CS 111

writing functions

Creating title lines

1. What type of answer does it calculate?
2. How many parameters does it use?
3. What are the types of those parameters?

```
int main(){
   bool b=true; int i=1; double d=0; string s=“”; char c=‘1’;
   cout << function(function(b, s, c), “Hello”, c) << endl;
   return 0;
}
```

Creating title lines

```
int main(){
    string name = “John”;
    char initial = ‘Q’;
    int age = 20;
    double rating = doSomething(name, initial, name, age, age + 10);
    cout << rating << endl;
    return 0;
}
```

Model for function

A function is coded with the following model:

```
TITLE LINE {
    BLOCK OF C++ CODE
}
```

Model for C++ program with function

```
#include<iostream>
using namespace std;

CODE FOR THE FUNCTION

CODE FOR MAIN
```

Advice for writing functions

- Plan a main program that uses your function before writing the function
- For planning and testing purposes it is best to think of a very simple task that tests a function
- This should be as simple as possible so that any problems that turn up are highlighting problems in our function code

Example 1

- Goal: Write a function `tax`.
- The function is told a cost in dollars and returns the tax to add on at 5% for the first $100 and 6% on any amount over $100.
- Question: What would be a simple task for testing this function?

Example 1

- A simple task to test this tax function would be to print the tax on a $100 purchase
  - We can expect an answer of 5
- Tasks should be chosen so that we can easily predict the output

Example 1

- Next, write a main program to carry out this task (including calling the function)

```
int main(){
    cout << tax(100) << endl; // expect to see 5 printed
    return 0;
}
```

Example 1

```
int main(){
   cout << tax(100) << endl; // expect to see 5 printed
   return 0;
}
```

1. What is the name of the function?
2. Does the function have parameters? How many? What type?
3. Does the function return an answer? What type?

Use your answers to these three questions to write a title line

Example 1

- What is the plan for the function's code block?
- There must be some sort of decision; this implies an if statement

If cost < 100: return 5% of cost
Else return 5% of 100 and 6% of cost – 100

- Turn the title line and plan above into code
- Compile and test using your simple main function
- Test other sensible inputs to verify your function is working

Writing functions

- Functions should be tested individually as soon as they are written
- The testing should be as simple as possible so that any problems can only come from the function
- Fix the problems before starting to think about any other function