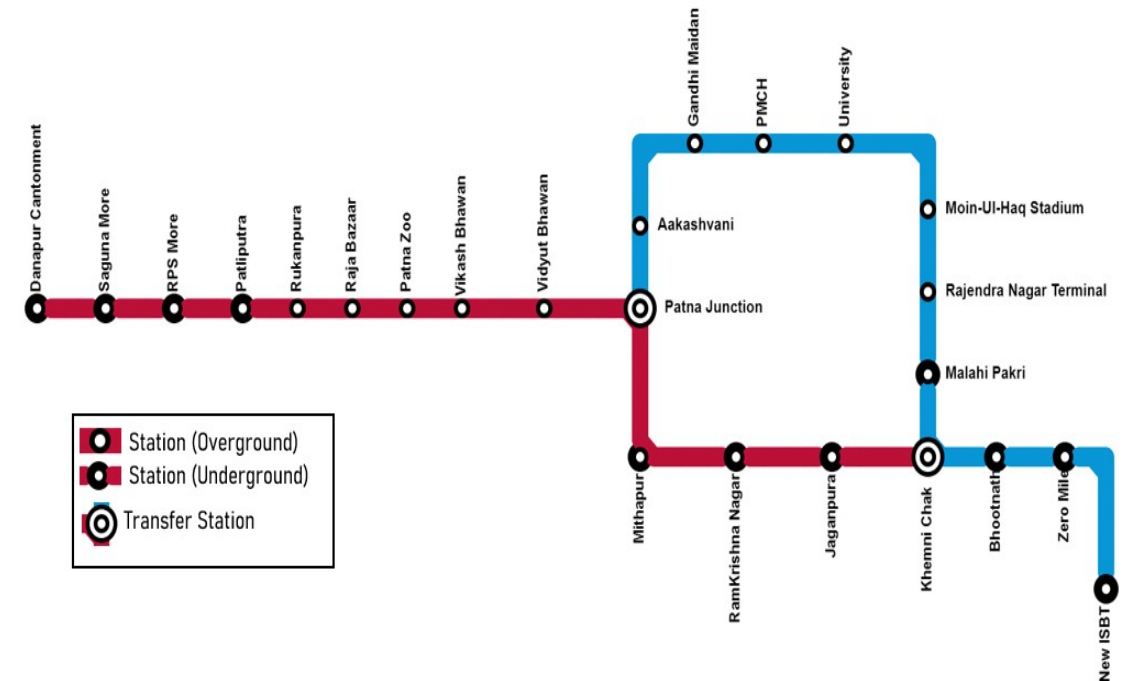
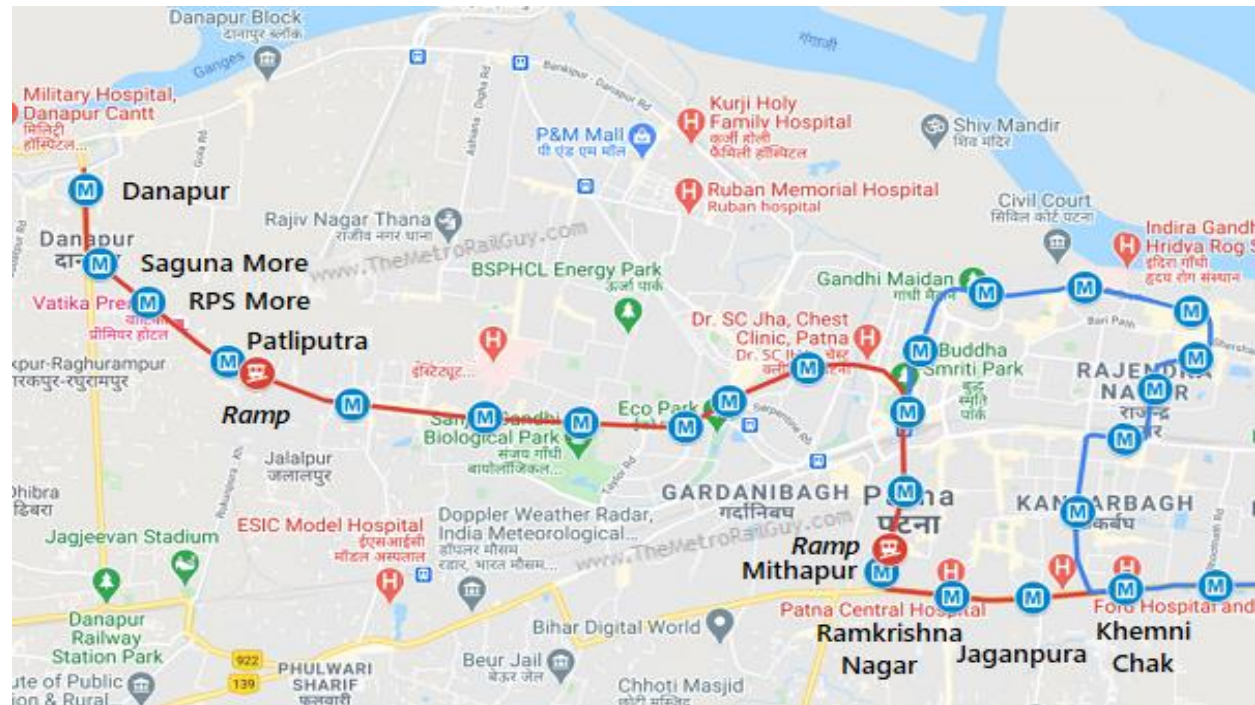




PATNA METRO RAIL APP



- Intro of Patna Metro Rail App:-
- Patna Metro is rapid transit system currently under construction in the city of Patna in Bihar (India).





Requirements

The Collection in Java is a framework that provides an architecture to store and manipulate the group of objects.

- **In Graph_M.java**

- . Array List
- . Linked List
- . Stack
- . HashMap

- **In Heap.java**

- . HashMap
- . Array List



Data Structures

- Data structure is a way of organizing data in the computer so that it can be used effectively. The data structures used in this project are:
- Array
- HashMap
- Linked List
- Heap
- Stack
- Graph



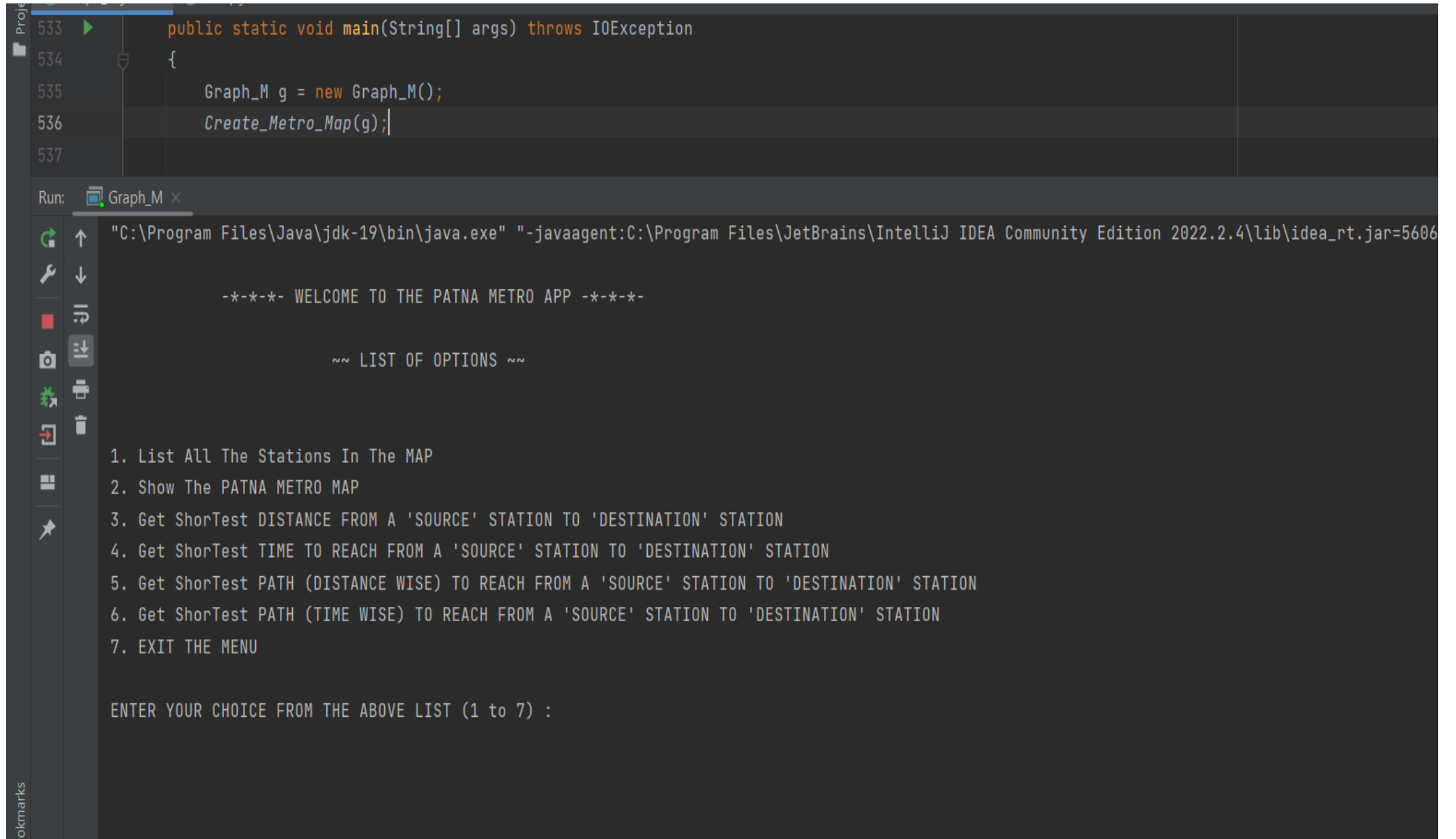
- The array data structure is implemented using Array List class which is a resizable array. It stores data in contiguous memory locations.
- HashMap data structure is used to store key-value pairs.
- The stack data structure required by the algorithm is implemented using linked list. It follows the principle Last In First Out(LIFO)
- Heap is implemented with the help of Array List and HashMap. It is a tree based data structure where all elements of the tree are in a particular order.
- Graph is a complex data structure containing vertices and edges connecting these vertices. This is implemented in the project with the help of Array List and HashMap.

GitHub :-

<https://github.com/ranjansingh9900/Patna-matro-map-app>

*Thank
You*

Output we have 7 options.



The screenshot displays the IntelliJ IDEA interface. The top pane shows a Java file with the following code:

```
533 public static void main(String[] args) throws IOException
534 {
535     Graph_M g = new Graph_M();
536     Create_Metro_Map(g);
537 }
```

The bottom pane shows the output of the program, titled "Run: Graph_M x". The output text is as follows:

```
"C:\Program Files\Java\jdk-19\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2022.2.4\lib\idea_rt.jar=5606"
    -*-*- WELCOME TO THE PATNA METRO APP -*-*-

    ~~ LIST OF OPTIONS ~~

1. List All The Stations In The MAP
2. Show The PATNA METRO MAP
3. Get Shortest DISTANCE FROM A 'SOURCE' STATION TO 'DESTINATION' STATION
4. Get Shortest TIME TO REACH FROM A 'SOURCE' STATION TO 'DESTINATION' STATION
5. Get Shortest PATH (DISTANCE WISE) TO REACH FROM A 'SOURCE' STATION TO 'DESTINATION' STATION
6. Get Shortest PATH (TIME WISE) TO REACH FROM A 'SOURCE' STATION TO 'DESTINATION' STATION
7. EXIT THE MENU

ENTER YOUR CHOICE FROM THE ABOVE LIST (1 to 7) :
```

Output chose 1

```
535      Graph_M g = new Graph_M();
536      Create_Metro_Map(g);
537
```

Run: Graph_M x

ENTER YOUR CHOICE FROM THE ABOVE LIST (1 to 7) : 1

1. Mithapur ~MM
2. Rukanpura ~RR
3. Raja Bazaar ~RB
4. New ISBT ~NI
5. Patna University ~PU
6. Zero Mile ~ZM
7. Patli Putra ~PP
8. Malahi Pakri ~MP
9. Vikash i Bhawan ~ViB
10. Danapur Cantonment ~DC
11. Saguna More ~SM
12. Vidyut Bhawan ~VB
13. Aakashvani ~AA
14. Patna Junction ~PJ
15. Patna Zoo ~PZ
16. Rajendra nager Terminal ~RnT
17. RamKrishna Nager ~RN
18. PM CH ~PC
19. Khemni Chak ~KC
20. Grandhi Maidan ~GM

Version Control Run TODO Problems Terminal Services Build

All files are up-to-date (a minute ago)

14°C

Output chose 2

```
535 Graph_M g = new Graph_M();
536 Create_Metro_Map(g);
537
```

Run: Graph_M x

ENTER YOUR CHOICE FROM THE ABOVE LIST (1 to 7) : 2

Patna Metro Map

Mithapur ~MM =>
Patna Junction ~PJ 2
RamKrishna Nager ~RN 5

Rukanpura ~RR =>
Raja Bazaar ~RB 2
Patli Putra ~PP 6

Raja Bazaar ~RB =>
Rukanpura ~RR 2
Patna Zoo ~PZ 2

New ISBT ~NI =>
Zero Mile ~ZM 2

Patna University ~PU =>
PM CH ~PC 1

Zero Mile ~ZM =>

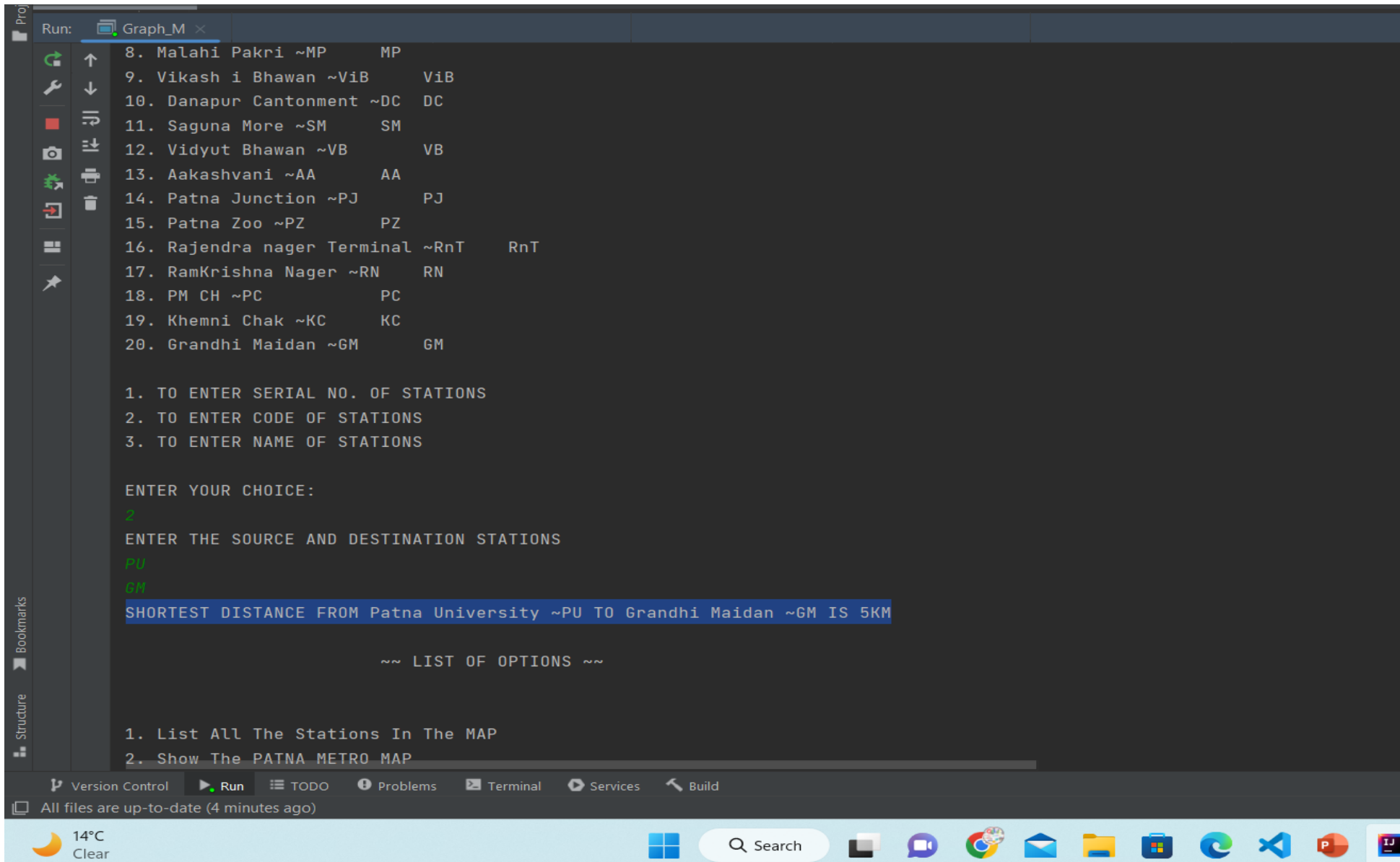
Version Control Run TODO Problems Terminal Services Build

All files are up-to-date (2 minutes ago)

14°C Clear

Search

Output chose 2



```
Run: Graph_M x
8. Malahi Pakri ~MP      MP
9. Vikash i Bhawan ~ViB  ViB
10. Danapur Cantonment ~DC DC
11. Saguna More ~SM      SM
12. Vidyut Bhawan ~VB    VB
13. Aakashvani ~AA       AA
14. Patna Junction ~PJ    PJ
15. Patna Zoo ~PZ        PZ
16. Rajendra nager Terminal ~RnT  RnT
17. RamKrishna Nager ~RN      RN
18. PM CH ~PC            PC
19. Khemni Chak ~KC       KC
20. Grandhi Maidan ~GM     GM

1. TO ENTER SERIAL NO. OF STATIONS
2. TO ENTER CODE OF STATIONS
3. TO ENTER NAME OF STATIONS

ENTER YOUR CHOICE:
2
ENTER THE SOURCE AND DESTINATION STATIONS
PU
GM
SHORTEST DISTANCE FROM Patna University ~PU TO Grandhi Maidan ~GM IS 5KM

~~ LIST OF OPTIONS ~~

1. List All The Stations In The MAP
2. Show The PATNA METRO MAP
```

Version Control Run TODO Problems Terminal Services Build

All files are up-to-date (4 minutes ago)

14°C Clear

Search

Output chose 3

```
Run: Graph_M x
1. List All The Stations In The MAP
2. Show The PATNA METRO MAP
3. Get ShorTest DISTANCE FROM A 'SOURCE' STATION TO 'DESTINATION' STATION
4. Get ShorTest TIME TO REACH FROM A 'SOURCE' STATION TO 'DESTINATION' STATION
5. Get ShorTest PATH (DISTANCE WISE) TO REACH FROM A 'SOURCE' STATION TO 'DESTINATION' STATION
6. Get ShorTest PATH (TIME WISE) TO REACH FROM A 'SOURCE' STATION TO 'DESTINATION' STATION
7. EXIT THE MENU

ENTER YOUR CHOICE FROM THE ABOVE LIST (1 to 7) : 4

*****
ENTER THE SOURCE STATION: Patna University ~PU
ENTER THE DESTINATION STATION: Patna Zoo ~PZ
SHORTEST TIME FROM (Patna University ~PU) TO (Patna Zoo ~PZ) IS 28 MINUTES

~~ LIST OF OPTIONS ~~

1. List All The Stations In The MAP
2. Show The PATNA METRO MAP
3. Get ShorTest DISTANCE FROM A 'SOURCE' STATION TO 'DESTINATION' STATION
4. Get ShorTest TIME TO REACH FROM A 'SOURCE' STATION TO 'DESTINATION' STATION
5. Get ShorTest PATH (DISTANCE WISE) TO REACH FROM A 'SOURCE' STATION TO 'DESTINATION' STATION
6. Get ShorTest PATH (TIME WISE) TO REACH FROM A 'SOURCE' STATION TO 'DESTINATION' STATION
7. EXIT THE MENU

ENTER YOUR CHOICE FROM THE ABOVE LIST (1 to 7) :
```

Version Control Run TODO Problems Terminal Services Build

All files are up-to-date (5 minutes ago)

14°C Search

Output chose 4

```
Run: Graph_M

1. List All The Stations In The MAP
2. Show The PATNA METRO MAP
3. Get Shortest DISTANCE FROM A 'SOURCE' STATION TO 'DESTINATION' STATION
4. Get Shortest TIME TO REACH FROM A 'SOURCE' STATION TO 'DESTINATION' STATION
5. Get Shortest PATH (DISTANCE WISE) TO REACH FROM A 'SOURCE' STATION TO 'DESTINATION' STATION
6. Get Shortest PATH (TIME WISE) TO REACH FROM A 'SOURCE' STATION TO 'DESTINATION' STATION
7. EXIT THE MENU

ENTER YOUR CHOICE FROM THE ABOVE LIST (1 to 7) : 5

*****
ENTER THE SOURCE AND DESTINATION STATIONS
Patna University ~PU
Patna Zoo ~PZ
SOURCE STATION : Patna University ~PU
SOURCE STATION : Patna Zoo ~PZ
DISTANCE : 21
NUMBER OF INTERCHANGES : 4
~~~~~
START ==> Patna University ~PU
PM CH ~PC ==> Grandhi Maidan ~GM
Aakashvani ~AA ==> Patna Junction ~PJ
Vidyut Bhawan ~VB ==> Vikash i Bhawan ~ViB
Patna Zoo ~PZ ==> 21 ==> END
~~~~~

~~ LIST OF OPTIONS ~~

1. List All The Stations In The MAP
2. Show The PATNA METRO MAP
```

Output chose 5

```
Run: Graph_M <
1. List All The Stations In The MAP
2. Show The PATNA METRO MAP
3. Get Shortest DISTANCE FROM A 'SOURCE' STATION TO 'DESTINATION' STATION
4. Get Shortest TIME TO REACH FROM A 'SOURCE' STATION TO 'DESTINATION' STATION
5. Get Shortest PATH (DISTANCE WISE) TO REACH FROM A 'SOURCE' STATION TO 'DESTINATION' STATION
6. Get Shortest PATH (TIME WISE) TO REACH FROM A 'SOURCE' STATION TO 'DESTINATION' STATION
7. EXIT THE MENU

ENTER YOUR CHOICE FROM THE ABOVE LIST (1 to 7) : 6

*****
ENTER THE SOURCE STATION: Patna University ~PU
ENTER THE DESTINATION STATION: Patna Zoo ~PZ
SOURCE STATION : Patna University ~PU
DESTINATION STATION : Patna Zoo ~PZ
TIME : 28.0 MINUTES
NUMBER OF INTERCHANGES : 4

~~~~~
START ==> Patna University ~PU ==> PM CH ~PC ==> Grandhi Maidan ~GM
Aakashvani ~AA ==> Patna Junction ~PJ
Vidyut Bhawan ~VB ==> Vikash i Bhawan ~ViB
Patna Zoo ~PZ ==> 28.0 ==> END
~~~~~

~~ LIST OF OPTIONS ~~

1. List All The Stations In The MAP
2. Show The PATNA METRO MAP
```

Output chose 6

```
Run: Graph_M x
1. List All The Stations In The MAP
2. Show The PATNA METRO MAP
3. Get Shortest DISTANCE FROM A 'SOURCE' STATION TO 'DESTINATION' STATION
4. Get Shortest TIME TO REACH FROM A 'SOURCE' STATION TO 'DESTINATION' STATION
5. Get Shortest PATH (DISTANCE WISE) TO REACH FROM A 'SOURCE' STATION TO 'DESTINATION' STATION
6. Get Shortest PATH (TIME WISE) TO REACH FROM A 'SOURCE' STATION TO 'DESTINATION' STATION
7. EXIT THE MENU

ENTER YOUR CHOICE FROM THE ABOVE LIST (1 to 7) : 6

*****
ENTER THE SOURCE STATION: Patna University ~PU
ENTER THE DESTINATION STATION: Patna Zoo ~PZ
SOURCE STATION : Patna University ~PU
DESTINATION STATION : Patna Zoo ~PZ
TIME : 28.0 MINUTES
NUMBER OF INTERCHANGES : 4
~~~~~
START ==> Patna University ~PU ==> PM CH ~PC ==> Grandhi Maidan ~GM
Aakashvani ~AA ==> Patna Junction ~PJ
Vidyut Bhawan ~VB ==> Vikash i Bhawan ~ViB
Patna Zoo ~PZ ==> 28.0 ==> END
~~~~~

~~ LIST OF OPTIONS ~~

1. List All The Stations In The MAP
2. Show The PATNA METRO MAP
```

Version Control Run TODO Problems Terminal Services Build

All files are up-to-date (7 minutes ago)