

MIDTERM EXAM 1

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CSCI 135

NAME: FIRST LAST

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1. (12%) Suppose your program has the following declarations to represent information about a book:

```
string title;  
int year_published;  
bool paperback; //true if paperback, false if hardcover
```

Write C++ logical conditions corresponding to each of the following sets. Your answers should be as compact as possible and cover all cases.

- (a) All paperbacks published after 1995 and before 2006.
- (b) All hardcover books, whose title starts with the letter 'A' or letter 'T', published in 2008 or later.
- (c) All hardcover books, published last year, whose title ends with the letter 's' ("Birds", "Luminaries", etc).

2. (10%) Write a C++ function that calculates: $\frac{(1+n)^k}{\sqrt{k+1}}$

3. (18%) Consider the following program fragment:

```
void foo(int v, int & r);

int main()
{
    int v = 0; //SPECIAL LINE
    int r = 0;
    for (int i = 0; i < 2; i++)
    {
        foo(v, r);
        cout << v << " " << r << endl;
    }
    return 0 ;
}

void foo(int v, int & r)
{
    static int s = 0;
    s = s + 1;
    v = v + s;
    r = r + s;
}
```

(a) What does the program output?

(b) Underline all formal parameters in the program.

(c) Circle all actual arguments in the program.

(d) Draw a dashed box around all prototypes in the program.

(e) Draw a solid box around the scope of the variable declared on `//SPECIAL LINE` ?

(f) What is the value of variable `s` at the end of program execution - just before the `main()` function returns?

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4. (15%) Write a function: `void remove_e(string & sentence)` that removes all occurrences of letter 'e' from string `sentence` in place: in its original memory location in the caller function.

5. (15%) Write a program that asks user for a positive integer side length. If they enter an illegal value, they must be prompted to enter a good one until they do. It then displays a rectangle of the given side length, made up of alternating horizontal lines of o's and x's. For example, if the side length is 5, the program should display:

```
o o o o o
x x x x x
o o o o o
x x x x x
o o o o o
```