Activity 5:

The user performs the stack operation by pushing the values from 0 to 9. Here is the sequence of pop operations of that stack. We need to check which of the following are possible or which not.

1. 4 3 2 1 0 9 8 7 6 5

This sequence is possible. He performed sequence of operations like :

1. Push (0);
2. Push (1);
3. Push (2);
4. Push (3);
5. Push (4);
6. Pop ();
7. Pop ();
8. Pop ();
9. Pop ();
10. Pop ();
11. Push (5);
12. Push (6);
13. Push (7);
14. Push (8);
15. Push (9);
16. Pop ();
17. Pop ();
18. Pop ();
19. Pop ();
20. Pop ();
21. 4 6 8 7 5 3 2 9 0 1

This sequence is not possible because he performed sequence of operations like :

1. Push (0);
2. Push (1);
3. Push (2);
4. Push (3);
5. Push (4);
6. Pop ();
7. Push (5);
8. Push (6);
9. Pop ();
10. Push (7);
11. Push (8);
12. Pop ();
13. Pop ();
14. Pop ();
15. Pop ();
16. Pop ();
17. Push (9);
18. Pop ();
19. Pop ();

In above operation, the top of the stack is 1 , so it will pop 1 but in the given string it is 0. So, this sequence is not possible.

1. 2 5 6 7 4 8 9 3 1 0

This sequence is possible. He performed sequence of operations like :

1. Push (0);
2. Push (1);
3. Push (2);
4. Pop ();
5. Push (3);
6. Push (4);
7. Push (5);
8. Pop ();
9. Push (6);
10. Pop ();
11. Push (7);
12. Pop ();
13. Pop ();
14. Push (8);
15. Pop ();
16. Push (9);
17. Pop ();
18. Pop ();
19. Pop ();
20. Pop ();
21. 4 3 2 1 0 5 6 7 8 9

This sequence is possible. He performed sequence of operations like :

1. Push (0);
2. Push (1);
3. Push (2);
4. Push (3);
5. Push (4);
6. Pop ();
7. Pop ();
8. Pop ();
9. Pop ();
10. Pop ();
11. Push (5);
12. Pop ();
13. Push (6);
14. Pop ();
15. Push (7);
16. Pop ();
17. Push (8);
18. Pop ();
19. Push (9);
20. Pop ();
21. 1 2 3 4 5 6 9 8 7 0

This sequence is possible. He performed sequence of operations like :

1. Push (0);
2. Push (1);
3. Pop ();
4. Push (2);
5. Pop ();
6. Push (3);
7. Pop ();
8. Push (4);
9. Pop ();
10. Push (5);
11. Pop ();
12. Push (6);
13. Pop ();
14. Push (7);
15. Push (8);
16. Push (9);
17. Pop ();
18. Pop ();
19. Pop ();
20. Pop ();
21. 0 4 6 5 3 8 1 7 2 9

This sequence is not possible because he performed sequence of operations like :

1. Push (0);
2. Pop ();
3. Push (1);
4. Push (2);
5. Push (3);
6. Push (4);
7. Pop ();
8. Push (5);
9. Push (6);
10. Pop ();
11. Pop ();
12. Pop ();
13. Push (7);
14. Push (8);
15. Pop ();
16. Pop ();

In above operation, the top of the stack is 7 , so it will pop 7 but in the given string it is 1. So, this sequence is not possible.

1. 1 4 7 9 8 6 5 3 0 2

This sequence is not possible because he performed sequence of operations like :

1. Push (0);
2. Push (1);
3. Pop ();
4. Push (2);
5. Push (3);
6. Push (4);
7. Pop ();
8. Push (5);
9. Push (6);
10. Push (7);
11. Pop ();
12. Push (8);
13. Push (9);
14. Pop ();
15. Pop ();
16. Pop ();
17. Pop ();
18. Pop ();
19. Pop ();

In above operation, the top of the stack is 2 , so it will pop 2 but in the given string it is 0. So, this sequence is not possible.

1. 2 1 4 3 6 5 8 7 9 0

This sequence is possible. He performed sequence of operations like :

1. Push (0);
2. Push (1);
3. Push (2);
4. Pop ();
5. Pop ();
6. Push (3);
7. Push (4);
8. Pop ();
9. Pop ();
10. Push (5);
11. Push (6);
12. Pop ();
13. Pop ();
14. Push (7);
15. Push (8);
16. Pop ();
17. Pop ();
18. Push (9);
19. Pop ();
20. Pop ();