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## Introduction: Range Basic Variable Column

If  $BV$  is no longer optimal, then the new optimal solution can be found by using the formulae to recreate the entire tableau for  $BV$  and then continuing the simplex algorithm with the  $BV$  tableau as the starting tableau.

There can be two reasons why a change in an LP's parameters causes  $BV$  to be no longer optimal. First, a variable (or variables) in row 0 may have a negative coefficient. In this case, a better (larger  $z$ -value) bfs can be obtained by pivoting in a non-basic variable with a negative coefficient in row 0. If this occurs, it is said that  $BV$  is now a *sub-optimal basis*.

Second, a constraint (or constraints) may now have a negative right-hand side. In this case, at least one member of  $BV$  will now be negative and  $BV$  will no longer yield a bfs. If this occurs, it is said that  $BV$  is now an *infeasible basis*.

### Additional Research Sources

WAYNE L. WINSTON. 2004. OPERATIONS RESEARCH - APPLICATIONS AND ALGORITHMS FOURTH EDITION. ISBN 0-534-52020-0.

HAMDY A. TAHA. 2007. OPERATIONS RESEARCH - AN INTRODUCTION. EIGHTH EDITION. ISBN 0-13-188923-0.

FREDERICK S. HILLIER. 2010. INTRODUCTION TO OPERATIONS RESEARCH. NINTH EDITION. ISBN 978-9814577205.

FREDERICK S. HILLIER. 2010. INTRODUCTION TO OPERATIONS RESEARCH. SEVENTH EDITION. ISBN 978-9814577205.

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## Outline

Just like with columns of non-basic variables, ranges and changes can be applied and calculated for columns of basic variables. You are tasked to calculate a range for a column of a basic variable.

### Criteria

- Be creative in the example that you use in your explanation.
- Provide context to your example and interpret your calculations.
- Multiple examples can be used in your presentation.
- Don't just pick the easiest example you can find.
- Your Linear Programming Model should have three constraints.
- Use at least three different elements of the basic variable column to calculate the range. Show all calculations.

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## Mark Allocation

Criteria	Weight
Introduction	3
Content: Context	5
Content: Creativity	5
Content: Complexity	5
Content: Range Calculation	15
Content: Interpretation	5
Conclusion	3
Overall Presentation	4
<b>Total</b>	<b>45</b>

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## Additional Information

- All work must be done on your own.
- Belgium Campus have software that can **scan for plagiarism** and a student caught doing this will get 0 for this assignment.
- Late assignments will not be accepted; missing the deadline is an automatic 0.

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## Referencing and Citation Guide

Referencing and citations are how we prove and support our statements. They are absolutely crucial, vital, critical, imperative, fundamental, and essential!

### Referencing

There are many different styles of referencing. These styles depend on your educational institution and on the field you are in. At Belgium Campus, we use Harvard referencing. The Harvard referencing style is an author-date type of referencing. There are several variations with the most popular one being the Harvard Anglia referencing style. Let's look at an example:

## References

- Aarons, D. and P. Akach. 1998. South African Sign Language-one language or many? A sociolinguistic question. *Stellenbosch Papers in Linguistics* 31: 1-28.
- Al-Fityani, K. and C. Padden. 2008. A lexical comparison of sign languages in the Arab world. In R.M. de Quadros (ed.). *Sign Languages: Spinning and unraveling the past, present and future. TISLR9, forty-five papers and three posters from the 9th Theoretical Issues in Sign Language Research Conference, Florianopolis, Brazil, December 2006*, 2-13. Petropolis, Brazil: Editora Arara Azul.
- Baker, A., B. van den Bogaerde, R. Pfau and T. Schermer (eds.). 2016. *The linguistics of sign languages: An introduction*. John Benjamins Publishing Company.
- Clark, B. 2017. Sign Language Varieties in Lima, Peru. *Sign Language Studies* 17(2): 222-264.
- Crowley, T. and C. Bowern. 2010. *An introduction to historical linguistics*. Oxford University Press.
- Dixon, R.M. 1997. *The rise and fall of languages*. Cambridge University Press.
- Gudschinsky, S.C. 1956. The ABC's of lexicostatistics (glottochronology). *Word* 12(2): 175-210.
- Johnston, T. 2003. BSL, Auslan and NZSL: three signed languages or one?. In A. Baker, B. van den Bogaerde and O. Crasborn (eds.). *Cross-linguistic perspectives in sign language research: selected papers from TISLR 2000*, 47-69. Hamburg: Signum.

### Important notes:

- The most important information here – the author, the date, and the title of the article
- If your source does not have an author and is instead published by an institution e.g. the Massachusetts Institute of Technology, use the corporate author feature in Word.
- Use the tools provided by Microsoft Word. You can find a guide [here](#).
- The reference list is automatically populated using MS Word's tools. It is alphabetical and not numbered. It has its own page at the end of your document.

### Citations

If the information we are typing is not general knowledge within the field or is not our own work we need to state where this information came from. We do this through a citation. A citation is a link to one of the references on our list.

For example:

Here I paraphrase what I found on the internet:

Despite several experiments, there does appear to be a consistent link between the ZPD and acrimony.

This is not my own information. In my reference list is the reference to the source:

Vygotsky, L., 1978. *Mind in Society*. London: Harvard University Press.

This means I *need to use a citation*. It is simple to insert a citation from my sources using the MS Word tools. The paraphrase with my citation is:

Despite several experiments, there does appear to be a consistent link between the ZPD and acrimony (Vygotsky, 1978).

I can also directly refer to the author. For example,

Vygotsky (1978) pioneered the research in pedagogy and didactics through the Zone of Proximal Development theory.

Here my citation only has the year since I already stated the author. This is also made straightforward with the MS Word tools.

If I am using specific information from a book or article, I need to include the page numbers. I can't expect my reader to search through a book for a piece of information. You can do this using the MS Word tools. For example:

Within the field of robotically assisted surgery, Davis (2018, p. 204-207) found that patient trust in the doctor was the deciding factor.