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ESD.70J / 1.145J Engineering Economy Module
Fall 2009

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ESD.70J Engineering Economy

Fall 2009
Session Zero

Michel-Alexandre Cardin
Prof. Richard de Neufville

Class outline

1. Objective: get you up to speed for Session 1!
 - Excel versions and languages
 - Excel basics for ESD.70
 - Few tricks to speed up analysis
 - More learning material


Excel versions

- Versions currently “in use”
 - PC: 2000, XP or 2003, 2007
 - Mac: 2004, 2008
 - Open source: Open Office Calc (see website)
- Many, many languages
 - Chinese, English, French, Japanese, Spanish...
 - Obviously cannot support all (see website for handy tips in French and Spanish)

Recommended versions

- Class supported in Excel 2007 for PC, and Excel 2004 for Mac
- Why?
 - Excel 2007 widely used on PC
 - Excel 2008 for Mac does not support Solver and other functionalities required for class
- Make sure you have one of those installed!
- Ask your department for a free copy of software

Course Materials

- Excel spreadsheets
 - ESD70session# -1.xls : setup before the class
 - ESD70session# -2.xls : reflects all the work done in class
 - Do the exercises with me → the only way to learn
 - Cells marked as  are for you to fill
 - Refer to the ESD70session# -2.xls to validate your work
- Lecture in PDF on course website

Excel basics

Open ESD70session0-1.xls

Excel basics

- Entering numbers and formulas
- Working with multiple sheets
- Manual vs. automatic calculations

Big vs. Small setup

- Building a computer plant
- Deterministic demand projections for years 1, 2 and 3 are 300,000, 600,000, and 900,000 respectively
- No sales in year 4 or thereafter
- Plan A – a big plant; Plan B – one small plant each year;
- Plants take a few months to construct
- Big plant capacity of 900,000 with capital cost of \$900 million
- Each small plant capacity of 300,000 with capital cost of \$300 million
- No salvage value for Plan A; \$300 million salvage value for Plan B
- Discount rate for Plan A is 9%, and 8% for Plan B
- The company will sell each computer for \$2,000
- Variable cost for Plan A is \$1,280 due to economies of scale; Variable cost for Plan B is \$1,500
- See “Entries” Worksheet...

Entering numbers and formulas

- Click on 'Entries' tab
 - Fill in yellow cells as per case assumptions
 - E.g. enter "9%" in cell D3, "8%" in cell D4
- Click on 'Plan A' tab
 - Fill in yellow cells, guided by comments
 - Referencing fields across sheets (and files)
 - E.g. enter "1" in cell E3, "`=Entries!D14*'Plan A'!E3`" in cell E4

Manual vs. automatic calculations

- How to set it up
 - Mac: Excel \Rightarrow Preference \Rightarrow Calculations
 - PC: Excel \Rightarrow Excel options \Rightarrow Formulas
- Shortcuts
 - “F9” on PC and “command” = on Mac

Few more Excel tricks...

- Copy and paste, paste special
- Entering Series
 - Down...
- Cell formatting
- Charts primer
- '\$' fixed cell references
 - Shortcuts “F4” on PC and “command T” on Mac

More learning material

- Excel 2004 for Mac:

<http://web.mit.edu/macardin/Public/docsESD70/DiscoveringMicrosoftOffice2004.pdf>

- Excel 2007 for PC:

<http://office.microsoft.com/en-us/training/HA102255331033.aspx>

Next session...

We begin the main session about NPV,
Sensitivity Analysis and Data Tables