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|  | http://alimentos2014.epn.edu.ec/logo_epn_android.jpg | | **ESCUELA POLITÉCNICA NACIONAL ESCUELA DE FORMACIÓN DE TECNÓLOGOS** | | | | | |  |
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|  | **GUIA DE PRÁCTICAS  LABORATORIO TALLER 3  MÉTODO DOS FASES** | | | | | |  |
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|  | **CARRERA:** |  | **ASA**  \_\_\_ **ASI** \_X\_ **EM** \_\_\_\_ **ET** \_\_\_ | | | |  |  |  |
|  | **ASIGNATURA:** | | Investigación de Operaciones | | **CÓDIGO:** | TSI-434 | **GRUPO:** | GR1 |  |
|  | **FECHA:** |  | 08/11/15 | |  |  |  |  |  |
|  | **APELLIDOS Y NOMBRES :** | | Sánchez Arteaga Fredy Vicente | | | | | |  |
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|  | **CÉDULA DE IDENTIDAD:** | | 1725634552 | |  |  |  |  |  |
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|  | **1. PROPÓSITO DE LA PRÁCTICA:**  -Calcular la solución óptima mediante el método de dos fases para ejercicios de programación lineal. | | | | | | | |  |
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|  | **2. OBJETIVO GENERAL:**  - Aplicar los conocimientos adquiridos en cuanto a la resolución de problemas de programación lineal utilizando el método de dos fases. | | | | | | | |  |
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|  | **3. OBJETIVOS ESPECÍFICOS:**  **-**Distinguir el beneficio del método de dos fases para la resolución de ejercicios de programación lineal.  -Recordar los pasos a seguir para la resolución de ejercicios de programación lineal a través del método de dos fases. | | | | | | | |  |
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|  | **4. DESCRIPCIÓN DE ACTIVIDADES Y PROCEDIMIENTO DE LA PRÁCTICA:**  **INSTRUCCIONES:**  • Resolver en clase los siguientes ejercicios.  • Subir al aula virtual los dos archivos comprimidos (i.e. un archivo .pdf y un archivo .xls)  • Nombre del archivo pdf: #lista.Apellido\_taller3p1.pdf  • Nombre del archivo Excel: #lista.Apellido\_taller3p2.xls  **EJERCICIOS: [1]**  **1. Resuelva el siguiente problema mediante el método de las dos fases:**    **2. Resuelva el siguiente problema mediante el método de las dos fases:**    **3. Compruebe los resultados obtenidos en 1) y 2) mediante la herramienta Solver de Excel.** | | | | | | | |  |
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|  | **http://alimentos2014.epn.edu.ec/logo_epn_android.jpg** | | **ESCUELA POLITÉCNICA NACIONAL ESCUELA DE FORMACIÓN DE TECNÓLOGOS** | | | | | |  |
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|  | **5. TÉCNICAS E INSTRUMENTOS APLICADOS:**  -MS Excel | | | | | | | |  |
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|  | **6. RESULTADOS**  **PROCEDIMIENTO.**  **1. Resuelva el siguiente problema mediante el método de las dos fases:**  **FASE I**  ①Convertir en ecuaciones las restricciones    *②*Establecer variables básicas y no básicas.   |  |  | | --- | --- | |  |  | |  |  | |  |  | |  |  |   ③Minimizar el valor de la suma de las variables artificiales.  ④Establecer primera matriz Simplex.   |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | |  |  |  |  |  |  |  |  | | **F1** |  |  |  |  |  |  |  | | **F2** |  |  |  |  |  |  |  | | **F3** |  |  |  |  |  |  |  |   ⑤Hacer ceros los valores de las variables artificiales en la función objetivo.   |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | |  |  |  |  |  |  |  | |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |     **Matriz Simplex**   |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | |  |  |  |  |  |  |  |  | | **F1** |  |  |  |  |  |  |  | | **F2** |  |  |  |  |  |  |  |  | | **F3** |  |  |  |  |  |  |  |  |     ⑥Se debe hacer 1 el elemento pivote y hacer 0 arriba y abajo del elemento pivote.   |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | |  |  |  |  |  |  |  |  | | **F1** |  |  |  |  |  |  |  | | **F2** |  |  |  |  |  |  |  | | **F3** |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | |  |  |  |  |  |  |  | |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | |  |  |  |  |  |  |  | |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |   ⑦Nueva iteración resultados:   |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | |  |  |  |  |  |  |  |  | | **F1** |  |  |  |  |  |  |  | | **F2** |  |  |  |  |  |  |  |  | | **F3** |  |  |  |  |  |  |  |  |   ⑧Se debe hacer 1 el elemento pivote y hacer 0 arriba y abajo del elemento pivote.   |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | |  |  |  |  |  |  |  |  | | **F1** |  |  |  |  |  |  |  | | **F2** |  |  |  |  |  |  |  | | **F3** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | |  |  |  |  |  |  |  | |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | |  |  |  |  |  |  |  | |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |   ⑨Nueva iteración resultados:   |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | |  |  |  |  |  |  |  |  | | **F1** |  |  |  |  |  |  |  | | **F2** |  |  |  |  |  |  |  | | **F3** |  |  |  |  |  |  |  |   ⑩**Solución:**  **Al realizar las iteraciones necesarias se determina que no tiene una solución para este problema ya que no se encuentra un punto en el que se cumplan todas las restricciones y además no representa una variable artificial en las variables básicas reiterando que no has solución. No se concluye fase I.**  **2. Resuelva el siguiente problema mediante el método de las dos fases:**  **FASE I**  ①Convertir en ecuaciones las restricciones      *②*Establecer variables básicas y no básicas.   |  |  | | --- | --- | |  |  | |  |  | |  |  | |  |  |   ③Minimizar el valor de la suma de las variables artificiales.  ④Establecer primera matriz Simplex.   |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | |  |  |  |  |  |  |  |  |  | | **F1** |  |  |  |  |  |  |  |  | | **F2** |  |  |  |  |  |  |  |  | | **F3** |  |  |  |  |  |  |  |  | | **F4** |  |  |  |  |  |  |  |  |   ⑤Hacer ceros los valores de las variables artificiales en la función objetivo.   |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  |     **Matriz Simplex**   |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | |  |  |  |  |  |  |  |  |  | | **F1** |  |  |  |  |  |  |  |  | | **F2** |  |  |  |  |  |  |  |  |  | | **F3** |  |  |  |  |  |  |  |  |  | | **F4** |  |  |  |  |  |  |  |  |  |     ⑥Se debe hacer 1 el elemento pivote y hacer 0 arriba y abajo del elemento pivote.   |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | |  |  |  |  |  |  |  |  |  | | **F1** |  |  |  |  |  |  |  |  | | **F2** |  |  |  |  |  |  |  |  | | **F3** |  |  |  |  |  |  |  |  | | **F4** |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  |   ⑦Nueva iteración resultados:   |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | |  |  |  |  |  |  |  |  |  | | **F1** |  |  |  |  |  |  |  |  | | **F2** |  |  |  |  |  |  |  |  |  | | **F3** |  |  |  |  |  |  |  |  |  | | **F4** |  |  |  |  |  |  |  |  |  |   ⑧Se debe hacer 1 el elemento pivote y hacer 0 arriba y abajo del elemento pivote.   |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | |  |  |  |  |  |  |  |  |  | | **F1** |  |  |  |  |  |  |  |  | | **F2** |  |  |  |  |  |  |  |  | | **F3** |  |  |  |  |  |  |  |  | | **F4** |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  |   ⑨Nueva iteración resultados:   |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | |  |  |  |  |  |  |  |  |  | | **F1** |  |  |  |  |  |  |  |  | | **F2** |  |  |  |  |  |  |  |  | | **F3** |  |  |  |  |  |  |  |  | | **F4** |  |  |  |  |  |  |  |  |   **Obtenido 0 en la solución de la ecuación objetivo damos por terminado la fase I y procedemos a la fas II**  **FASE II**  ⑩ Buscamos la solución factible con la función objetivo original.  ⑪Establecer nueva matriz con la función objetivo original.   |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | |  |  |  |  |  |  |  | | **F1** |  |  |  |  |  |  | | **F2** |  |  |  |  |  |  | | **F3** |  |  |  |  |  |  | | **F4** |  |  |  |  |  |  |   **⑫**Debemos hacer 0 las variables de decisión en la función objetivo   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | |  |  |  |  |  |  | |  |  |  |  |  |  | |  |  |  |  |  |  |      |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | |  |  |  |  |  |  | |  |  |  |  |  |  | |  |  |  |  |  |  |   **⑬**Resultados de la nueva iteración. Al tener la variable de holgura S1 un valor positivo debemos hacer otra iteración para encontrar la solución más factible.   |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | |  |  |  |  |  |  |  |  | | **F1** |  |  |  |  |  |  | | **F2** |  |  |  |  |  |  |  | | **F3** |  |  |  |  |  |  |  | | **F4** |  |  |  |  |  |  |  |   ⑭Al tener 1 en el elemento pivote solamente se hace 0 arriba.   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | |  |  |  |  |  |  | |  |  |  |  |  |  | |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | |  |  |  |  |  |  | |  |  |  |  |  |  | |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | |  |  |  |  |  |  | |  |  |  |  |  |  | |  |  |  |  |  |  |   ⑮ Matriz final resultados.   |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | |  |  |  |  |  |  |  | | **F1** |  |  |  |  |  |  | | **F2** |  |  |  |  |  |  | | **F3** |  |  |  |  |  |  | | **F4** |  |  |  |  |  |  |   **⑯Solución:**   |  | | --- | |  | |  | |  |   **3. Compruebe los resultados obtenidos en 1) y 2) mediante la herramienta Solver de Excel.**  ANEXO 1: Resolución Solver | | | | | | | |  |
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|  | **7. CONCLUSIONES**  **-** El método de resolución de las dos fases es el adecuado para resolver ejercicios de Programación Lineal reduciendo la redundancia.  -Con las iteraciones realizadas se determina las soluciones de los y a su vez se determina que no hay soluciones factibles en ejercicios.  -Se siguen los pasos necesarios estableciendo la diferencia entre el método de la gran M y el método de las dos fases. | | | | | | | |  |
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|  | **8. BIBLIOGRAFÍA REFERENCIAL:**  [1] H. Taha, Investigación de operaciones, 9th ed. México: PEARSON, 2012. | | | | | | | |  |
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|  |  |  |  | Fredy Sánchez | Arteaga |  |  |  |  |
|  | **FIRMA DEL ESTUDIANTE** | | | | | | | |  |