EXP : 4

1. Programs on Problem Solving

c. Implement A* algorithm

AIM:

To solve A* algorithm.

CODE:

```
graph = {
    'Start': {'A': 1, 'B': 4},
    'A': {'Goal': 5},
    'B': {'Goal': 1},
    'Goal': {}
}

heuristic = {'Start': 3, 'A': 2, 'B': 1, 'Goal': 0}

def a_star(start, goal):
    open_list = [start]
    came_from = {}
    g = {start: 0}

    while open_list:
        current = min(open_list, key=lambda x: g[x] + heuristic[x])
        open_list.remove(current)

        if current == goal:
            path = []
            while current:
                path.append(current)
```

```
        current = came_from.get(current)
    return path[::-1]

for neighbor, cost in graph[current].items():
    new_g = g[current] + cost
    if neighbor not in g or new_g < g[neighbor]:
        g[neighbor] = new_g
        came_from[neighbor] = current
        open_list.append(neighbor)
```

```
# Run it
print(a_star('Start', 'Goal'))
```

OUTPUT:

['Start', 'B', 'Goal']

RESULT:

Thus the program is compiled and run successfully.