Computational Thinking

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Tutorial on answering subpart pseudocode questions based on lists

We have a new table containing information of 1000 books for a library. In the procedure given below, the parameter **books** is list sorted in an ascending order based on the number of pages. Each element in **books** corresponds to a book from the library and is represented by a list [SeqNo, Pages]. **X** is a row from the table.

```
1   Procedure Insert(X, books)
2       sBooks = [ ]
3       inserted = False
4       foreach Y in books {
5           if (X.Pages <= last(Y) and not(inserted)) {
6               sBooks = sBooks ++ [[X.SeqNo, X.Pages]]
7               inserted = True
8           }
9           sBooks = sBooks ++ [Y]
10      }
11      if (not(inserted)) {
12          sBooks = sBooks ++ [[X.SeqNo, X.Pages]]
13      }
14      return (sBooks)
15  End Procedure Insert
```

Q1: **Z** is some arbitrary value containing a book's details. Consider the following code:

```
someBooks = [ ]
someBooks = Insert(Z, someBooks)
```

Which of the following lines in the procedure **Insert** will be executed during the above call? It is a Multiple Select Question (MSQ).

- ❑ Line 5
- ❑ Line 6
- ❑ Line 7
- ❑ Line 9
- ❑ Line 12
- ❑ No lines. An empty list cannot be passed as a parameter to the procedure.

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12          sBooks = sBooks ++ [[X.SeqNo, X.Pages]]
13      }
14      return (sBooks)
15  End Procedure Insert
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Q2: **Z** is a row in the table with the following data: **Z**.SeqNo is 12 and **Z**.Pages is 350.
What will be the contents of the list **someBooks** at the end of execution of the following code?

someBooks = [[5, 220], [10, 350], [15, 350], [20, 400]]
someBooks = Insert(Z, someBooks)

- [[5, 220], [10, 350], [15, 350], [20, 400]]
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Q3: Execute the following pseudocode on the “Library” table. Which of the following statements are true after execution? It is a Multiple Select Question (MSQ).

```
books = [ ]
while(Table 1 has more rows) {
    Read top row X from Table 1
    books = Insert(X, books)
    Move X to Table 2
}
```

- ❑ first(books) corresponds to a book having the least number of pages in the library.
- ❑ first(books) corresponds to a book having the most number of pages in the library.
- ❑ last(last(books)) is the most number of pages among all the books in the library.
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