IQRA NATIONAL UNIVERSTY
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B.tech CivPl

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Final Term

PAPER COMPUTER APPLICATION

Question No 1

PART "A"

What is the need of files and stream in c++.

Files and Stream

All the programs we have looked at so far use input only from the keyboard and out put only to the screen. If we were restricted to use only the keyboard and screen as input and output device it would difficult to handle large amount of input data and out put would always be lost as soon as we turned the Computer off. To avoid these problem. we can store data some secondry storage device, usally magnetic type or discs. Data can be created by one program stored on these device and than accessed or modified by other program when necessary To achive this data is packed up to on the storage device as data structure called Fieles

PART "B"

Stream Created

Before we can use a output stream program we must "creat" it statement to creat stream look like varible declarction and are usally placed at the top of program or function implementation alongs with the varible declaration So for example

ofstream in_stream
ofstream out_stream.

respectively ercate a stream called in "stream" belonging to the class ~~of stream~~ (like type) if stream (input-file-stram) and stream called "out stream" belonging to the class "of stream" (output-file stream) Howere the analogy blw stream and ordinay varible (of type "int", "char." etc can't be taken to for. we cannot for example use simple assigment statements with stream (e.g we can't just write 'in stream = in_stream).

Function role play in file and stream.

Having creat a stream called in "stream" and

we can connect it to file using the member function "open(---)". (we have already come across some member function for output stream such as "precision(---)" and "width(---)" in feature 2.) The function "open(---)" has different effect for ifstream than for of istream (i.e the function in polymorphic.

To connect the istream 'in stream" in the file "feature 4" diagramitically. we use the following statement.

in-stream open (feature 4");-

This connect "in stream to the following of 'feature 4' diagramatically, we end up in the following situation.

Question No 2
Part "A"

Failure with File Command

File operation such as opening and closing files are a notorious source of errors. Robust Commerical program should always include some check to make sure that file operation have Completed Successfully. and error handling routines in case they haven't A simple checking mechanism is provided by number function "fail()" The function call in stream fail():
return true if the perviews stream operation on "in-stream" was not Seccesful (perhaps we tried to open a file which didn't exist) if a failure has occurred "in-stream" may be in Completed stat in the best not to attempt any more operation with it

PART 'B"

Expression.

* [7>=7] && [7>4] False ✗
* [6>=6] || [5>3] False ✗
* [9!=9] True ✓
* [5>3] && [6>=6] || [5!=6] True ✓
* [5<3] && [[6<=6] || [5!=6]] False ✗

Question No 3
PART "A"

Different b/w array and string?

Although we have already seen how to store large amount of data in file we have as yet no convenient way manipulate such data from with program For example we might want to right a program that input and then ranks a ~~station~~ sorts a long list number C++ provide a structured data type called array to facilitate this kind of task. The use of array permits us to asid a group of memory location (i.e a group of variable) that we can then manipulate as single entity but that it the same time give direct access to any individual component Arrays are simple example of structured data type they effecively just list of variable all of same data type

"int, char or (whatever) later in the same course you will learn how to construt more complicated compound data structure.

→ String are similar to array with just a few different usally the array size is fixed while stright can have a vorible number of element Arrays can contain any data type (inar short int even array) while strings are usally ASCI charters jeminted with a Null 0 charaters.

Question No 3
part "B"

Function work as an arry parmeter.

Function Can be used array parmator to maintain a structered design. Here is definition of an example function which returns the avorge hours worked given an array of type Hours arry from program 6.11 "Hours_arry" from program 6.11

```
float averge (Hours arry hrs)
{ float total = 0
  int count;
for(Coun = 0 Count < NO_OF
      EMPLOYEES Count++)

  total += float hrs (Count);

return (total / NO_OF - EMPLOYEES)
```

An array an a function element.

Array are always passed data-by-pointer function which means that array argument can pass data into function or both in out or function.

Question No 4

PART A

array be Sorted

→ A Sorted array is an array data structure in which each element is sorted in numerical alphabetical or some other and placed at equally spaced address in Computer memory. It is typically used in Computer science to importance to implement static lookup tables to hold multiple value which have the same data type.

→ Arrays often need to be sorted in either ascending or decending order. There are many will know method method for doing this the exist quick short algorithm is among the most effient this section briefly describe one of the exist sorting method called the selection Sort.

This basic idea of selection short is For each index position. I in turn:

→ Find the smallest data value in the array from position I to (length-1) when "length" in the number of data value stored

→ Exchange the smallest value with value of position I.

To see how selection work consider work an any array of five integre value declared a int a[5]. and initially in the order.

→ Array can have more than one dimension. In this section we briefly exmine these use of two dimensional array to respresent two dimensional structure such as screen bitmaps or nxm matrix of integes.

→ A bitmap consist of a grid of Boolean value represent of these stat of the dots or pixel on a screen.

Ture' mean 'on' or the pixel in white "False" mean "off" or the pixel in the black

Let Suppose the screen in 639 pixel wide and 449 pixel high.

we can declare the corrsponding array as followrs.

Question No 5

PART 'A'

Array variable and pointer Arithemic

Array variable:-

An array is a varible containing multiple value. Any variable may used as an array there is no mixiumum limit to the size of an array not requriirement that member varible be indexed or assigned contigously. Array are zero based the first element is indexed with the number 0.

Indrect declaration is done using the following syntx to declare a varible.

Pointer Arithemetic

pointers do not have to point to single varible they can also point at the cells of an array For example

and we would end up with 'p' pointing at the fourth cell of the array a (remember array are 0 based so [0] in the first cell) we would allustrate the situation like this:

PART 'B"

linked List

In this section a brief description is given of an abstract data type (ADT) called as linked list which of interest here because it is implemented using pointer [illegible] learn much more about abstract data types in general later in the course

In the impleemenatation given below a linked list

Consist of series of nodes each containing some data Each node also contain a pointer pointing to the next node list. there is an addional seperate pointer which point to the first node and the pointer in the list node simply point "Null" The advantage of linked list over (for example) array is that individual nodes can be added or deleted dynamically at the begining at the end or the middle of the list.