

PS8

Deadline: You have to submit before 17:00

Q1.

Write a template-based class that implements a set of items. The class should allow the user to:

- a. Add a new item to the set
- b. Get the number of items in the set
- c. Get a pointer to a dynamically created array containing each item in the set. The caller of this function is responsible for de-allocating the memory.

Test your class by creating sets of different data types (e.g. integers, strings, etc.)

```
int main()
{
    Set<int> s1;
    Set<string> s2;
    int* intArray = NULL;
    string* stringArray = NULL;
    int i;

    // Add some sample integers to the set
    s1.add(10);
    s1.add(20);
    s1.add(15);
    s1.add(20);
    intArray = s1.getArray();
    cout << "Set_one_has_" << s1.getSize()
         << "items...Here_they_are:" << endl;
    for (i=0; i< s1.getSize(); i++)
    {
        cout << intArray[i] << endl;
    }
    if (intArray!=NULL) delete[] intArray;

    // Add some sample strings to the set
    s2.add("butter");
    s2.add("hamburgers");
    s2.add("pizza");
    s2.add("hotdogs");
    s2.add("pizza");
    stringArray = s2.getArray();
    cout << "Set_two_has_" << s2.getSize()
         << "items...Here_they_are:"
    << endl;
    for (i=0; i< s2.getSize(); i++)
    {
```

```

        cout << stringArray[i] << endl;
    }
    if (stringArray!=NULL) delete [] stringArray;
    return 0;
}

```

Q2.

Write a Pair class so that the pair of items can be different data types. Write a main function that tests the class with pairs of different data types.

```

int main( )
{
    Pair<char, char> p('A', 'B');
    cout << "First_is_" << p.getFirst( ) << endl;
    p.setFirst('Z');
    cout << "First_changed_to_" << p.getFirst( ) << endl;
    cout << "The_pair_is:_" << p.getFirst() << ",_"
        << p.getSecond()
        << endl;

    Pair<int, string> p2(34, "Bill");
    Pair<string, int> p3("Bill", 34);
    cout << "The_pair_is:_" << p2.getFirst() << ",_"
        << p2.getSecond()
        << endl;

    return 0;
}

```

Turn In

- Make and submit a zip file(<your_full_name> _PS8.zip) which includes the following:
 - Source code of Q1: q1.cpp
 - Source code of Q2: q2.cpp
 - Run Q1 and Q2 and attach screenshots(in jpg format, not exceeding 300kb each) which show that your programs run.
 - At least 1 screenshot for each question.