

North South University
Department of Electrical and Computer Engineering
Assignment 01 –Spring 2023
CSE 225 - Data Structures and Algorithms; Section-03

1. Observe the code below:

```
1. int main(void)
2. {
3.   int a = 40;
4.   int b=25;
5.   int* ptr=&a;
6.   proc1 (&a);
7.   proc2(b);
8.   *ptr=67;
9.   std::cout << a<< '\n';
10.  std::cout << &a<< '\n';
11.  std::cout << b<< '\n';
12.  std::cout << &b<< '\n';
13.  std::cout << ptr<< '\n';
14.  std::cout << *ptr<< '\n';
15.  std::cout << &ptr<< '\n';
16.  return 0; }

17. void proc1(int* i)
18. { *i = 15; }

19. void proc2(int& i)
20. { i = 15; }
```

Explain the lines of code in detail. And what will be the output and why?

2. Explain the code in detail. Explain the output.

```
1. int* createIntArray() {  
2. int* ptr = new int[5];  
3. return ptr;  
4. }  
5. int main() {  
6. int* arrayPtr = createIntArray();  
7. delete[] arrayPtr;  
8. std::cout << "Value of arrayPtr[0]: " << arrayPtr[0] <<  
   std::endl;  
9. return 0;  
10. }
```

3. In terms of search efficiency, what are the advantages and disadvantages of using a sorted list over an unsorted list?
4. Use the binary search algorithm and search for '56' and '72' in the given list. When do you know that your search is over?

12	23	29	56	78	91	98	103	110
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Can you apply Binary search algorithm in an unsorted list, explain your answer.

5. Write an algorithm to delete an item from a sorted list. You can use array or linked list based implementation.
6. Implement stack data structure using linked list. The following functions must be included:
MakeEmpty(), IsEmpty(), IsFull(), Push(), Pop(), Top().

A list of what each function does is given below:

MakeEmpty()	Makes the stack empty
IsEmpty()	Checks whether the stack is empty
IsFull()	Checks whether the stack is Full
Push()	Pushes an item into the stack
Pop()	Pops an item from the stack
Top()	Returns the last inserted item, without changing anything