National University of Computer and Emerging Sciences



**Laboratory Manual # 3**

*for*

**Object Oriented Programming**

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**Lab Manual – Classes with Dynamic Data**

A polynomial P1(x) = x4+2x2+5 has three terms: x4, 2x2 and 5. Coefficients of these terms are 1, 2 and 5 respectively while exponents are 4, 2 and 0 respectively. To work with Polynomials, a definition of class Polynomial is given below and memory configuration for P1 is shown as follows:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **class Polynomial**  **{**  **private:**  int totalTerms;//Total terms in a Polynomial  int\* coeff;//to save array of coefficients  int\* exp; //to save array of exponents  **};** | |  |  |  | | --- | --- | --- | | totalTerms | 3 |  | | coeff |  | |  |  |  | | --- | --- | --- | | 1 | 2 | 5 | | | exp |  | |  |  |  | | --- | --- | --- | | 4 | 2 | 0 | | |  | **P1(x)** |  | |

**Your task is to complete the definition of Polynomial class such that the main program runs successfully.** Make sure that your program doesn’t consume extra memory space and it should not leak any memory.

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| **void main()**  **{**  int coeff\_P1[] = {1,2,5}; //Coefficients for Polynomial P1  int exp\_P1[] = {4,2,0}; //Exponents for Polynomial P1  int coeff\_P2[] = {4,3}; //Coefficients for Polynomial P2  int exp\_P2[] = {6,2}; //Exponents for Polynomial P2  Polynomial P1(3, coeff\_P1, exp\_P1);//Creates P1 with 3 terms (P1 = 1x^4 + 2x^2 + 5x^0 )  Polynomial P2(2, coeff\_P2, exp\_P2);//Creates P2 with 2 terms (P2 = 4x^6 + 3x^2)  cout<<"P1 = "; P1.Print(); //Prints P1 = x^4+2x^2+5  cout<<"P2 = "; P2.Print(); //Prints P2 = 4x^6+3x^2  Polynomial P3 = P1.Add(P2); //Adds P1 and P2 and saves result in P3.You may consume extra space for resultant Polynomial in Add function  cout<<"P3 = "; P3.Print(); //Prints P3 = 4x^6+x^4+5x^2+5  P3 = P1;  cout<<"P3 = "; P3.Print();  **}** |