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**Study for the numerical resolution of conservation equations  
of mass, momentum and energy to be applied to the  
aerodynamics of airfoil-shaped bodies**

**- STUDY'S BUDGET -**

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**Escola Tècnica Superior d'Enginyeries Industrial i Aeronàutica de Terrassa  
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## Study's Budget

Regarding the budget estimation of this study four main aspects have to be taken into account:

- Human resources: this paper has been elaborated by a non-graduated aerospace engineering student (currently at last year of an Undergraduate Degree). The hourly payment that a student in such career stage would receive is difficult to estimate, for the majority of the employed ones are enrolled in internships or apprenticeships and the salaries are very variable. Therefore, it has been considered the current minimum wage in Spain[21], in order to set an inferior limit. The total amount of hours devoted to the study is 300, distributed along 114 days (3.68 months).
- Software: this includes all the programmes and software licenses that have been used during the study. Its costs are proportional to the time-extension of the study with respect to the life expectancy of the computer, as it is assumed each time the computer is replaced, the newest licenses are bought.
- Hardware resources: it refers to the computer that was used. Following the requirements, the generated codes had to be suitable for its execution on a standard computer (avoiding the use of supercomputers, clusters, etc.). Thus, this aspect would include the laptop with which the programmes have been developed. For the cost computation, laptop's life expectancy will be assumed to be 5 years while its acquisition cost was 1,200.00 €. Therefore, the proportional part corresponding to its usage in the study with respect to its total life expectancy will be due.
- Energy resources: it basically takes into account the electricity consumed by the computer along the study. The average power consumption of the computer and the hours in which the computer has been active are to be taken into account.

The budget is presented in the table below:

Concept	Item	Unit price	Unities	Total
Human resources	Payment	648.60 €/month	3.68 (114 days)	2,386.85 €
				<b>2,386.85 €</b>
Software	Microsoft Office License	1.15 €/month	3.68	4.23 €
	Dev-C++	0.00 €/month	3.68	0.00 €
	Matlab Education License	8.33 €/month	3.68	30.65 €
				<b>34.88 €</b>
Hardware	Laptop Acer Aspire 5830TG	20.00 €/month	3.68	73.60 €
				<b>73.60 €</b>
Energy resources	Electricity	0.22 €/kWh	40W·300h	2.64 €
				<b>2.64 €</b>
				<b>2,497.97 €</b>

