UNIVERSIDAD NACIONAL Facultad de Ciencias Exactas y Naturales Escuela de Informática EIF207 – Estructuras de Datos

EIF207 Estructuras de Datos Práctica #1

Prof. M.Sc. Georges E. Alfaro S.

PARTE ÚNICA.

Ejercicio #1

Descripción.

Escriba un programa de consola en C++ que lea los datos de un conjunto de empleados del archivo de texto adjunto ('salarios.txt'). El archivo contiene la información de salario de varios empleados, incluyendo:

- Número de identificación del empleado
- Primer apellido
- Segundo apellido
- Nombre
- Fecha de nacimiento
- Salario bruto

Los registros de cada empleado vienen en líneas aparte, y cada campo o atributo está separado por un carácter de tabulación ('\t'). La codificación del archivo es UNICODE (UTF-8).

Debe leer los datos del archivo y mostrar un reporte en la consola como el que se muestra más abajo. El nombre del archivo puede especificarse directamente dentro del código o enviarse como parámetro.

En el archivo se incluye el salario bruto de cada empleado. Se calculará el monto de las deducciones aplicables y se mostrará junto con el salario neto correspondiente. Las deducciones son un 9% del salario bruto. Si el salario bruto del empleado es mayor a 950,000.00, se deducirá un monto adicional correspondiente al 5% sobre el exceso de 950,000.00.

Por ejemplo, para un salario de 875,000, las deducciones son:

$$875,000.00 \times 9\% = 78,750.00$$

Para un salario de 1,300,000, las deducciones son:

$$1,300,000 \times 9\% + (1,300,000 - 950,000) \times 5\%$$

 $117,000 + 350,000 \times 5\% = 117,000 + 17,500 = 134,500$

Al final del reporte, se mostrarán 3 filas de subtotales, para el salario bruto, las deducciones y el salario neto. Cada fila contendrá los valores mínimos, promedio y máximos para cada columna, respectivamente.

Si el salario neto de un empleado es menor o igual al promedio (de salarios netos), se indicará esta condición colocando un asterisco ('*') al final de la fila correspondiente.

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El reporte de salario debe tener un formato adecuado, usando un ancho uniforme para cada columna, dos posiciones decimales para cada valor numérico y los separadores para la posición de los millares y millones.

Los datos de los empleados se mostrarán ordenados alfabéticamente por apellido. Si el primer apellido de dos empleados es el mismo, se considerará también el segundo apellido.

Id	Apellidos	Monbre	Sal, bruto	Deducciones	Sal. neto	! .
859357380	Agüero Vargas	Abigail	1 800,000.00	72,000.00	725,000.00	1
961705352	Aguilar Campos	Juan	2,350,000.00	281,500.00	2,068,588.88	1
97508546	Aguilar Munoz	Alvero	2,425,000.00	292,000,00	2,133,000.00	ű.
22996070	Alfaro López	Tamya	1,350,000.00	141,580.88	1,208,500.00	1
38618383	Aloizar Valverde	Esteban	2,425,000.00	292,000.00	2,133,000.00	1
379976368	Alvarez Alfaro	Adriana	075,000.00	78,750.00	796,250.00	1.
853544120	Alvarez Araya	Daniel	2,350,000.00 1	281,300.00	2,068,500.00	1
						4
153874883	Alvarez Mora	Peblo	1,525,000.00	166,000.00	1,359,000.00	t:
33878020	Alvarez Rodriguez	Victor	1,375,000.00	145,000.00	1,230,000.00	1
815907966	Awador Fuentes	Roberto	1,825,000.00	208,000.00	1,617,000.00	1
821813113	Araya Madrigal	Tanya	1,275,000.00	131,000.00	1,144,000.00	1 4
126667169	Arce Campos	1 Ariene	2,400,000.00 1	288,500.00	2,111,500.00	1
397767739	Arce González	Gilberto	1,300,000.00	134,500.00	1,165,500.80	1
553026467	Arce Hidalgo	Maria	1,675,000.00	187,000:00	1,488,000.00	1
298039286	Arce Villalobos	Sebastián	2,075,000.00	243,000.00	1,832,000.80	1
616966080	Arguedas Rivas	Carolina	1,525,000.00	166,000.00	1,359,000.00	1
556179636	Arias Venegas	Pamela	1,300,000.00	134,500.00	1,165,500.00	1 1
848339438	Aries Viguez	Camila	1 1,375,000.00 1	145,000.00	1,230,000.00	1 1
652979016	Avilés Vincenzi	Carolina	1 2,475,000.08 1	299,000.00	2,176,888.88	1
628543619	Barahona López	1 Zuan	2,475,000.00	299,000.00	2,176,000.00	i.
978859614	Barahona Rodriguez	Débora	2,475,888.88	299,000.00	2,176,000.80	i -
982965795	Harboza Cascante	Sebastian	2,250,000.00]	267,500.00	1,982,500.00	i .
184369747	Barboza Rodriguez	1	1,475,000,00	239,000,00	115,000,00	
	Harrison Annual Control		212001111111111111111111111111111111111	100000000000000000000000000000000000000	77.00	
				700.000		
332201045	Notes Furnandez	I Juan Cartos	1 2,125,000,00	250,000,00	1,875,000,00	1
332361645	Rajas Fernández	1 Juan Cartos	1 2,125,000.00 1	250,000.00	1,875,000.00	-
332361645 267281889	Rojas Firmandez Rojas Númez	Juan Carlos Cristina	2,125,066.00 2,100,000.00	250,000.00	1,875,000.00 2,025,500.00	1
332361645 267281889 865897166	Rojas Firmandez Rojas Núnez Rulz Navarro	Juan Carlos Cristina Carlos	2,125,066.00 1 2,300,000.00 1 2,300,000.00	250,000.00 274,500.00 274,500.00	1,873,000.00 2,025,500.00 2,025,500.00	
332361845 267281889 865897166 913535357	Rojes Fernandez Rojes Nühez Ruiz Navarro Säenz Montero	Juan Cortos Cristina Carlos Maria	1 2,125,088.00 1 2,300,000.00 1 2,300,000.00 1 1,725,000.00 1	250,000.00 274,500.00 274,500.00 194,000.00	1,875,000.00 2,025,500.00 2,025,500.00 1,531,000.00	1
332361845 267281889 865897166 913535357 542423065	Rojas Fernandez Rojas Núnez Ruiz Navarro Sãenz Montero Salas Bermúdez	Juan Carlos Cristina Carlos Maria Cermen Maria	1 2,125,006.00 1 2,300,000.00 1 2,300,000.00 1 1 1,725,000.00 1 2,275,000.00 1	250,000.00 274,500.00 274,500.00 194,000.00 271,000.00	1,875,000.00 2,025,500.00 2,025,500.00 1,531,000.00 2,004,000.00	
332761045 267281889 865897166 913535357 542423065 167385405	Rojas Fernandez Rojas Núnez Ruiz Navarro Sáenz Montero Salas Bermüdez Salas Chaves	Juan Cortos Cristina Carlos Maria Carmen Maria José	2,125,006.00 2,300,008.00 1 2,300,008.00 1 1,725,000.00 1 2,275,000.00 1 2,075,000.00	250,000,00 274,500.00 274,500.00 194,000.00 271,000.00 243,000.00	1,875,000.00 2,025,500.00 2,025,500.00 1,531,000.00 2,004,000.00 1,832,000.00	
337361845 267281889 865897166 913535357 542423065 167385405 582526637	Rojes Fernandez Rojes Ninez Rojes Ninez Ruiz Navarro Sales Montero Sales Chaves Salezer More	Juan Cortos Cristina Cartos Maria Carmen Maria José Juan	2,225,088.00 2,300,000.00 2,300,000.00 1,725,000.00 1,725,000.00 1,725,000.00 1,550,000.00	250,000.00 274,500.00 274,500.00 194,000.00 271,000.00 243,000.00 169,500.00	1,875,000.00 2,025,500.00 2,025,500.00 1,531,000.00 2,004,000.00 1,832,000.00 1,380,500.00	
331701045 267201089 865897166 913535357 542423065 167385405 582526637 238298422	Rojes Fernandez Rojes Nunez Ruiz Navarro Sales Montero Sales Bermüdez Sales Chaves Salazer Mora Sanchez Cerdas	Juan Carlos Cristina Carlos María Carmen Maria José Juan Marielos	2,225,088.00 2,300,080.00 1,725,080.00 1,725,080.00 2,275,080.00 1,550,080.88 2,325,080.00 2,325,080.00	250,000.00 274,500.00 274,500.00 194,000.00 271,000.00 243,000.00 169,500.00 278,000.00	1,875,000.00 2,025,500.00 2,025,500.00 1,531,000.00 2,004,000.00 1,832,000.00 1,830,500.00 2,047,000.00	
331701045 267201089 865897166 913535357 542423065 167385405 582526637 238298422 824273178	Rojas Fernández Rojas Nunez Ruiz Navarro Sáenz Montero Sáenz Montero Salas Chaves Salas Chaves Salazar Mora Sánchez Cordas Sánchez Zúniga	Juan Cartos Cristina Carlos Maria Carmen Maria José Juan Marielos Edgar	1 2,300,000,00 2,300,000,00 1,725,000,00 1,725,000,00 2,975,000,00 1,550,000,00 2,325,000,00 2,325,000,00 2,100,000,00	250,000.00 274,500.00 274,500.00 194,000.00 271,000.00 243,000.00 169,500.00 278,000.00 246,900.00	1,875,000.00 2,025,500.00 2,025,500.00 1,531,000.00 2,004,000.00 1,832,000.00 1,832,000.00 2,047,000.00 1,653,500.00	
932701045 267201089 965897166 913535357 542423065 167385405 582526637 238298422 824273178 931447906	Rojas Firmandez Rojas Nunez Ruiz Navarro Jáenz Montero Salas Enmudez Salos Cheves Salozer Mora Sánchez Zúniga Jáenchez Zúniga Jáegure Materrita	Juan Cortos Cristina Carlos María Carmen María José Juan Marielos Edgar Valeria	2,25,000.00 2,300,000.00 1,725,000.00 1,725,000.00 2,775,000.00 1,775,000.00 1,550,000.00 2,275,000.00 2,100,000.00 1,150,000.00	250,090.00 274,500.00 274,500.00 194,000.00 271,000.00 233,000.00 169,500.00 278,000.00 246,500.00 197,500.00	1,873,000.00 2,025,500.00 2,025,500.00 1,531,000.00 1,532,000.00 1,380,500.00 2,047,000.00 1,553,500.00 1,553,500.00	
267201089 267201089 265897166 913535357 542423065 167385405 267385405 238298422 224273378 931447906 741549800	Rojas Fernandez Rojas Nunez Ruiz Navarro Sâenz Montero Sales Enmúdez Salas Chaves Salazar Mora Sânchez Cerdas Sânchez Cerdas Sanchez Zúniga Segura Matarrita Segura Matarrita	Juan Cartos Cristina Carlos María Carmen Meria José Juan Marielos Edgar Valeria Andrés	2,25,096.00 2,300,000.00 1,300,000.00 1,725,000.00 1,725,000.00 1,550,000.00 1,550,000.00 2,325,000.00 1,700,000.00 1,700,000.00 1,700,000.00	250,000.00 274,500.00 274,500.00 194,000.00 271,000.00 243,000.00 169,500.00 278,000.00 246,500.00 197,500.00 197,500.00	1,873,000.00 2,025,500.00 1,531,000.00 7,004,000.00 1,332,000.00 1,330,500.00 2,047,000.00 1,553,500.00 1,552,500.00	
267201889 267201889 265897166 9135355357 542423065 567385405 582526637 238298422 8224273178 931447906 441549000 431857046	Rojas Fernandez Rojas Nunez Rojas Nunez Ruiz Navarro Salez Montero Salez Mortero Sales Dermidez Sales Chaves Salezar More Sanchez Cordas Sánchez Zúniga Segure Materrite Segure Rojas Solano Barrentes	Juan Cartos Cristina Carlos Maria Carmen Maria José Juan Marielos Edgar Valeria Andrés Luis Guillermo	2,15,006.00 2,300,000.00 1,725,000.00 1,775,000.00 2,775,000.00 1,775,000.00 1,550,000.00 2,325,000.00 2,100,000.00 1,790,000.00 1,500,000.00 1,790,000.00 1,790,000.00	250,000.00 274,500.00 194,000.00 271,000.00 271,000.00 243,000.00 169,500.00 278,000.00 197,500.00 197,500.00 102,500.00	1,875,000,00 2,025,500,00 2,025,500,00 1,531,000,00 1,832,000,00 1,332,000,00 1,347,000,00 1,853,500,00 1,853,500,00 1,975,000,00 972,000,00	
237701043 267281089 865897166 913535157 562727065 562727065 582526637 238298422 824273178 931447906 431857046 333184829	Rojas Firmandez Rojas Ninez Ruiz Navarro Salenz Montero Sales Enrudez Salas Chaves Salazer Mora Sanchez Zoniga Sanchez Zoniga Sagura Materrita Segura Rojas Solano Barrentes Solano Foneca	Juan Cortos Cristina Carlos María José Juan Marialos Edgar Valeria Andrés Luis Guillermo Manuel	2,25,096.00 2,300,000.00 1,300,000.00 1,725,000.00 1,725,000.00 1,275,000.00 2,275,000.00 2,325,000.00 1,550,000.00 1,750,000.00 1,750,000.00 1,750,000.00 1,750,000.00 1,750,000.00 1,750,000.00 1,750,000.00 1,750,000.00	250,000,00 274,500.00 274,500.00 194,000.00 271,000.00 243,000.00 269,500.00 278,000.00 246,500.00 197,500.00 197,500.00 197,500.00 102,500.00 103,000.00 103,000.00	1,875,000.00 2,025,500.00 1,035,500.00 1,531,000.00 1,832,000.00 1,832,000.00 2,047,000.00 1,853,500.00 2,197,500.00 972,000.00 2,025,500.00	
23276.043 267291889 865897166 865897166 167385485 167385485 882526637 238298422 8324273378 931447906 741549888 431857046 3333184829 961566298	Rojas Fernandez Rojas Nunez Rojas Nunez Ruiz Navarro 18enz Montero 18elas Bermúdez Salas Chaves Salazar Mora Sánchez Cerdas 18ánchez Zúñiga Sagura Matarrita 18egura Rojas 18olano Berrantes Solano Fonseca 30lano Ramirez	Juan Cartos Cristina Carlos María Carmen María José Juan Marielos Edgar Valeria Andrés Luis Guillermo Manuel Luis Roberto	2,25,096.00 2,300,000.00 1,725,000.00 1,725,000.00 1,725,000.00 1,725,000.00 1,550,000.00 1,550,000.00 1,750,000.00 1,750,000.00 1,750,000.00 1,975,000.00 1,975,000.00 1,975,000.00 1,975,000.00	250,000.00 274,500.00 194,000.00 194,000.00 241,900.00 160,500.00 177,500.00 177,500.00 197,500.00 197,500.00 197,500.00 197,500.00 197,500.00 197,500.00	1,675,000.00 2,025,500.00 1,025,500.00 1,331,000.00 1,331,000.00 1,360,500.00 2,047,900.00 1,853,500.00 1,552,500.00 972,000.00 2,025,500.00 1,617,000.00	
232761649 267281689 865897166 913535157 542423065 167385405 562526637 238298422 824273178 931447900 431857046 333184629 5527671967	Rojas Firmandez Rojas Nunez Ruiz Navarro Jánz Montero Salas Bermidez Salas Chaves Salazar Mora Jánchez Cordas Jánchez Zúniga Segura Materrita Segura Rojas Solano Barrantes Solano Ramirez Joto Quesada	Juan Cortos Cristina Carlos María Carmen María José Juan Marielos Edgar Valeria Andrés Luis Guillermo Manuel Luis Roberta Pedro	2,30,000.00 2,300,000.00 1,725,000.00 1,725,000.00 1,725,000.00 1,750,000.00 1,550,000.00 2,325,000.00 1,750,000.00 1,750,000.00 1,750,000.00 1,250,000.00 1,250,000.00 1,250,000.00 1,250,000.00 1,250,000.00 1,250,000.00 1,250,000.00 1,250,000.00 1,250,000.00	250,000,00 274,500.00 274,500.00 134,000.00 271,900.00 243,900.00 269,500.00 278,000.00 278,000.00 278,000.00 278,000.00 278,000.00 274,500.00 274,500.00 274,500.00 274,500.00	1,675,000.00 2,025,500.00 2,025,500.00 1,331,000.00 1,330,500.00 1,330,500.00 2,047,000.00 1,552,500.00 2,197,500.00 2,025,500.00 1,617,600.00 1,617,600.00 1,617,600.00	
032701049 067201890 065897166 0913535157 542423065 167385405 582526637 7338298422 824273178 931447908 741549808 931857046 933184829 961566290 977871907	Rojas Firmandez Rojas Ninez Rojas Ninez Ruiz Navarro Săenz Montero Isales Bermidez Isales Chaves Salazar Mora Sanchez Cordas Sanchez Züniga Segure Materrita Segure Rojas Solano Berrentes Solano Berrentes Solano Ramirez Sota Quesada Taylor Valverde	Juan Cartos Cristina Carlos María José Juan Marialos Edgar Valeria Andrés Luis Guillerno Manuel Luis Roberto Pedro Jesos	2,25,096.00 2,300,000.00 1,725,000.00 1,725,000.00 1,725,000.00 1,550,000.00 1,550,000.00 2,325,000.00 1,730,000.00 1,730,000.00 1,730,000.00 1,825,000.00 1,825,000.00 1,825,000.00 1,825,000.00 1,250,000.00	250,000.00 274,500.00 194,000.00 194,000.00 271,900.00 243,000.00 166,500.00 278,000.00 248,500.00 197,500.00 197,500.00 103,000.00 103,000.00 204,000.00 103,000.00 103,000.00 104,000.00 105,000.00 106,000.00 107,500.00	1,675,000.00 2,025,500.00 1,025,500.00 1,331,000.00 1,331,000.00 1,330,300.00 2,047,000.00 1,553,500.00 1,553,500.00 972,000.00 972,000.00 1,617,000.00 1,617,000.00 1,017,000.00	
032701049 067201089 913535357 642423065 167385405 882526637 338298422 931447906 741549000 331857046 933318429 961566290 937871907 750931080 934847002	Rojas Fernandez Rojas Nunez Rojas Nunez Ruiz Navarro Jáenz Montero Salas Bermúdez Salas Chaves Salazer Mora Sánchez Cerdas Sánchez Zúñiga Segure Materrita Segure Rojas Solano Barrentes Solano Fonseca Solano Ramírez Sota Quesada Taylor Valverde Ugalde Colvo	Juan Cartos Cristina Carlos Maria Carmen Maria José Juan Marielos Edgar Valeria Andrés Luis Guillermo Manuel Luis Roberto Pedro Jesús Juan	2,25,096.00 2,300,000.00 1,725,000.00 1,725,000.00 1,725,000.00 1,550,000.00 1,550,000.00 2,235,000.00 1,750,000.00 1,750,000.00 1,750,000.00 1,255,000.00 1,255,000.00 1,255,000.00 1,255,000.00 1,255,000.00 1,255,000.00 1,255,000.00 1,255,000.00 1,255,000.00	254,000.00 274,500.00 194,000.00 271,000.00 243,000.00 160,500.00 276,900.00 197,500.00 197,500.00 193,900.00 193,900.00 244,500.00 244,500.00 246,500.00 246,500.00 246,500.00 246,500.00 246,500.00 246,500.00 266,600.00 266,600.00 266,600.00 266,500.00 266,500.00 266,500.00 266,500.00 266,500.00 266,500.00 266,500.00 266,500.00	1,873,000.00 2,025,500.00 1,025,500.00 1,331,000.00 1,332,000.00 1,330,500.00 2,047,000.00 1,553,500.00 2,047,000.00 2,197,300.00 2,025,300.00 1,637,000.00 2,111,500.00 1,279,000.00	
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Consulte el archivo de texto adjunto para referencia.

Consideraciones de implementación.

Tenga en cuenta las siguientes restricciones o requisitos al implementar la solución:

1. El programa se completará usando **C++** con **NetBeans**. Puede utilizar el compilador gcc en Linux o uno equivalente en Windows (MinGW o Cygwin). Si utiliza el IDE NetBeans, entregue la carpeta completa del proyecto. Si decide no utilizar NetBeans, deberá incluir un archivo *make* para compilar el programa.

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- 2. Tome en cuenta que el archivo contiene texto UNICODE y usa caracteres de nueva línea ('\n') para separar cada registro. Si desea abrir los archivos, tanto el que contiene los datos como el reporte de ejemplo, deberá utilizar un editor adecuado, como Notepad++, Sublime Text o el editor del IDE. En particular, el bloc de notas de versiones antiguas de Windows puede no mostrar el formato de los archivos correctamente.
- 3. **El programa abrirá el archivo de datos una única vez** y leerá todos los datos de los empleados. No se permite abrir el archivo varias veces o reiniciar el apuntador de lectura para leer los datos más de una vez.
- 4. **No es permitido usar ninguna colección** de la STL (listas, arreglos, vectores, etc.) ni de ninguna otra biblioteca. Si debe manejar una lista o alguna estructura para manejar la colección de datos, deberá usar su propia implementación.
- 5. Puede usar cualquier algoritmo de ordenamiento que quiera (la eficiencia del algoritmo no es importante), pero debe escribir el método correspondiente (sin utilizar ninguna función de biblioteca).

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