Task 3

i) Breadth First Search guarantees finding the correct number of degrees of separation between any two people in the graph

ii)

```
                   ┌────────┐
                   │  John  │                        level 1
                   └────────┘
              ╱         │        ╲
  ┌──────────┐   ┌──────────────┐   ┌──────────┐
  │ George   │   │  Christine   │   │  Helen   │     level 2
  └──────────┘   └──────────────┘   └──────────┘
       │                │
       │                │
  ┌──────────┐    ┌──────────┐
  │  Mary    │    │  Mary    │                       level 3
  └──────────┘    └──────────┘
       │                │
       │                │
  ┌──────────┐    ┌──────────┐
  │  Peter   │    │  Peter   │
  └──────────┘    └──────────┘
```
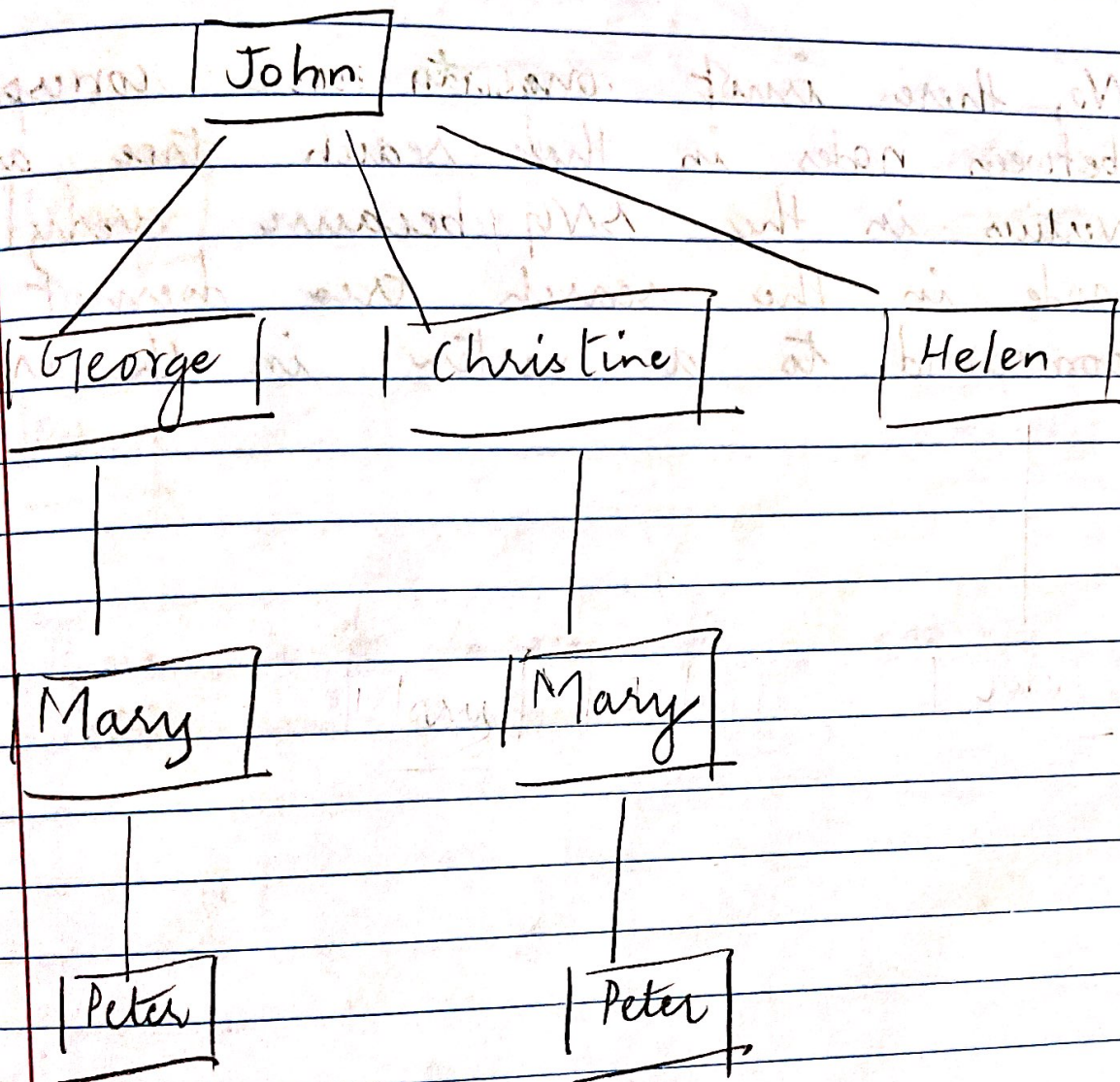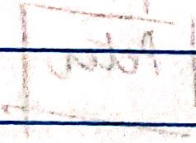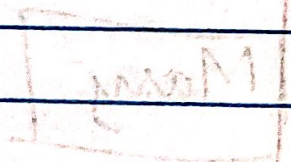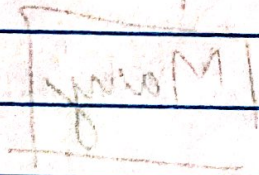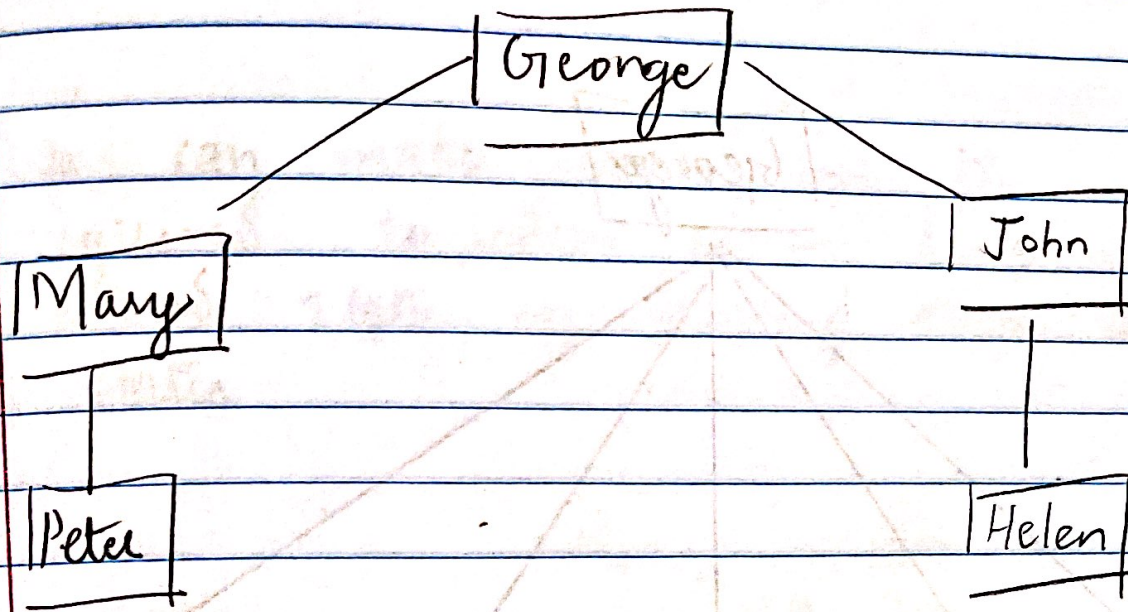
iii)

– No, there isn't one to one correspond
between nodes in the search tree and
vertices in the SNG. because every
node in the search tree doesn't
correspond to a vertex in the SNG.

```
          ┌─────────┐
          │ George  │
          └─────────┘
         /           \
   ┌────────┐      ┌────────┐
   │  Mary  │      │  John  │
   └────────┘      └────────┘
       │               │
   ┌────────┐      ┌────────┐
   │ Peter  │      │ Helen  │
   └────────┘      └────────┘
```
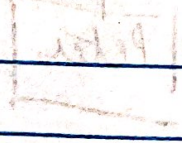
There is 4 degree of separation between Peter and Helen.

George

Mary

John

Peter

Helen

Christine

vi)

We can make sure that the memory required to store search tree node will not exceed 1 GB by keeping track of visiting states