

**CMPS 150 – Sections 3 & 4 – 11:00 am**  
**Fall 2002 – Test #1**

Name: \_\_\_\_\_ KEY \_\_\_\_\_

Date: Friday, Sept. 20, 2002

Section: **3**

1. On planet Ucs there are only 4 months. The month names and the number of days in each are:

Janfebarch 31  
Apmajune 30  
Julausept 30  
Octnodec 31

Write a program fragment that will ask the user for the day of the year, and respond with the correct month and day. For example, one run of the program could be:

**Enter day of the year: 64**  
**Day number 64 is Julausept 3.**

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```
cout << "Enter the day of the year: ";
cin >> day;

if (day <= 31)
    cout << "Day number " << day << " is Janfebarch " << day << endl;
else if (day <= 61)
    cout << "Day number " << day << " is Apmajune " << day - 31 << endl;
else if (day <= 91)
    cout << "Day number " << day << " is Julausept " << day - 61 << endl;
else
    cout << "Day number " << day << " is Octnodec " << day - 91 << endl;
```

2. A company needs a program to compute payroll data for its sales people. A person's monthly pay is determined by adding a percentage of their sales + a sales bonus (also based on their sales). Here are the categories on which monthly pay is based:

| <u>category</u> | <u>sales</u>                     | <u>rate</u>          |
|-----------------|----------------------------------|----------------------|
| 1               | \$50,000 or more                 | \$500 + 16% of sales |
| 2               | < \$50,000 but at least \$30,000 | \$400 + 12% of sales |
| 3               | < \$30,000 but at least \$10,000 | \$300 + 9% of sales  |
| 4               | < \$10,000                       | \$200 + 5% of sales  |

Write a program fragment that will:

- declare all variables needed for the following 3 steps
- ask the user for the total sales for the month and get the user's input from the keyboard
- calculate their monthly pay based on sales entered by user
- use only one cout statement at the very end of the program fragment – i.e., no cout allowed in an if/else stmt.

You may assume the following constants have been declared:

```
const int    SALES1 = 50000, SALES2 = 30000, SALES3 = 10000;  
const int    BONUS1 = 500,   BONUS2 = 400,   BONUS3 = 300,   BONUS4 = 200;  
const double PCT1 = 0.16,    PCT2 = 0.12,    PCT3 = 0.09,    PCT4 = 0.05;
```

---

```
double sales, pay;  
  
cout << "Enter the total sales: ";  
cin >> sales;  
  
if (sales >= SALES1)  
    pay = BONUS1 + sales * PCT1;  
else if (sales >= SALES2)  
    pay = BONUS2 + sales * PCT2;  
else if (sales >= SALES3)  
    pay = BONUS3 + sales * PCT3;  
else  
    pay = BONUS4 + sales * PCT4;  
  
cout << "Monthly pay is " << pay << endl;
```



5. Indicate which data type is best to represent the following items:

\_\_\_ **string** \_\_\_                  zip code  
\_\_\_ **char** \_\_\_                    a letter grade on an exam  
\_\_\_ **int** \_\_\_                        age  
\_\_\_ **double** \_\_\_                  the average (numeric) test score for an exam

6. What is the output TO THE SCREEN by the following C++ program fragment?

```
angle = 25;  
side1 = 45;  
  
if (angle = 45)  
    side2 = 45;  
else  
    side2 = 15;  
  
cout<< "angle " << angle << " side 1 " << side1 << " side 2 " << side2 << endl;
```

```
angle 45      side 1 45      side 2 45
```

7. Indicate the UNIX command to do the following:

\_\_\_\_\_ **ls** \_\_\_\_\_                  list files in the current directory  
\_\_\_\_\_ **cd cs150x** \_\_\_\_\_              change the current directory to your class directory (folder)  
\_\_\_\_\_ **mv PA2.CC pa2.cc** \_\_\_\_\_        change a file's name from PA2.CC to pa2.cc  
\_\_\_\_\_ **g++ pa4.cc** \_\_\_\_\_              compile a program named pa4.cc (executable name is your choice)

8. Write a valid C++ assignment statement to express the following math formulas.

a. slope =  $\frac{x_2 - x_1}{y_2 - y_1}$                   **slope = (x2 - x1) / (y2 - y1);**

b. perimeter =  $2L + 2W$                   **perimeter = 2 \* L + 2 \* W;**