CS261: Exam 1

1 Problem 1: Sort Bag in the Ascending Order – 70 points

Complete the C function for sorting in the ascending order elements of Bag implemented as a dynamic array. An input argument of the function is the pointer to Bag.

2 Problem 2: Initialize Dynamic Array – 30 points

Complete the C function for initializing a dynamic array. Input arguments of the function include the pointer to the dynamic array, and capacity of the memory block to initially allocate to the dynamic array.

```
void _swap(TYPE *a, TYPE *b); /*auxiliary internal function*/

/*-----------------------------------------------*/
void sortAscendBag(struct DynArr *bag){
   int i,j;

/*5 point; check input arguments*/
   assert(bag);

/*20 points; two loops for any sorting algorithm*/
   for(i=0;i<bag->size-1;i++){
      for(j=i+1;j<bag->size;j++){

/*20 points; check the ascending order*/
         if(LT(bag->data[j], bag->data[i])) /*no need to use LT()*/

/*25 points; swap when the ascending order violated*/
            _swap(bag->data+i, bag->data+j);
   }  }
}

void _swap(TYPE *a, TYPE *b){
   TYPE tmp;
   assert(a && b);
   tmp = *a;
   *a = *b;
   *b = tmp;
}
```

```
/* Initialize Deque */
void initDeque(struct Deque * dq, int cap) {

/*5 points; check input arguments*/
   assert (dq && cap > 0);

/*10 points; initialize capacity, size, front index*/
   dq->capacity = cap;
   dq->size = dq->front = 0;

/*10 points; allocate a block of memory*/
   dq->data = (TYPE *) malloc(dq->capacity * sizeof(TYPE));

/*5 points; check if malloc was successful*/
   assert (dq->data != 0);
}
```