|  |
| --- |
| **Assignment # 3**  ***Session*: Spring 2022 *Total marks*: 100**  ***Name*** : ***\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Roll number* : \_\_\_\_\_\_\_\_\_\_\_\_\_** |

***Submission:***

• *Email instructor or TA if there are any questions. You cannot look at others’ solutions or use others’ solutions, however, you can discuss it with each other. Plagiarism will be dealt with according to the course policy.*

*• Submission after due time will not be accepted.*

**There should be a Report explaining your code and highlighting results. Follow this naming convention for your report RollNumber\_Assignment#.pdf e.g BSCE21001\_Assignment3.pdf.**

**TASKS:**

Write a menu driven program that takes characters from the user and store these characters in an array, it keeps asking characters until user presses $.

Create a struct **GrowableArray** having two members ( character dynamic array, size of array).

You must dynamically increase the size of the array when needed. New array should contain the previously added elements as well as the new element to be added. The criteria for increasing the size of array is that new array should be double the original size.

Take initial size of array as 1.

For the first character, the size should be 1. For second character size should be 2. For third character size should be 4 and so on.

You should implement following 3 functions:

* **bool getInput(GrowableArray )**

**//** This function will take inputs from the user and return “False” for all the inputs other than '$'. It returns “True” for the “$”. It stores input at the next available index of array.

* **int resizeArray(GrowableArray )**

**//** Other than the details given above, this function will resize the array for every input and return the current size of the array.

* **void printArray(GrowableArray )**

**//** This function will display all inputs given by the user except “$"

**Marks division:**

* Menu [5 marks]
* bool getInput(GrowableArray ) [15 marks]
* int resizeArray(GrowableArray ) [50 marks]
* void printArray(GrowableArray ) [10 marks]
* Report (containing code, comments, and output) [20 marks]

|  |
| --- |
| bool getInput(growableArray s, char &ch1,int &i){  s.size=1;  s.ch=new char [s.size];  if (ch1 != '$') {  s.ch[i] = ch1;  return false;  } else {  return true;  } } int resizeArray(growableArray s, char &ch1, int &i){  char \*ch;  ch= new char [s.size];  s.size =2\*s.size;  char \*ch2 = new char [s.size];  if(ch1!='$'){  s.ch[i]=ch1;  ch2[s.size]=s.ch[i];  cout<<"size = "<<s.size<<endl;   }  s.ch=ch2;  delete []ch2;  return s.size;  } void printArray(growableArray s, char &ch1,int &i){  s.size=1;  s.ch=new char [s.size];  if (ch1 != '$') {  s.ch[i] = ch1;  cout<<"array ="<<s.ch[i]<<endl;  } }  **Main.cpp:**  int main() {  growableArray s;  int opt; do{  cout<<"WHICH TASK DO YOU WANT TO PERFORM "<<endl;  cout<<"1.task 1"<<endl;  cout<<"2.task 2"<<endl;  cout<<"3.task 3"<<endl;  cout<<"4.exit"<<endl;  cin>>opt;  if(opt==1){  cout<<"====================================== task 1============================"<<endl;  int size = 1;  char \*ch;  char ch1;  int i = 0;  do {  cout << "enter character ";  cin >> ch1;  getInput(s, ch1, i);  } while (ch1 != '$');  i++;  }  if(opt==2){  cout<<" ==================================== task 2 ==========================="<<endl;  char ch1;  int j = 0;  s.size=1;  int i;  do {  cout << "enter character ";  cin >> ch1;  if(j==s.size){  s.size=resizeArray(s,ch1, i);  }  j++;  }  while (ch1 != '$');  }  if(opt==3){  cout<<"===================================== task 3 =========================="<<endl;  int size = 1;  char \*ch;  char ch1;  int i = 0;  do {  cout << "enter character ";  cin >> ch1;  printArray( s, ch1,i);  }  while (ch1 != '$');  i++;  }  if(opt==4){  cout<<"YOU CHOOSE TO EXIT"<<endl;  exit(1);  }  else{  cout<<"YOU HAVE ENTERED INVALID INPUT"<<endl;  } } while(opt>=1 && opt<=4); } |