



## Regras:

1. Se este template não for submetido e preenchido corretamente, será atribuída a cotação zero ao laboratório;
2. Não se esqueça de submeter a pasta com o projeto do laboratório (código-fonte + makefile); sem código é atribuído zero ao laboratório.
3. Não "falsifique" os outputs dos níveis; alguma situação dessas resultará na atribuição de zero a dois laboratórios consecutivos.

## Identificação Alunos

- 190221093 | Alexandre Coelho
- 190221128 | Sérgio Veríssimo

## Nível 1 – Código de teste + output

## Nível 2 – Código de teste + output

```
char* name = "Alexandre Veríssimo";
int number = 190221093;
Student newStudent = studentCreate(number, name);
Grade newGrade = gradeCreate(number, name, 20);

Grade gradeVector[10];
char* names[10] = {"Hugo Vieira", "Maria Carvalho", "Joaquim Dinis", "Henrique Ferreira",
"Margarida Mourato", "Diogo Carreira", "Ana Marques", "Manuel Quintino", "Joana Firmino",
"Lara Pires"};
const int studentNumbers[10] =
{145678478, 193498649, 190530864, 156978458, 146978478, 185678478,
175678458, 135674468, 145678479, 165678478};
const float results[10] = {
10.40, 16.35, 09.50, 17.40, 06.45, 12.80, 14.60, 07.20, 16.40, 19.30};

for(int i=0; i<10; i++){
    gradeVector[i] = gradeCreate(studentNumbers[i], names[i], results[i]);
}
```

```
gradePrint(newGrade);
gradeArrayPrint(gradeVector,10);
```

**Output:**

Number: 190221093 | Name: Alexandre Veríssimo | Grade: 20.00 | Status: Approved

All class notes:

Number: 145678478 | Name: Hugo Vieira | Grade: 10.40 | Status: Approved  
 Number: 193498649 | Name: Maria Carvalho | Grade: 16.35 | Status: Approved  
 Number: 190530864 | Name: Joaquim Dinis | Grade: 9.50 | Status: Approved  
 Number: 156978458 | Name: Henrique Ferreira | Grade: 17.40 | Status: Approved  
 Number: 146978478 | Name: Margarida Mourato | Grade: 6.45 | Status: Reproved  
 Number: 185678478 | Name: Diogo Carreira | Grade: 12.80 | Status: Approved  
 Number: 175678458 | Name: Ana Marques | Grade: 14.60 | Status: Approved  
 Number: 135674468 | Name: Manuel Quintino | Grade: 7.20 | Status: Reproved  
 Number: 145678479 | Name: Joana Firmino | Grade: 16.40 | Status: Approved  
 Number: 165678478 | Name: Lara Pires | Grade: 19.30 | Status: Approved

**Nível 3 – Código de teste + output**

---

```
int approved = getNumberApproved(gradeVector,10);
printf("\nTotal of Approved: %d in 10\n", approved);
```

```
float value = 9.50;
bool checkIfExists = resultExists(gradeVector,10,value);
printf("Someone got %.2f values? %s\n\n", value, checkIfExists ? "Yes" : "No");
```

**Output:**

Total of Approved: 8 in 10  
 Someone got 9.50 values? Yes

**Nível 4 – Código de teste + output**

---

```
int majorGrade = getMajorGrade(gradeVector,10);
printf("The best grade is %.2f values from %s\n", results[majorGrade], names[majorGrade]);
```

```
int minorGrade = getMinorGrade(gradeVector,10);
printf("The worst grade is %.2f values from %s\n", results[minorGrade], names[minorGrade]);
```

```
gradeArrayStats(gradeVector,10);
```

**Output:**

The best grade is 19.30 values from Lara Pires  
 The worst grade is 6.45 values from Margarida Mourato

All class notes:

Number: 145678478 | Name: Hugo Vieira | Grade: 10.40 | Status: Approved  
 Number: 193498649 | Name: Maria Carvalho | Grade: 16.35 | Status: Approved

Number: 190530864 | Name: Joaquim Dinis | Grade: 9.50 | Status: Approved  
 Number: 156978458 | Name: Henrique Ferreira | Grade: 17.40 | Status: Approved  
 Number: 146978478 | Name: Margarida Mourato | Grade: 6.45 | Status: Reproved  
 Number: 185678478 | Name: Diogo Carreira | Grade: 12.80 | Status: Approved  
 Number: 175678458 | Name: Ana Marques | Grade: 14.60 | Status: Approved  
 Number: 135674468 | Name: Manuel Quintino | Grade: 7.20 | Status: Reproved  
 Number: 145678479 | Name: Joana Firmino | Grade: 16.40 | Status: Approved  
 Number: 165678478 | Name: Lara Pires | Grade: 19.30 | Status: Approved  
 Total of Approved: 8 in 10  
 The best great is 19.30 values from Lara Pires  
 The worst great is 6.45 values from Margarida Mourato

## Nível 5 – Código de teste + output

---

```
printf("\nSort all grades by results:\n");
gradeArrSortByResult(gradeVector,10);
```

```
printf("\nSort all grades by student number:\n");
gradeArrSortByNumber(gradeVector,10);
```

### Output:

Sort all grades by results:

All class notes:

Number: 146978478 | Name: Margarida Mourato | Grade: 6.45 | Status: Reproved  
 Number: 135674468 | Name: Manuel Quintino | Grade: 7.20 | Status: Reproved  
 Number: 190530864 | Name: Joaquim Dinis | Grade: 9.50 | Status: Approved  
 Number: 145678478 | Name: Hugo Vieira | Grade: 10.40 | Status: Approved  
 Number: 185678478 | Name: Diogo Carreira | Grade: 12.80 | Status: Approved  
 Number: 175678458 | Name: Ana Marques | Grade: 14.60 | Status: Approved  
 Number: 193498649 | Name: Maria Carvalho | Grade: 16.35 | Status: Approved  
 Number: 145678479 | Name: Joana Firmino | Grade: 16.40 | Status: Approved  
 Number: 156978458 | Name: Henrique Ferreira | Grade: 17.40 | Status: Approved  
 Number: 165678478 | Name: Lara Pires | Grade: 19.30 | Status: Approved

Sort all grades by student number:

All class notes:

Number: 135674468 | Name: Manuel Quintino | Grade: 7.20 | Status: Reproved  
 Number: 145678478 | Name: Hugo Vieira | Grade: 10.40 | Status: Approved  
 Number: 145678479 | Name: Joana Firmino | Grade: 16.40 | Status: Approved  
 Number: 146978478 | Name: Margarida Mourato | Grade: 6.45 | Status: Reproved  
 Number: 156978458 | Name: Henrique Ferreira | Grade: 17.40 | Status: Approved  
 Number: 165678478 | Name: Lara Pires | Grade: 19.30 | Status: Approved  
 Number: 175678458 | Name: Ana Marques | Grade: 14.60 | Status: Approved  
 Number: 185678478 | Name: Diogo Carreira | Grade: 12.80 | Status: Approved  
 Number: 190530864 | Name: Joaquim Dinis | Grade: 9.50 | Status: Approved  
 Number: 193498649 | Name: Maria Carvalho | Grade: 16.35 | Status: Approved

