

PIC 10A

Review Problems: Ch. 9-10, plus Sec 12.1

These are some review problems for the material covered since the second midterm. For other topics, you should review the two midterms and the practice exams. The final exam will cover all material we've had this semester.

Ch. 9: Arrays and Vectors

1.) Give at least two differences between vectors and arrays. How do you declare each?

Arrays are a built-in data type, while vectors are objects in the <vector> library. Arrays need to be a constant size, while vectors can change size through the pop_back and push_back functions. The declaration for array and vector looks like:

```
int my_array[5];      vector<int> my_vector(5);
```

2.) Write a function that returns a given string in reverse order.

```
cout << reverse("frodo"); //Prints odorf
```

```
string reverse (string word) {  
    string backwards;  
    for (int i = 0; i < word.length(); i++)  
        backwards += word[ word.length( ) -i-1];  
    return backwards;  
}
```

Note: We cannot use backwards[i] or backwards.push_back.

3.) Write a function that deletes the element from a double vector at a given position.

```
deleteElement (v, 3);
```

```
void deleteElement (vector<double> &v, int pos) {  
    for (int i = pos; i < v.size( ) -1; i++)  
        v[i] = v[i+1];  
    v.pop_back( );  
    return;  
}
```

4.) Write a function which prints out the elements of a 2D array.

```

void printTable (double table [table_rows] [table_cols]) {
    for (int i = 0; i < table_rows; i++) {
        for (int j=0; j < table_cols; j++) {
            cout << setw(10) << table [i] [j];

        }
        cout << "\n";
    }
    return;
}

```

Ch. 10: Pointers

5.) What is the output of the following program?

```

void my_fun (int *p, int *&s) {
    s = p;
    *s = 23;
    int x = 5;
    s = &x;
    return;
}

int main ( ) {
    int x = 3;
    int *p = &x;
    int *s;
    my_fun (p, s);
    cout << "x = " << x << " *p=" << *p << " *s=" << *s;
    return 0;
}

```

6.) What is the output of the following program?

```

void my_fun (int *p) {
    *p = 0;
    p++;
    *p = 4;
    p++;
    return;
}

int main ( ) {
    int a[3] = {10,20,30};
}

```

```

    int *p = a;
    cout << *p << "\n";
    my_fun (p);
    cout << a[0] << a[1] << a[2];
    cout << "\n" << *p;
    return 0;
}

```

Ch. 12: File Input / Output

7.) Write a function which reads a file whose name is specified the user, replaces all lower-case vowels (aeiou) with an asterisk *, and then writes the output to the file "out.txt". Display an error message if the file was not found.

```
string fileName;
```

```
cin >> fileName;
```

```
replaceVowels (fileName);
```

```

void replaceVowels (string fileName) {
    ifstream fin;
    ofstream fout;
    string word;
    fin.open( fileName.c_str( ) );
    if (fin.fail( ) )
        cout << "No such file!\n";
    else {
        fout.open("out.txt");
        while (fin << word) {
            for (int i = 0; i < word.length( ); i++)
                if (word[i] == 'a' || word[i] == 'e'
                    || word[i] == 'i' || word[i] == 'o' || word[i] == 'u')
                    word[i] = '*';
            fout << word;
        }
        fout.close( );
        fin.close( );
    }
    return;
}

```