |
| void car2\_angle(int value) | \_angle1 | 3801001 |
| void car2move(int value) | \_move1 | 3801002 |
| void car1move(int value) | car1\_move | 3801003 |
| void car1angle(int value) | car1\_angle | 3801004 |

**Task Assignment and Codes of Functions**

**Contribution Table:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Member-1** | **Member-2** | **Member-3** | **TOTAL** |
| 33.33% | 33.33% | 33.33% | 100% |

|  |  |
| --- | --- |
| **Name**  **ID** | **Contribution in Project** |
| **Abdullah Al Amin**  **19-39502-1** | **Object**   1. sky 2. Sun 3. Moon 4. Grass 5. Plane 6. Truck 7. RV 8. Building1 9. Building2 10. Mall 11. Shop 12. Car Shop 13. Mini Shop-1 14. Mini Shop-2 15. Railing 16. lamppost 17. Fence 18. Postbox   **Animation**   1. Sun 2. Moon 3. Plane 4. Truck 5. RV 6. Clock 7. Night 8. Snow Effect |
| **Karim, Rezaul**  **19-39521-1** | 1. Star 2. Snow 3. Helicopter 4. Glacier 5. Lake 6. Grass 7. Bridge-1 8. Bridge-2 9. Road 10. Train-line 11. Trump 12. Road-sign 13. Traffic-signal 14. Car-1 15. Car-2 16. Tree 17. Dock 18. Building3 19. Building4   **Animation**   1. Car-1 2. Car-2 3. Trump 4. Helicopter 5. Snow 6. Snow Cloud 7. Wave |
| **Dip Roy**  **19-394544-1** | 1. Bench 2. Park road 3. Dustbin 4. Tree 5. Bush 6. Cloud 7. Station 8. Clock 9. Rain 10. Boat-1 11. Boat-2 12. Ship-1 13. Ship-2 14. Mountain 15. Lamppost 16. Rain-cloud 17. Footpath   **Animation**   1. Boat-1 2. Boat-2 3. Ship-1 4. Ship-2 5. Cloud 6. Rain 7. Rain Cloud |

**OUTPUT**

|  |  |
| --- | --- |
| **Day View1** |  |
| **Snow**  **View** |  |
| **Day View2** |  |
| **Night**  **view** |  |
| **Rain**  **view** |  |

**Conclusion**

Our program starts with a sea-mountain view in winter. In this scene, we implemented snow mode. By pressing ‘r’ key, Snow cloud covers the full sky. After a moment, full sky covers with snow cloud and snowfall starts. During the snowfall, snow effects on road, bridge, tree & sea starts continuously. A train passes in the scenario. When the train passes left to right fully from there city scene starts. We have implemented an automatic view of city scenario where day and night are automatically time lapsing of the clock. Sun and moon automatically rise in the sky with the time of day and night. There is also a manual keyboard interaction of day and night feature. In the city scenario, we also implemented rain feature. Using ‘r’ keyboard button rain can be called. Before starting rain fall all the sky will be cover with rain cloud. Then the rainfall starts and creates a water overflow in the lake. The rainfall can stop any time by using keyboard button ‘s’. The program runs everything with some automated feature. Even those features can be control manually. The program runs much smoothy that one scene to another scene can be called anytime and both scene runs in real time. So, switching one display to another, both displays feature will run smoothly.