CSCI-1411 Fundamentals Of Computing Lab

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Lab 9: Pointers

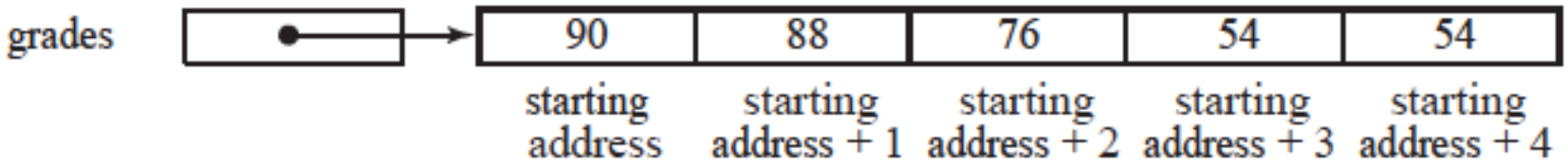
	* Symbol	& Symbol
1.	Define a pointer int *ptr;	Indicate a parameter passed by reference in a function heading
2.	Get the contents of the memory location pointed to by a pointer variable cout << *ptr;	Get the address of the variable cout << &var;

```
float * pointer;
float pay = 3.75
pointer = &pay;

cout << pointer << *pointer;
cout << &pay << pay;
```

Lab 9: Pointers

- Arrays & Pointers:
  - When passed to functions, arrays are passed by pointer.
  - An array name is a pointer to the beginning of the array.



  - Access of an individual element of an array through an index is done by pointer arithmetic.

```
cout << grades[0] << *grades;
cout << grades[2] << *(grades + 2);
```

Lab 9: Pointers

- Dynamic Variables:
  - In previous lab, an array is defined with a given fixed size which should be estimated
    - If the size defined is smaller than is needed, there is not enough memory to hold all of the elements.
    - If the size defined is larger than is needed, memory is wasted.

➔ Dynamic variables allow to dynamically allocate enough memory for an array but the memory is not wasted.

  - Using operators **new** (to allocate) and **delete** (to deallocate dynamic variables).

```
float *grades;
grades = new float[numOfGrades];
delete [ ] grades;
```

Lab 9: Pointers

- Overview:
  - Lab 9 Components
    - Lab Sections (9.1, 9.2, 9.3, 9.4)

Lab 9: Pointers

- 9.1 Introduction to Pointer Variables
  - (pointers.cpp)
  - Answer questions asked in exercise 2
- 9.2 Dynamic Memory
  - (dynamic.cpp)
  - Match the provided output
  - Answer questions asked in exercise 2
- 9.3 Dynamic Arrays
  - (darray.cpp)
  - Match the provided output
- 9.4 Choose your own adventure
  - Name the source file: main.cpp
  - No design document required

Lab 9: Pointers

- Submission File Checklist
  - Submit all files on Canvas (One at a time or all of them in a single zip file). Be sure to include all source files and documents.

  - 9.1 pointers.cpp
  - 9.2 dynamic.cpp
  - 9.3 darray.cpp
  - 9.4 main.cpp (For one of the three options)