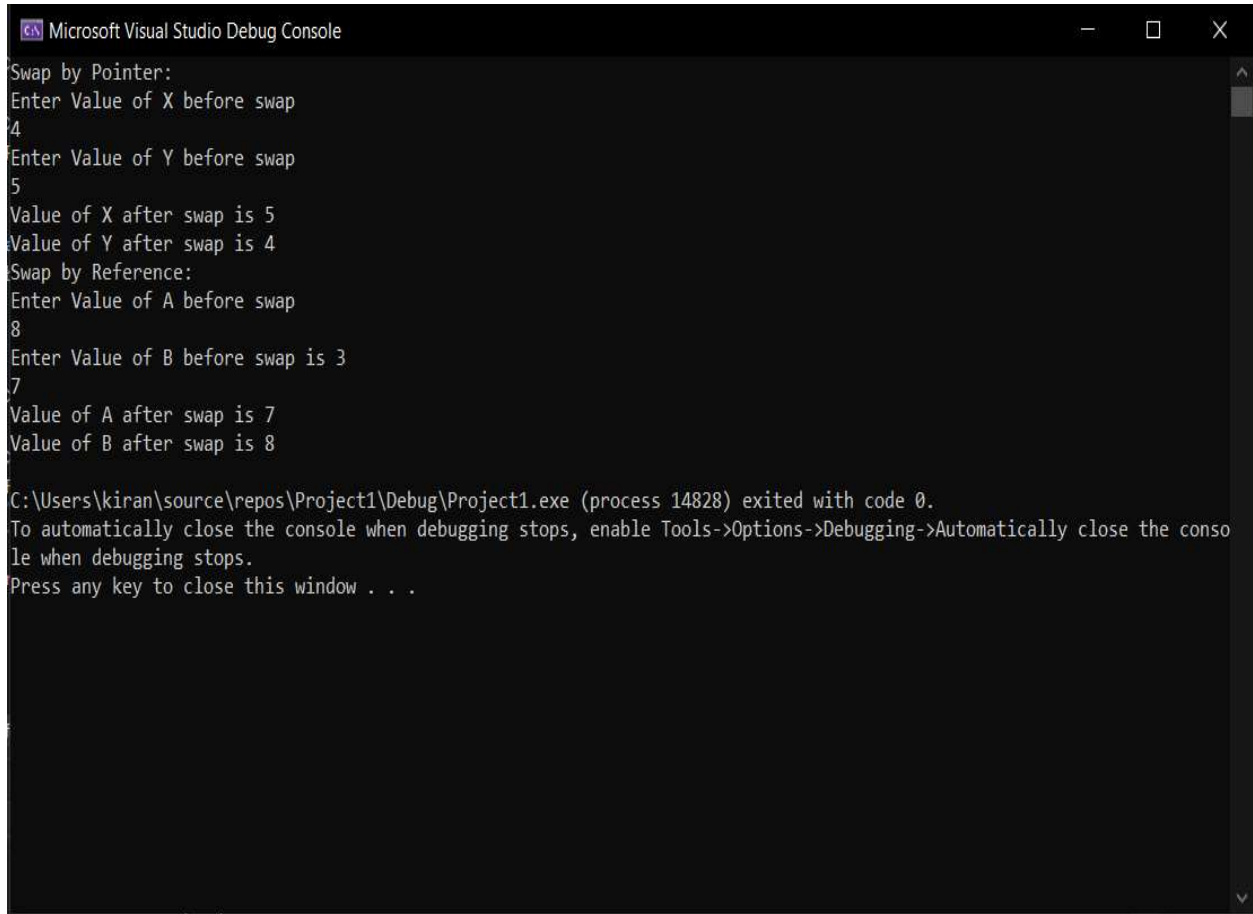


EECE 7205 : Fundamentals of Computer Engineering

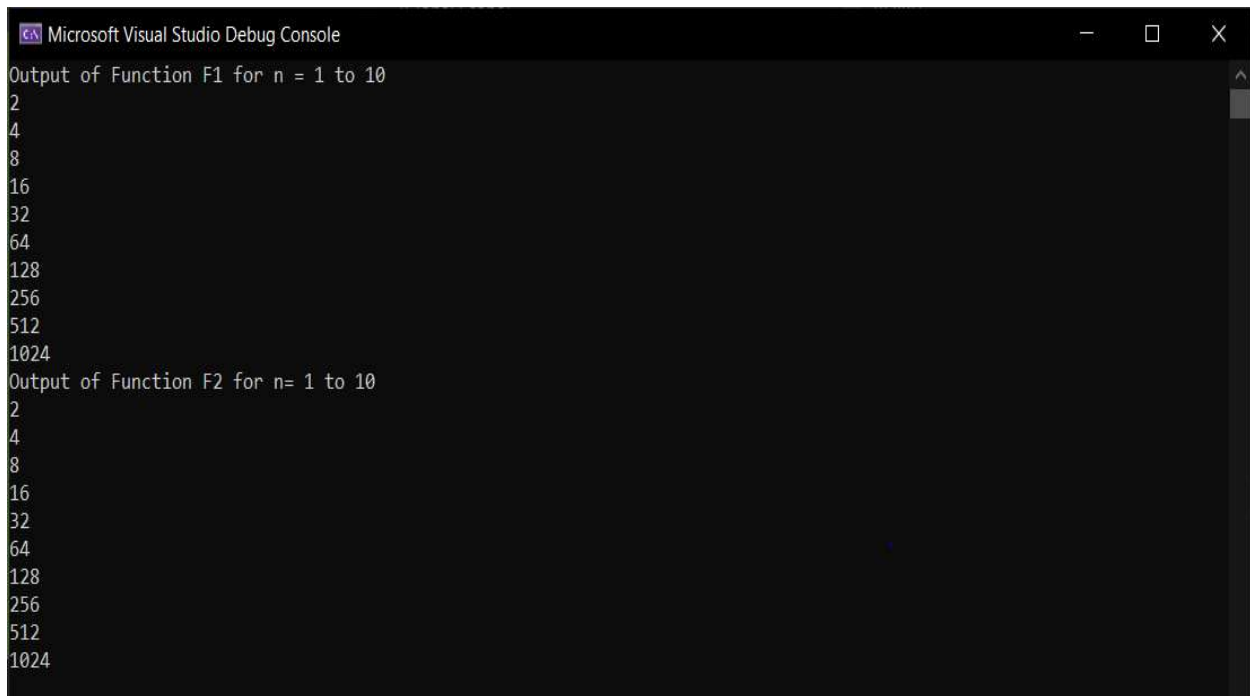
Question 1 :

SwapP and SwapR:

A screenshot of the Microsoft Visual Studio Debug Console window. The window has a title bar with the Visual Studio logo and the text "Microsoft Visual Studio Debug Console". The console output shows the execution of a program that demonstrates swapping values using pointers and references. The output is as follows:

```
Swap by Pointer:  
Enter Value of X before swap  
4  
Enter Value of Y before swap  
5  
Value of X after swap is 5  
Value of Y after swap is 4  
Swap by Reference:  
Enter Value of A before swap  
8  
Enter Value of B before swap is 3  
7  
Value of A after swap is 7  
Value of B after swap is 8  
  
C:\Users\kiran\source\repos\Project1\Debug\Project1.exe (process 14828) exited with code 0.  
To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the console when debugging stops.  
Press any key to close this window . . .
```

Question 2:



```
Microsoft Visual Studio Debug Console
Output of Function F1 for n = 1 to 10
2
4
8
16
32
64
128
256
512
1024
Output of Function F2 for n= 1 to 10
2
4
8
16
32
64
128
256
512
1024
```

a. What does each function do?

Answer :

Both the Functions return Power of 2 using recursion. Implies they return 2^n . For e.g.: if value of $n=4$ implies $2^4 = 16$ therefore the functions will return 16.

b. Which function is faster?

Answer:

Function F2 is faster than F1. If we increase value of n to say 40, we can see difference in execution time of each function. Function F2 is considerably faster than F1.

c. Explain why one function is faster than the other?

Answer:

Function F1 is slower as compared to F2 because it is called a greater number of times. For e.g. if we take $n=4$. Then Function $F1(4)$ will return $F1(3)+F1(3)$, now each $F1(3)$ will return $F1(2)*F1(2)$ and so on. In total F1 will be called 31 times.

Whereas in case of $F2(4)$ it will return $result*result$ where $result = F2(2)$ which is called only once. After that F2 is called two more times. F2 will be called 4 times in total.

Therefore, F2 is Faster than F1.

Question 3:

```
Microsoft Visual Studio Debug Console
Enter total number of students:
8
Enter Student 1 Last name: Tulsulkar
Enter Student 1 score(0-100): 85
Enter Student 2 Last name: Rane
Enter Student 2 score(0-100): 88
Enter Student 3 Last name: Chopade
Enter Student 3 score(0-100): 75
Enter Student 4 Last name: Gupta
Enter Student 4 score(0-100): 92
Enter Student 5 Last name: Sanghani
Enter Student 5 score(0-100): 74
Enter Student 6 Last name: Tupe
Enter Student 6 score(0-100): 68
Enter Student 7 Last name: Wadhwani
Enter Student 7 score(0-100): 90
Enter Student 8 Last name: Deshpande
Enter Student 8 score(0-100): 99
Entered Data:
Student Last Name -- Student Score
Tulsulkar--85
Rane--88
Chopade--75
Gupta--92
Sanghani--74
Tupe--68
Wadhwani--90
Deshpande--99
```

Entered Data

```
Arranged Data in Descending Order:
Student Last Name -- Student Score
Deshpande--99
Gupta--92
Wadhwani--90
Rane--88
Tulsulkar--85
Chopade--75
Sanghani--74
Tupe--68
```

Data Sorted by Insertion Sort