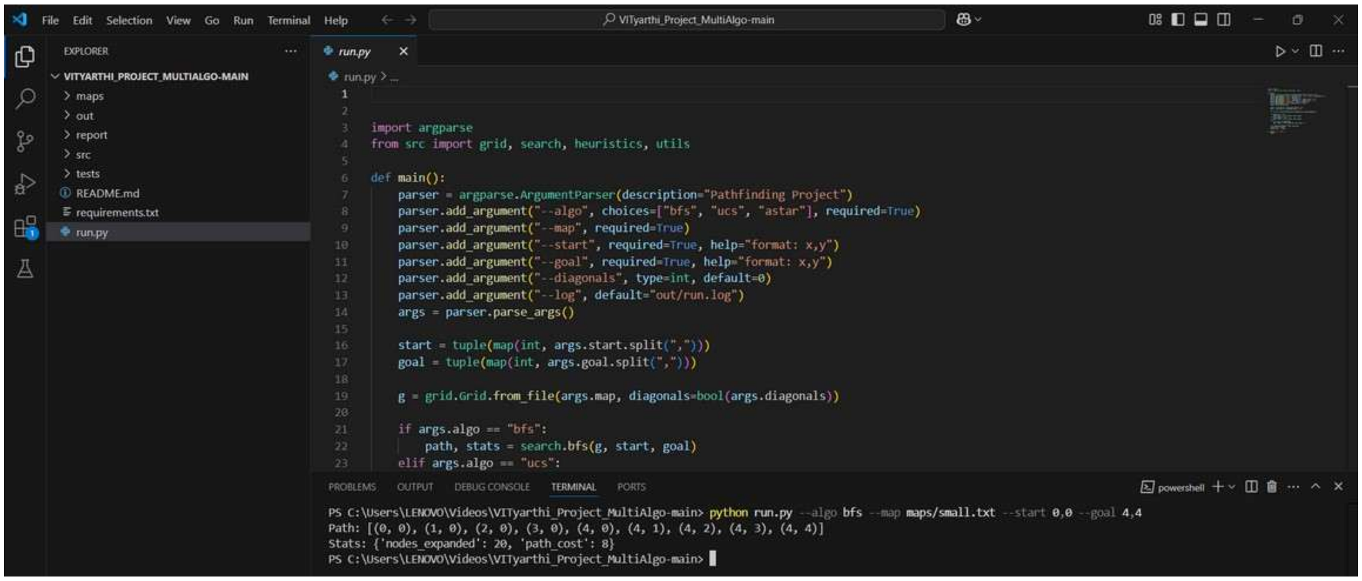
Sample Screenshots

TEST 1 : BFS

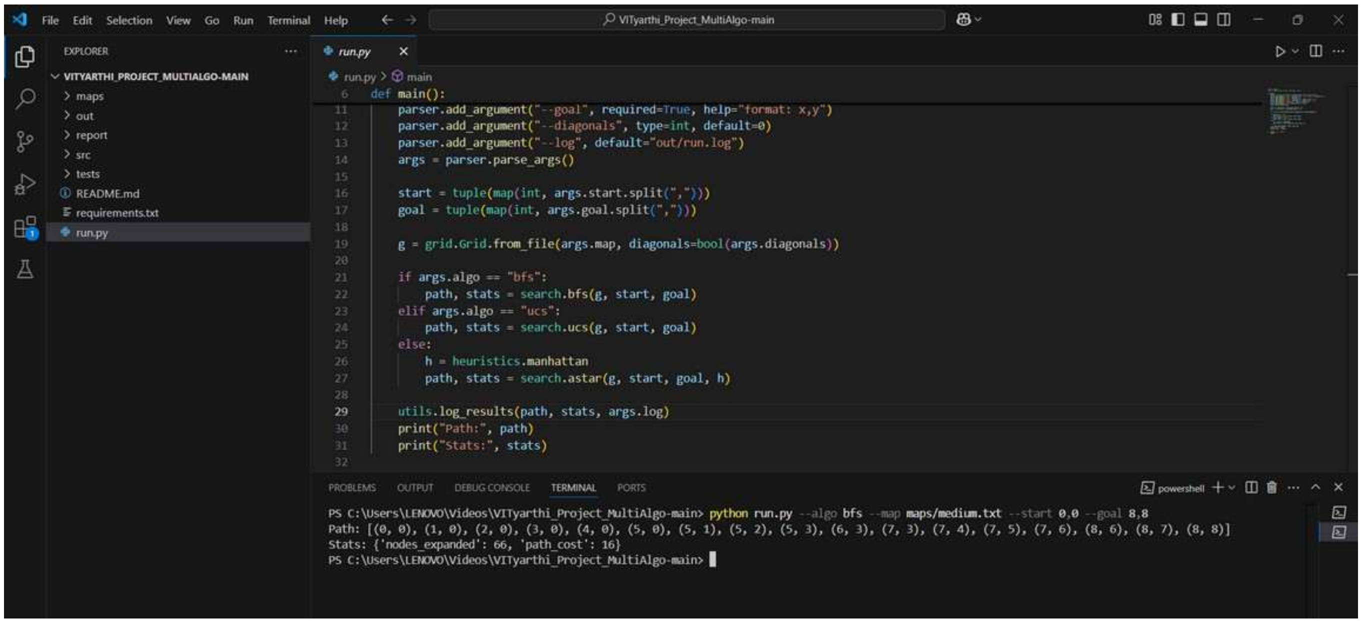
- **SMALL MAP**



```python


import argparse
from src import grid, search, heuristics, utils

def main():
    parser = argparse.ArgumentParser(description="Pathfinding Project")
    parser.add_argument("--algo", choices=["bfs", "ucs", "astar"], required=True)
    parser.add_argument("--map", required=True)
    parser.add_argument("--start", required=True, help="format: x,y")
    parser.add_argument("--goal", required=True, help="format: x,y")
    parser.add_argument("--diagonals", type=int, default=0)
    parser.add_argument("--log", default="out/run.log")
    args = parser.parse_args()

    start = tuple(map(int, args.start.split(",")))
    goal = tuple(map(int, args.goal.split(",")))

    g = grid.Grid.from_file(args.map, diagonals=bool(args.diagonals))

    if args.algo == "bfs":
        path, stats = search.bfs(g, start, goal)
    elif args.algo == "ucs":
```

```
PS C:\Users\LENOVO\Videos\VITyarthi_Project_MultiAlgo-main> python run.py --algo bfs --map maps/small.txt --start 0,0 --goal 4,4
Path: [(0, 0), (1, 0), (2, 0), (3, 0), (4, 0), (4, 1), (4, 2), (4, 3), (4, 4)]
Stats: {'nodes_expanded': 20, 'path_cost': 8}
PS C:\Users\LENOVO\Videos\VITyarthi_Project_MultiAlgo-main>
```

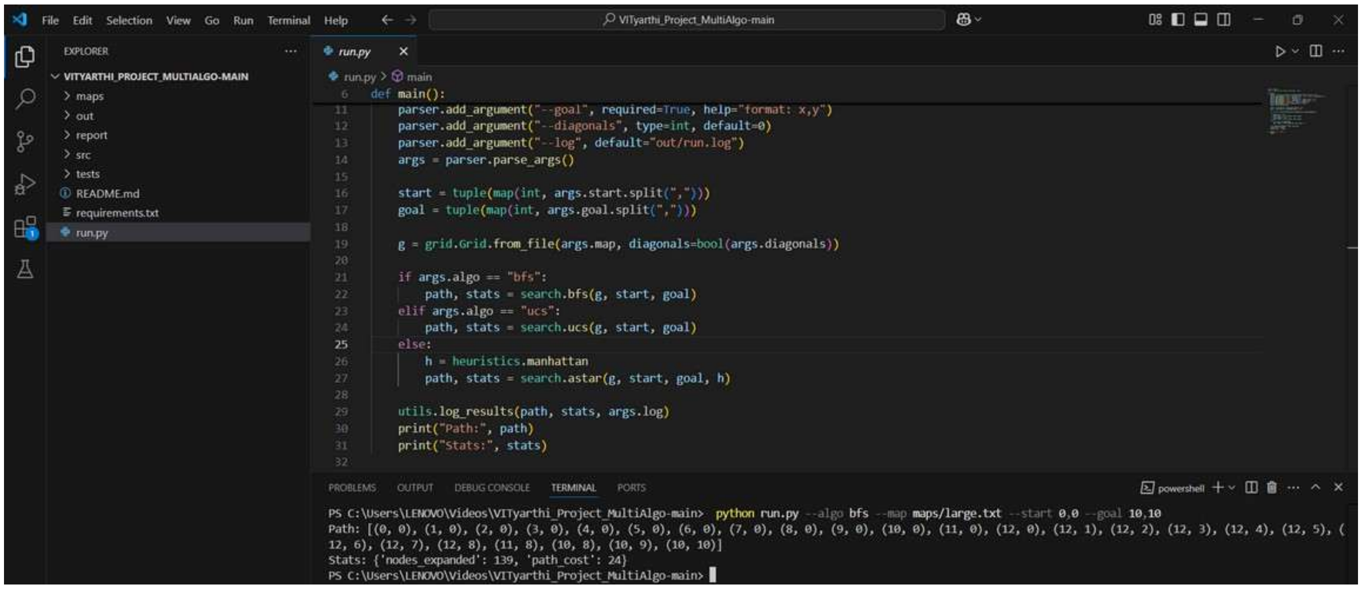
- **MEDIUM MAP**



```python
def main():
    parser.add_argument("--goal", required=True, help="format: x,y")
    parser.add_argument("--diagonals", type=int, default=0)
    parser.add_argument("--log", default="out/run.log")
    args = parser.parse_args()

    start = tuple(map(int, args.start.split(",")))
    goal = tuple(map(int, args.goal.split(",")))

    g = grid.Grid.from_file(args.map, diagonals=bool(args.diagonals))

    if args.algo == "bfs":
        path, stats = search.bfs(g, start, goal)
    elif args.algo == "ucs":
        path, stats = search.ucs(g, start, goal)
    else:
        h = heuristics.manhattan
        path, stats = search.astar(g, start, goal, h)

    utils.log_results(path, stats, args.log)
    print("Path:", path)
    print("Stats:", stats)

```

```
PS C:\Users\LENOVO\Videos\VITyarthi_Project_MultiAlgo-main> python run.py --algo bfs --map maps/medium.txt --start 0,0 --goal 8,8
Path: [(0, 0), (1, 0), (2, 0), (3, 0), (4, 0), (5, 0), (5, 1), (5, 2), (5, 3), (6, 3), (7, 3), (7, 4), (7, 5), (7, 6), (8, 6), (8, 7), (8, 8)]
Stats: {'nodes_expanded': 66, 'path_cost': 16}
PS C:\Users\LENOVO\Videos\VITyarthi_Project_MultiAlgo-main>
```

- **LARGE MAP**

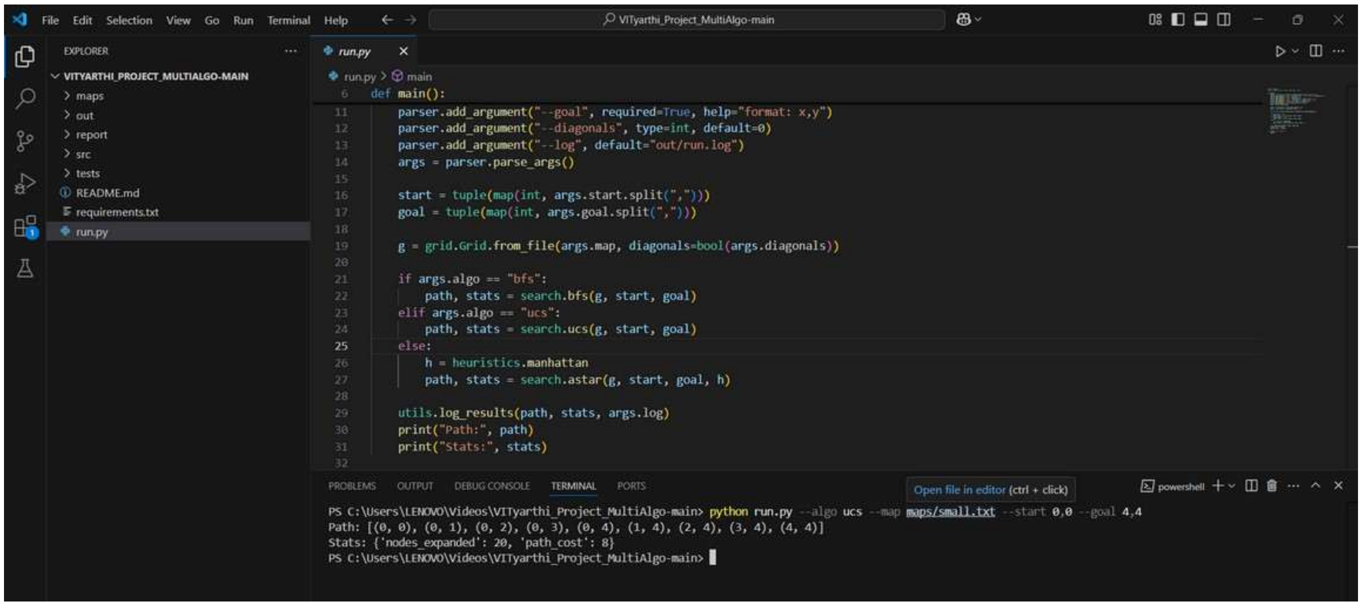


```python
def main():
    parser.add_argument("--goal", required=True, help="format: x,y")
    parser.add_argument("--diagonals", type=int, default=0)
    parser.add_argument("--log", default="out/run.log")
    args = parser.parse_args()

    start = tuple(map(int, args.start.split(",")))
    goal = tuple(map(int, args.goal.split(",")))

    g = grid.Grid.from_file(args.map, diagonals=bool(args.diagonals))

    if args.algo == "bfs":
        path, stats = search.bfs(g, start, goal)
    elif args.algo == "ucs":
        path, stats = search.ucs(g, start, goal)
    else:
        h = heuristics.manhattan
        path, stats = search.astar(g, start, goal, h)

    utils.log_results(path, stats, args.log)
    print("Path:", path)
    print("Stats:", stats)
```

```
PS C:\Users\LENOVO\Videos\VITyarthi_Project_MultiAlgo-main>  python run.py --algo bfs --map maps/large.txt --start 0,0 --goal 10,10
Path: [(0, 0), (1, 0), (2, 0), (3, 0), (4, 0), (5, 0), (6, 0), (7, 0), (8, 0), (9, 0), (10, 0), (11, 0), (12, 0), (12, 1), (12, 2), (12, 3), (12, 4), (12, 5), (
12, 6), (12, 7), (12, 8), (11, 8), (10, 8), (10, 9), (10, 10)]
Stats: {'nodes_expanded': 139, 'path_cost': 24}
PS C:\Users\LENOVO\Videos\VITyarthi_Project_MultiAlgo-main>
```

TEST 2: UCS

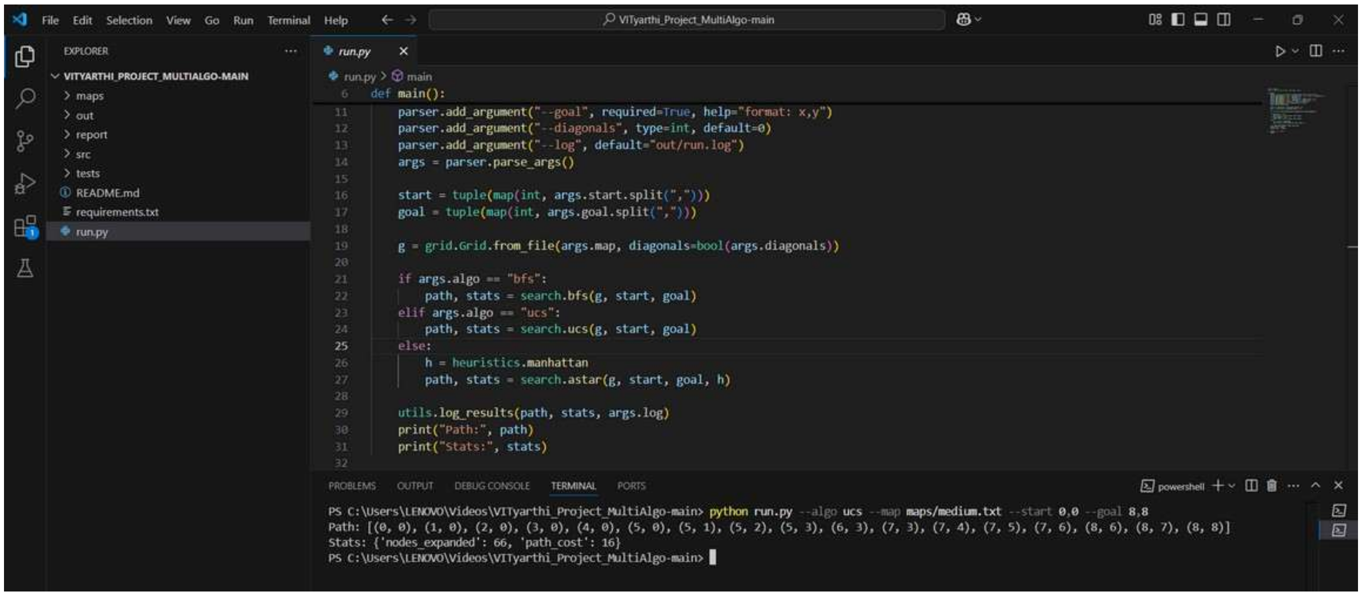
- **SMALL MAP**



```python
def main():
    parser.add_argument("--goal", required=True, help="format: x,y")
    parser.add_argument("--diagonals", type=int, default=0)
    parser.add_argument("--log", default="out/run.log")
    args = parser.parse_args()

    start = tuple(map(int, args.start.split(",")))
    goal = tuple(map(int, args.goal.split(",")))

    g = grid.Grid.from_file(args.map, diagonals=bool(args.diagonals))

    if args.algo == "bfs":
        path, stats = search.bfs(g, start, goal)
    elif args.algo == "ucs":
        path, stats = search.ucs(g, start, goal)
    else:
        h = heuristics.manhattan
        path, stats = search.astar(g, start, goal, h)

    utils.log_results(path, stats, args.log)
    print("Path:", path)
    print("Stats:", stats)
```

```
PS C:\Users\LENOVO\Videos\VITyarthi_Project_MultiAlgo-main> python run.py --algo ucs --map maps/small.txt --start 0,0 --goal 4,4
Path: [(0, 0), (0, 1), (0, 2), (0, 3), (0, 4), (1, 4), (2, 4), (3, 4), (4, 4)]
Stats: {'nodes_expanded': 20, 'path_cost': 8}
PS C:\Users\LENOVO\Videos\VITyarthi_Project_MultiAlgo-main>
```

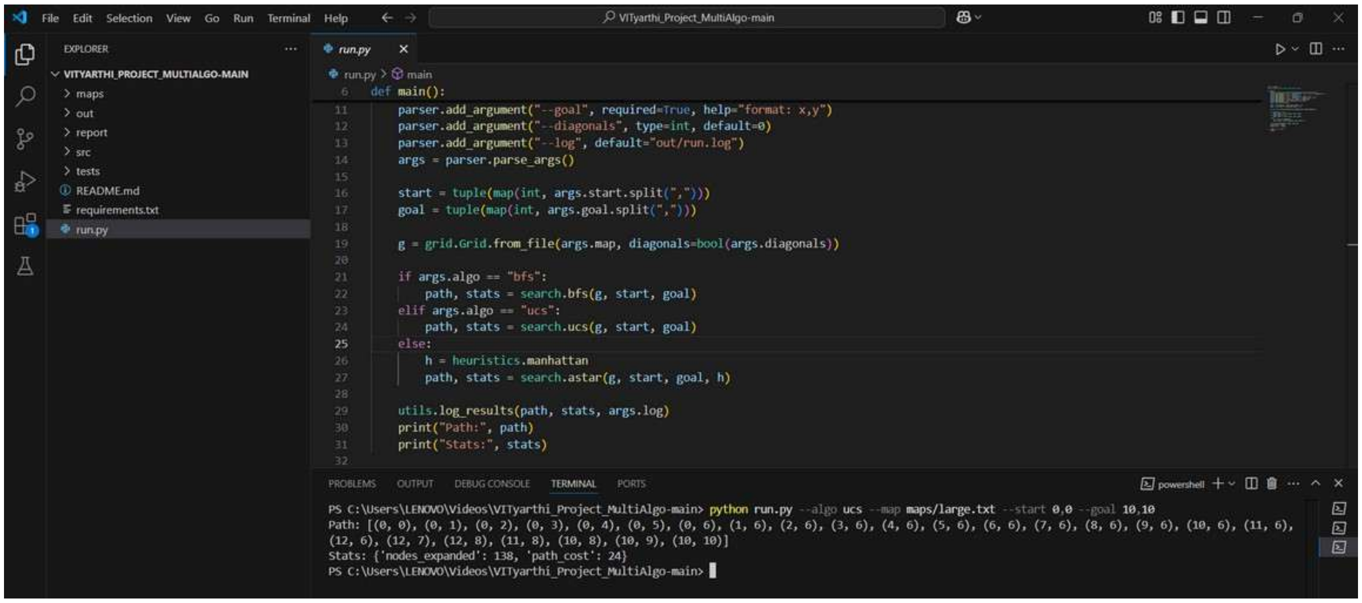
- **MEDIUM MAP**



```python
def main():
    parser.add_argument("--goal", required=True, help="format: x,y")
    parser.add_argument("--diagonals", type=int, default=0)
    parser.add_argument("--log", default="out/run.log")
    args = parser.parse_args()

    start = tuple(map(int, args.start.split(",")))
    goal = tuple(map(int, args.goal.split(",")))

    g = grid.Grid.from_file(args.map, diagonals=bool(args.diagonals))

    if args.algo == "bfs":
        path, stats = search.bfs(g, start, goal)
    elif args.algo == "ucs":
        path, stats = search.ucs(g, start, goal)
    else:
        h = heuristics.manhattan
        path, stats = search.astar(g, start, goal, h)

    utils.log_results(path, stats, args.log)
    print("Path:", path)
    print("Stats:", stats)
```

```
PS C:\Users\LENOVO\Videos\VITyarthi_Project_MultiAlgo-main> python run.py --algo ucs --map maps/medium.txt --start 0,0 --goal 8,8
Path: [(0, 0), (1, 0), (2, 0), (3, 0), (4, 0), (5, 0), (5, 1), (5, 2), (5, 3), (6, 3), (7, 3), (7, 4), (7, 5), (7, 6), (8, 6), (8, 7), (8, 8)]
Stats: {'nodes_expanded': 66, 'path_cost': 16}
PS C:\Users\LENOVO\Videos\VITyarthi_Project_MultiAlgo-main>
```

- **LARGE MAP**

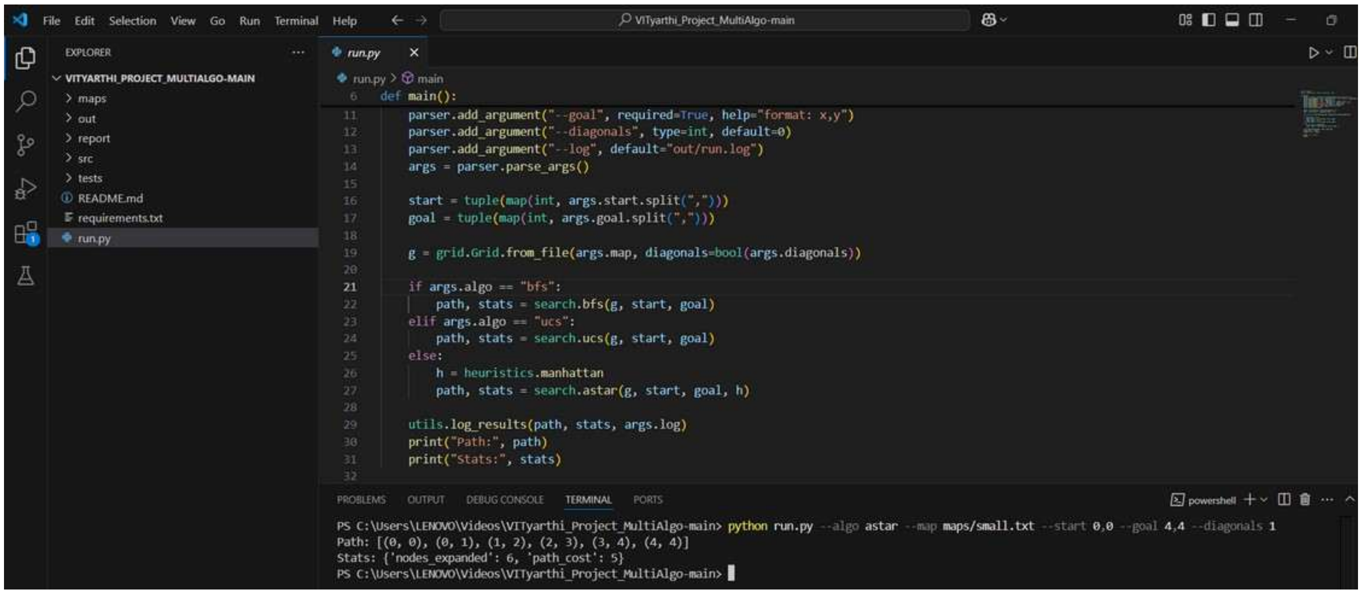


```python
def main():
    parser.add_argument("--goal", required=True, help="format: x,y")
    parser.add_argument("--diagonals", type=int, default=0)
    parser.add_argument("--log", default="out/run.log")
    args = parser.parse_args()

    start = tuple(map(int, args.start.split(",")))
    goal = tuple(map(int, args.goal.split(",")))

    g = grid.Grid.from_file(args.map, diagonals=bool(args.diagonals))

    if args.algo == "bfs":
        path, stats = search.bfs(g, start, goal)
    elif args.algo == "ucs":
        path, stats = search.ucs(g, start, goal)
    else:
        h = heuristics.manhattan
        path, stats = search.astar(g, start, goal, h)

    utils.log_results(path, stats, args.log)
    print("Path:", path)
    print("Stats:", stats)
```

```
PS C:\Users\LENOVO\Videos\VITyarthi_Project_MultiAlgo-main> python run.py --algo ucs --map maps/large.txt --start 0,0 --goal 10,10
Path: [(0, 0), (0, 1), (0, 2), (0, 3), (0, 4), (0, 5), (0, 6), (1, 6), (2, 6), (3, 6), (4, 6), (5, 6), (6, 6), (7, 6), (8, 6), (9, 6), (10, 6), (11, 6),
(12, 6), (12, 7), (12, 8), (11, 8), (10, 8), (10, 9), (10, 10)]
Stats: {'nodes_expanded': 138, 'path_cost': 24}
PS C:\Users\LENOVO\Videos\VITyarthi_Project_MultiAlgo-main>
```

TEST 3 : A* (A STAR) WITH DIAGONALS

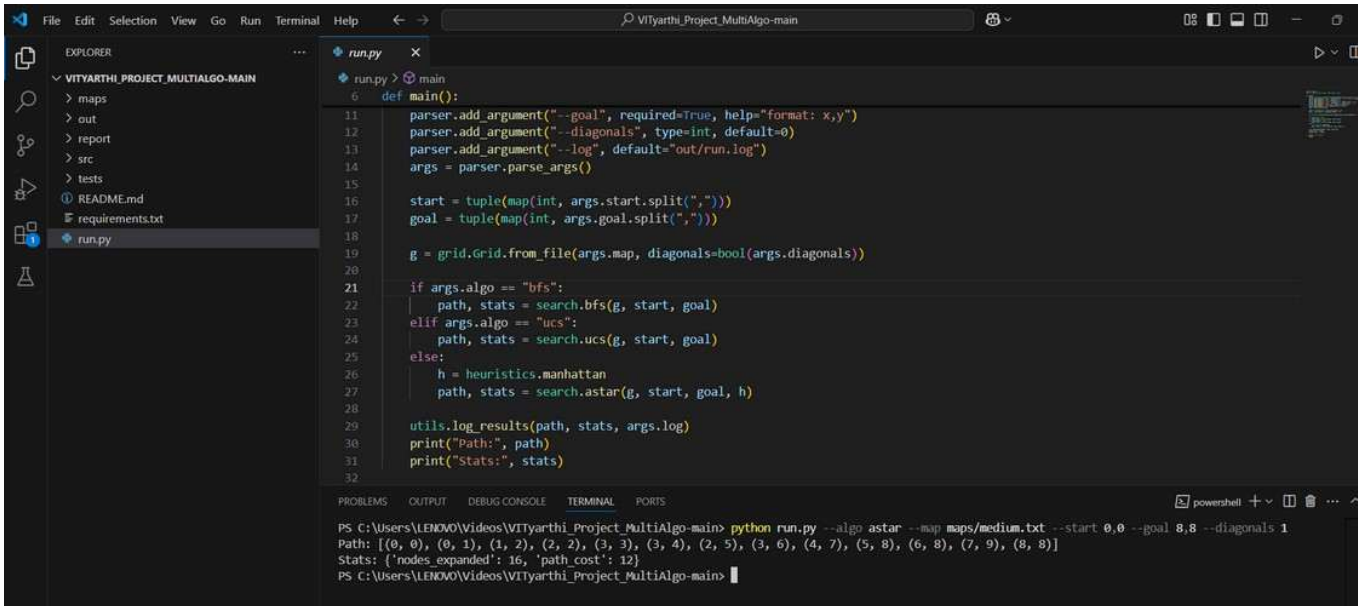
- **SMALL MAP**



```python
def main():
        parser.add_argument("--goal", required=True, help="format: x,y")
        parser.add_argument("--diagonals", type=int, default=0)
        parser.add_argument("--log", default="out/run.log")
        args = parser.parse_args()

        start = tuple(map(int, args.start.split(",")))
        goal = tuple(map(int, args.goal.split(",")))

        g = grid.Grid.from_file(args.map, diagonals=bool(args.diagonals))

        if args.algo == "bfs":
            path, stats = search.bfs(g, start, goal)
        elif args.algo == "ucs":
            path, stats = search.ucs(g, start, goal)
        else:
            h = heuristics.manhattan
            path, stats = search.astar(g, start, goal, h)

        utils.log_results(path, stats, args.log)
        print("Path:", path)
        print("Stats:", stats)
```

```
PS C:\Users\LENOVO\Videos\VITyarthi_Project_MultiAlgo-main> python run.py --algo astar --map maps/small.txt --start 0,0 --goal 4,4 --diagonals 1
Path: [(0, 0), (0, 1), (1, 2), (2, 3), (3, 4), (4, 4)]
Stats: {'nodes_expanded': 6, 'path_cost': 5}
PS C:\Users\LENOVO\Videos\VITyarthi_Project_MultiAlgo-main>
```

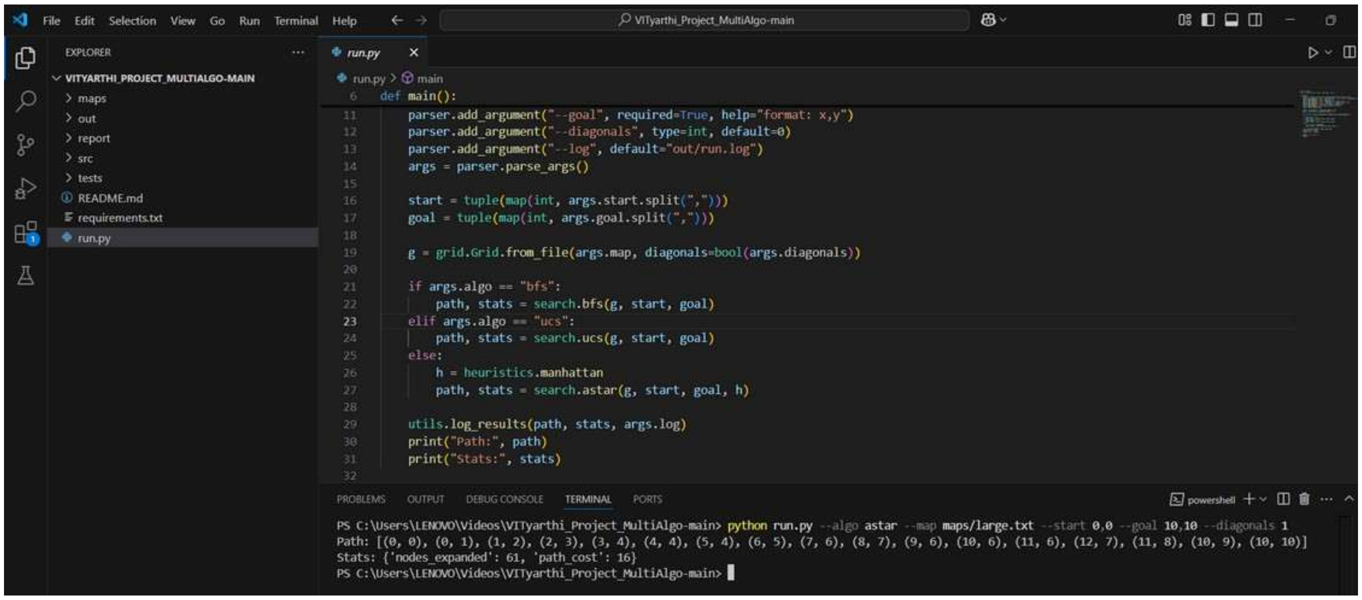
- **MEDIUM MAP**



```python
def main():
        parser.add_argument("--goal", required=True, help="format: x,y")
        parser.add_argument("--diagonals", type=int, default=0)
        parser.add_argument("--log", default="out/run.log")
        args = parser.parse_args()

        start = tuple(map(int, args.start.split(",")))
        goal = tuple(map(int, args.goal.split(",")))

        g = grid.Grid.from_file(args.map, diagonals=bool(args.diagonals))

        if args.algo == "bfs":
            path, stats = search.bfs(g, start, goal)
        elif args.algo == "ucs":
            path, stats = search.ucs(g, start, goal)
        else:
            h = heuristics.manhattan
            path, stats = search.astar(g, start, goal, h)

        utils.log_results(path, stats, args.log)
        print("Path:", path)
        print("Stats:", stats)
```

```
PS C:\Users\LENOVO\Videos\VITyarthi_Project_MultiAlgo-main> python run.py --algo astar --map maps/medium.txt --start 0,0 --goal 8,8 --diagonals 1
Path: [(0, 0), (0, 1), (1, 2), (2, 2), (3, 3), (3, 4), (2, 5), (3, 6), (4, 7), (5, 8), (6, 8), (7, 9), (8, 8)]
Stats: {'nodes_expanded': 16, 'path_cost': 12}
PS C:\Users\LENOVO\Videos\VITyarthi_Project_MultiAlgo-main>
```

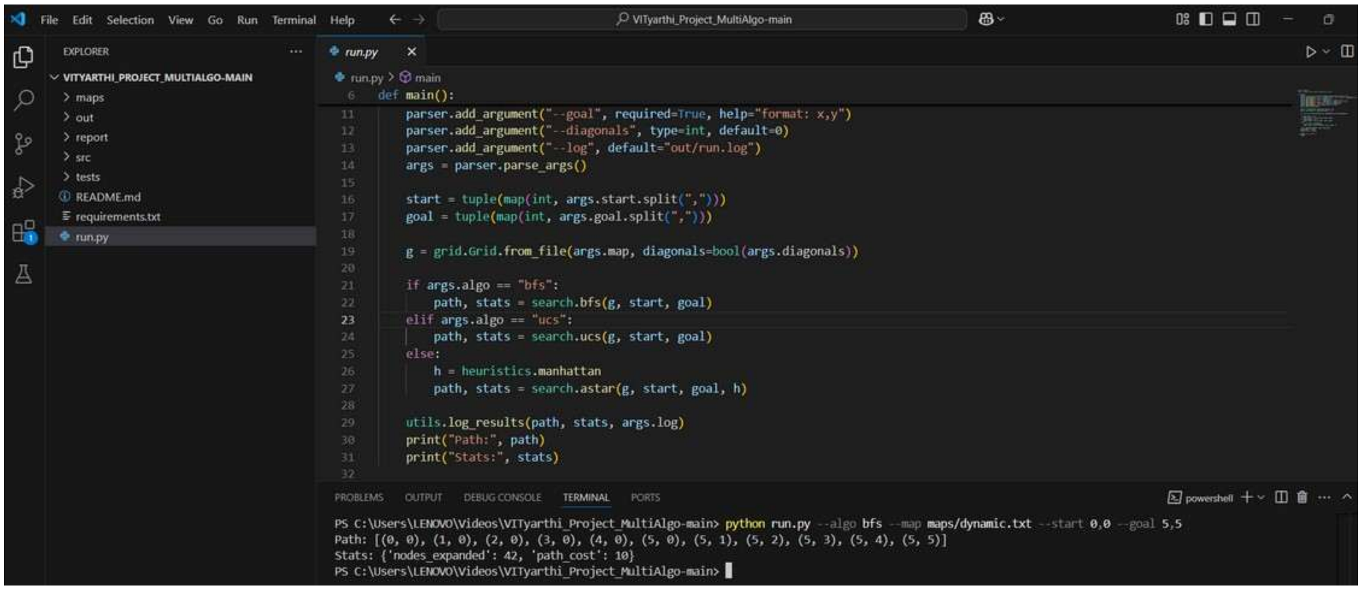
- **LARGE MAP**



```python
def main():
    parser.add_argument("--goal", required=True, help="format: x,y")
    parser.add_argument("--diagonals", type=int, default=0)
    parser.add_argument("--log", default="out/run.log")
    args = parser.parse_args()

    start = tuple(map(int, args.start.split(",")))
    goal = tuple(map(int, args.goal.split(",")))

    g = grid.Grid.from_file(args.map, diagonals=bool(args.diagonals))

    if args.algo == "bfs":
        path, stats = search.bfs(g, start, goal)
    elif args.algo == "ucs":
        path, stats = search.ucs(g, start, goal)
    else:
        h = heuristics.manhattan
        path, stats = search.astar(g, start, goal, h)

    utils.log_results(path, stats, args.log)
    print("Path:", path)
    print("Stats:", stats)
```

```
PS C:\Users\LENOVO\Videos\VITyarthi_Project_MultiAlgo-main> python run.py --algo astar --map maps/large.txt --start 0,0 --goal 10,10 --diagonals 1
Path: [(0, 0), (0, 1), (1, 2), (2, 3), (3, 4), (4, 4), (5, 4), (6, 5), (7, 6), (8, 7), (9, 6), (10, 6), (11, 6), (12, 7), (11, 8), (10, 9), (10, 10)]
Stats: {'nodes_expanded': 61, 'path_cost': 16}
PS C:\Users\LENOVO\Videos\VITyarthi_Project_MultiAlgo-main>
```

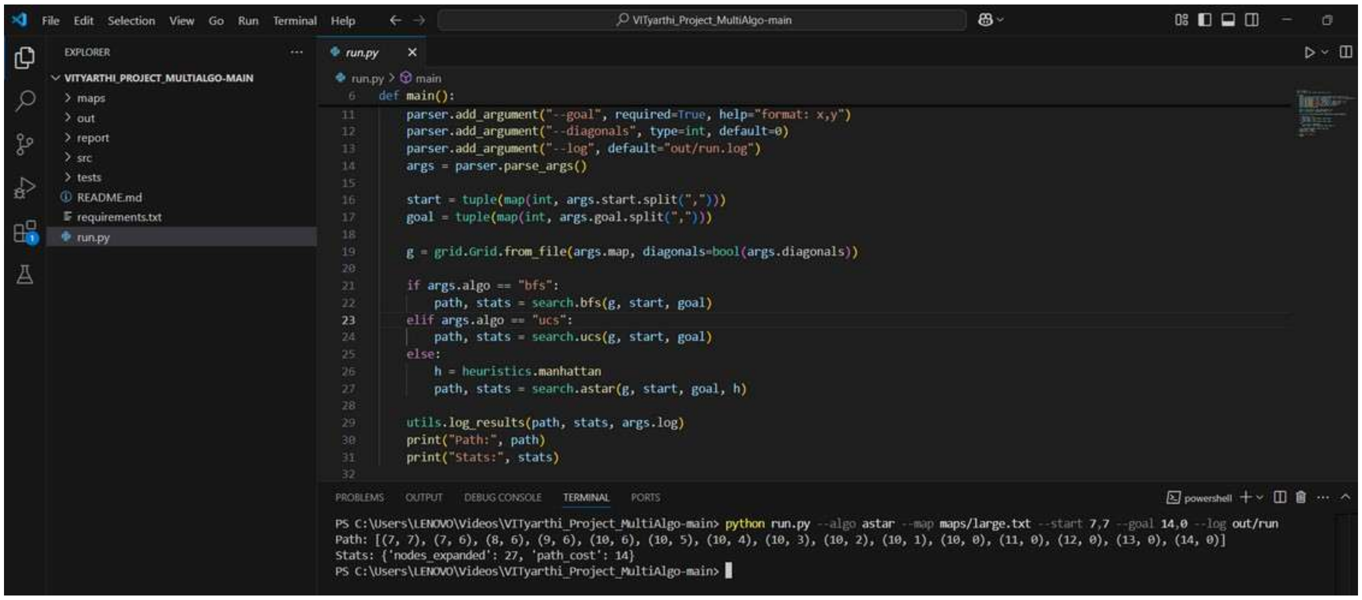
TEST 4 : BFS ON LARGE MAP WITH LOGGING



```python
def main():
    parser.add_argument("--goal", required=True, help="format: x,y")
    parser.add_argument("--diagonals", type=int, default=0)
    parser.add_argument("--log", default="out/run.log")
    args = parser.parse_args()

    start = tuple(map(int, args.start.split(",")))
    goal = tuple(map(int, args.goal.split(",")))

    g = grid.Grid.from_file(args.map, diagonals=bool(args.diagonals))

    if args.algo == "bfs":
        path, stats = search.bfs(g, start, goal)
    elif args.algo == "ucs":
        path, stats = search.ucs(g, start, goal)
    else:
        h = heuristics.manhattan
        path, stats = search.astar(g, start, goal, h)

    utils.log_results(path, stats, args.log)
    print("Path:", path)
    print("Stats:", stats)
```

```
PS C:\Users\LENOVO\Videos\VITyarthi_Project_MultiAlgo-main> python run.py --algo bfs --map maps/dynamic.txt --start 0,0 --goal 5,5
Path: [(0, 0), (1, 0), (2, 0), (3, 0), (4, 0), (5, 0), (5, 1), (5, 2), (5, 3), (5, 4), (5, 5)]
Stats: {'nodes_expanded': 42, 'path_cost': 10}
PS C:\Users\LENOVO\Videos\VITyarthi_Project_MultiAlgo-main>
```

TEST 5: A* ON LARGE MAP, LOG TO CUSTOM FILE


File Edit Selection View Go Run Terminal Help
VITyarthi_Project_MultiAlgo-main
EXPLORER
VITYARTHI_PROJECT_MULTIALGO-MAIN
maps
out
report
src
tests
README.md
requirements.txt
run.py
run.py > main
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
powershell

```python
def main():
        parser.add_argument("--goal", required=True, help="format: x,y")
        parser.add_argument("--diagonals", type=int, default=0)
        parser.add_argument("--log", default="out/run.log")
        args = parser.parse_args()

        start = tuple(map(int, args.start.split(",")))
        goal = tuple(map(int, args.goal.split(",")))

        g = grid.Grid.from_file(args.map, diagonals=bool(args.diagonals))

        if args.algo == "bfs":
            path, stats = search.bfs(g, start, goal)
        elif args.algo == "ucs":
            path, stats = search.ucs(g, start, goal)
        else:
            h = heuristics.manhattan
            path, stats = search.astar(g, start, goal, h)

        utils.log_results(path, stats, args.log)
        print("Path:", path)
        print("Stats:", stats)
```

```
PS C:\Users\LENOVO\Videos\VITyarthi_Project_MultiAlgo-main> python run.py --algo astar --map maps/large.txt --start 7,7 --goal 14,0 --log out/run
Path: [(7, 7), (7, 6), (8, 6), (9, 6), (10, 6), (10, 5), (10, 4), (10, 3), (10, 2), (10, 1), (10, 0), (11, 0), (12, 0), (13, 0), (14, 0)]
Stats: {'nodes_expanded': 27, 'path_cost': 14}
PS C:\Users\LENOVO\Videos\VITyarthi_Project_MultiAlgo-main>
```

NAME : K.BALA YASWANTH

REG.NO : 24MIM10243