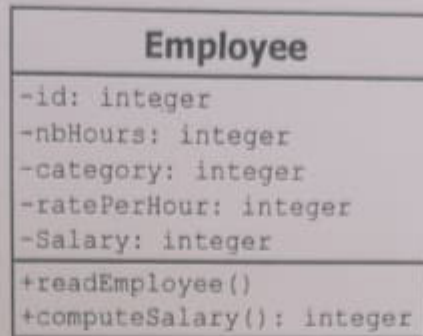


Question 2 (6 marks)

We define an Employee as shown in the following UML class diagram.



We want to implement the Employee struct with the following constraints:

- The employee belong ONLY to category 1 or 2.
- ratePerHour is 250 for category 1 and 300 for category 2.
- nbHours that an employee should work per month is either 30 or 32.

1. Write the Employee structure.
2. Write the procedure readEmployee that reads the four first fields of an employee,
3. Write the function computeSalary that computes the salary of an employee. Note that the function computeSalary should be called inside the procedure readEmployee. readEmployee accepts only valid data.

Answer:

```

// Def struct Employee
struct Employee {
    int id;
    int nbhours;
    int category;
    int ratePerhour;
    int nbHours;
    int salary;
};

int computeSalary (Employee e) {
    int sal = e.nbhours * e.ratePerhour;
    return sal;
}
    
```

Question 3 (4 marks)

- Write a procedure findMinMax that gives the location of the min value and the max value in an array of integer. The array has MAXSIZE cells and only nb cells were filled.

Answer:

```
void findMinMax (int arr[], int nb, int *max, int *min) {
    int tempMax = arr[0];
    int tempMin = arr[0]; int i = 0; *max = 0; *min = 0;
    for (i = 0; i < nb; i++) {
        if (arr[i] > tempMax) {
            tempMax = arr[i];
            *max = i;
        }
        if (arr[i] < tempMin) {
            tempMin = arr[i];
            *min = i;
        }
    }
}
```

# Question 1 (5 marks)

What is the output of the following code :

$sum = 4$   
 $i = 2, j = 2$   
 $sum = 3$   
 $i = 3, j = 3$   
 $sum = 6$

code	Output result
<pre> #include &lt;stdio.h&gt; int fun(int n) {     int i, j, sum = 0;     for(i = 1; i &lt;= n; i++)         for(j = i; j &lt;= i; j++)             sum = sum + j;     return(sum); }  int main() {     printf("%d", fun(4));     return 0; } </pre> <p> <math>j = 4</math>  <math>j = 3, j = 2, j = 1</math>  <math>sum = 1</math>  <math>= 3</math>  <math>= 6</math>  <math>= 10</math> </p>	<p>10</p> <p>2</p>
<pre> #include &lt;stdio.h&gt;  int main() {     int a = 50, b = 60, c;     c = a /* Will this comment work? */ + b;     printf("%d /* And this? */ \n", third);     return 0; } </pre>	<p>110</p> <p>1</p>
<pre> int main() {     int a[10];     printf("%d", *a+1-*a+3);     return 0; } </pre>	<p> <math>(a[0]+1) - a[0] + 3</math>              value of <math>a[0]+1 - a[0] + 3</math> </p>

**Question 1:** (10 marks) What is the output of this C snippet code

Code	Answer (2 Marks each a
<pre> 1. void main() { 2.     int x = 0, y = 0, z = 1; 3.     int a = ++x &amp;&amp; (y    z--); 4.     printf("%d", a); 5. }</pre>	0
<pre> 1. void main() { 2.     int x = 5, z ; 3.     printf(" %d\n", sizeof(++x+z)); 4.     printf(" %d\n", x); 5. }</pre>	8
<pre> 1. int main() { 2.     int x; 3.     float y; 4.     y = x = 7.5; 5.     printf("x=%d y=%f", x, y); 6. }</pre>	4 =
<pre> 1. void main() { 2.     int k = 8; 3.     int m = 7; 4.     int z = --k &lt; m ? --k : ++m; 5.     printf("%d", z); 6. }</pre>	7
<pre> 1. int compute(char *s){ 2.     int i = 0; 3.     while(*s != '\0') 4.         {++i; s++;} 5.     return (i); 6. } 7. int main() { 8.     char d[] = "KSUniversity"; 9.     printf("res = %d\n", compute(d)); 10.    return 0; 11. }</pre>	res = 12

**Question 2:** (6 marks) A book is defined by its title, author, publisher and ISBN which is its number.

- Write the data structures needed to define a stack of books. (3 Marks)
- Write only the signatures of its related pop, push and peek methods. (3 Marks)