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ROLL NUMBER: 546

COURSE: MSc CS

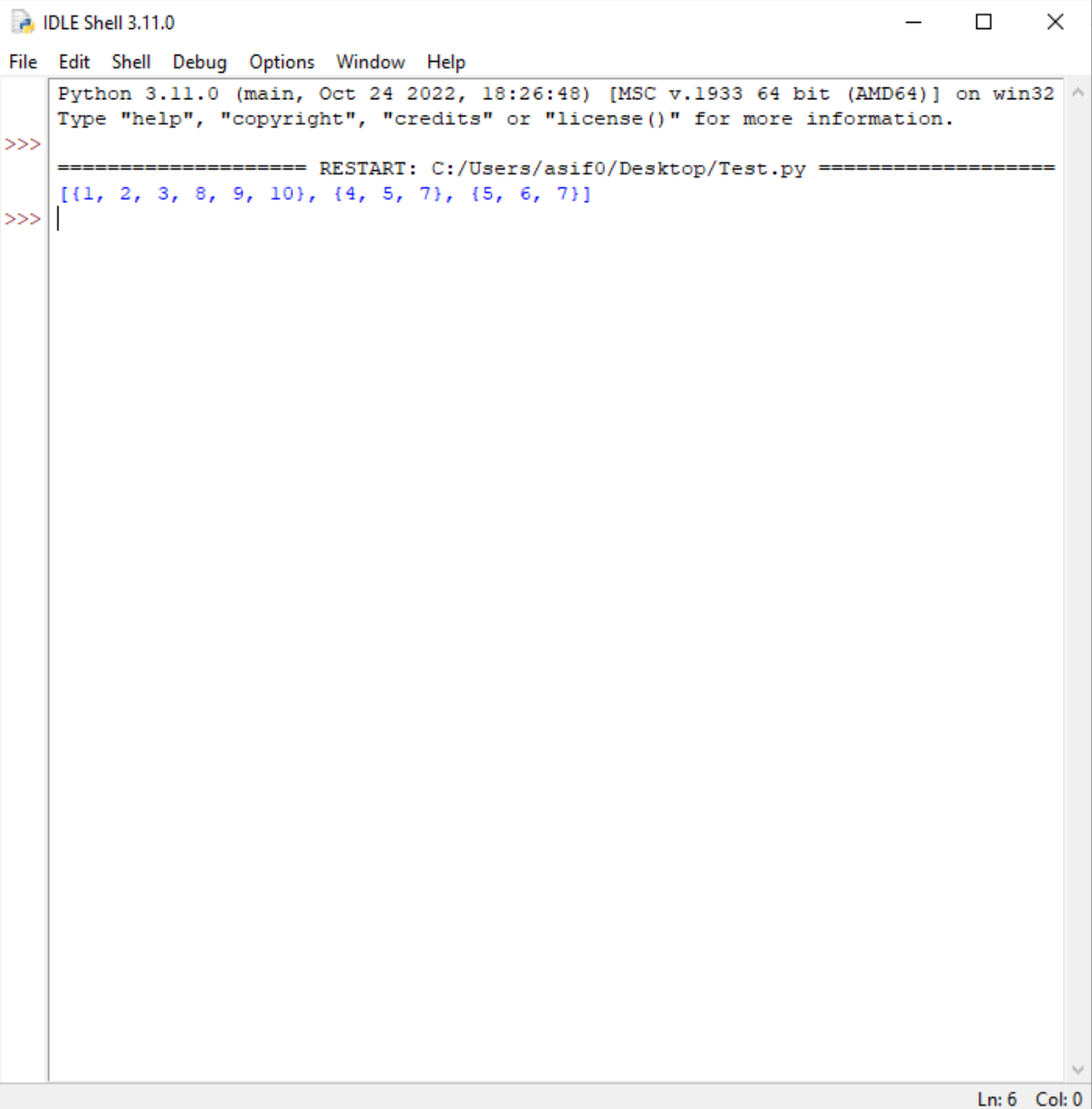
SUBJECT: ALGORITHM

**TOPIC: SET COVERING
PROBLEM**

PRACTICAL 7

```
def set_cover(universe, subsets):  
    """Find a family of subsets that covers the universal set"""  
    elements = set(e for s in subsets for e in s)  
    # Check the subsets cover the universe  
    if elements != universe:  
        return None  
    covered = set()  
    cover = []  
    # Greedily add the subsets with the most uncovered points  
    while covered != elements:  
        subset = max(subsets, key=lambda s: len(s - covered))  
        cover.append(subset)  
        covered |= subset  
  
    return cover  
  
def main():  
    universe = set(range(1, 11))  
    subsets = [set([1, 2, 3, 8, 9, 10]),  
               set([1, 2, 3, 4, 5]),  
               set([4, 5, 7]),  
               set([5, 6, 7]),  
               set([6, 7, 8, 9, 10])]   
    cover = set_cover(universe, subsets)  
    print(cover)  
  
if __name__ == '__main__':  
    main()
```

OUTPUT:



The image shows a screenshot of the Python IDLE Shell 3.11.0 window. The title bar at the top reads "IDLE Shell 3.11.0" and includes standard window controls (minimize, maximize, close). Below the title bar is a menu bar with the following options: File, Edit, Shell, Debug, Options, Window, and Help. The main text area contains the following text:

```
Python 3.11.0 (main, Oct 24 2022, 18:26:48) [MSC v.1933 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.

>>>
===== RESTART: C:/Users/asif0/Desktop/Test.py =====
[{1, 2, 3, 8, 9, 10}, {4, 5, 7}, {5, 6, 7}]
>>> |
```

The text is displayed in a monospaced font. The prompt characters ">>>" are in red. The output line is in blue. A vertical cursor is visible on the line following the output. At the bottom right of the window, the status bar shows "Ln: 6 Col: 0".