

SE 322 Midterm #2

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I. QUESTION (15 POINTS)

Write the method

```
int* double_list(int* array, int N)
```

which doubles each number in an integer array of size N , that is, after each element inserts that element again. The result should be a new array of size $2N$.

II. QUESTION (20 POINTS)

Write the method

```
int** dynamic_array(int rows,
                    int* columns)
```

which allocates, fills and returns a two dimensional array, where row i has $columns[i]$ columns. Write also

```
void free_dynamic_array(int** array,
                        int rows)
```

which deallocates memory allocated for that array.

III. QUESTION (15 POINTS)

Declare struct **club** which contains name (String), player_count (integer), player_names (constant String array of size 11), point (integer). Write also method

```
Clubptr new_club(char* name)
```

which creates and returns a new club pointer from the given parameters. player_count and point should be initialized to 0.

IV. QUESTION (10 POINTS)

Write the method

```
void play_match(Clubptr club1, Clubptr club2)
```

that simulates a match played between club1 and club2. The number of goals scored by the club1 and club2 are taken from the user. If club1 wins the match, club1's point is increased by 3, else if club2 wins the match, club2's point is increased by 3, else (in case of a tie) both club1 and club2's points are increased by 1.

V. QUESTION (20 POINTS)

Write methods

```
void add_player(Clubptr club, char* name)
void remove_player(Clubptr club, char* name)
```

which adds/removes player to/from the club with the given player name.

VI. QUESTION (20 POINTS)

Write the method

```
int* create_from_counts(int* counts,
                       int* values, int N)
```

which creates an array and fill the elements as follows. First there are $counts[0]$ elements which have the value of $items[0]$, then there are $counts[1]$ elements which have the values of $items[1]$, ..., and in the end there are $counts[N - 1]$ elements which have the values of $items[N - 1]$. For example if the counts array contains elements 2, 3, 1 and the values array contains elements 10, 25, 15 then the resulting array will have the elements 10, 10, 25, 25, 25, 15 in that order.