

# Parametric Estimation in 27 Steps

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# Step 1: Start ShipWeight and Log on

	Login
Л	<b>ShipWeight</b>
Authenticatio	n: Windows 🗸
SQL Server:	RAA-PC\SW ✓
User Name:	Administrator
Password:	••••
System:	Standard V
	<ul> <li>Open Last Project</li> </ul>
ОК	Cancel

Start ShipWeight and log in to ShipWeight using the user name "Administrator" and password "admin".



#### Step 2: Start a New Project

	Standard 12.20.02.01 - 5
Project Edit View Database Weight Groups Items Ch	ecking Std.dev. Estimate Help
L 🖓 🖬 🕅 🥅 📾 🗆 🚠 🏘 🗖 🚈 🔛	▲▲ ☆  * ♪ ⊷
No project open	Filter:
Weight Groups Weight [t] Std.dev.[%]	VCG [m] Std.dev.[%] LCG [m] Std.dev.[%] TCG [m] Std.dev
<u> </u>	Project Info 🦳 🗖 🗙
G	eneral Additional
D	atabase ID*: ProjectDB 🗸
P	roject ID*: Turtorial *Mandatory
U	se Parents:
N O M T R R F I O O U	ame: wmer: ain Type: in Type: Anchor Handling Tug egistration Pers.: Autometerator egistration Date: 30/10/2017 rame Spacing: 1# oord.ref.point: VG: 0LG: 0TG: 0 TG: 1 CG: VI CG: VI OK Cancel

When ShipWeight opens, click the "New" button on the toolbar and select "ProjectDB" as Database ID, set "Tutorial" as Project ID, and select Main Type "Offshore Vessel" and sub type "Anchor Handling Tug". You may also give in a vessel name if you'd like, but this is not necessary. Hit the "OK" button.



# Step 3: Enter Ship Parameters

<u>77</u>	Parameters							
Parameters Main Parameters Vik	tige par RRM							
A Parameter	Value Std.dev.[%]							
MAIN DIMENSIONS								
-Ship length over all [m]	74							
-Length betw. perp. [m]	69							
—Ship beam [m]	21							
Depth upperm. cont. deck	[m] 7.5							
Depth to maindeck [m]	7.5							
Draught_OWL [m]								
—Scantling draught [m]								
Displacement [t]	<b>Pers</b>							
▲ CAPACITIES								
Numb. passengers [-]								
Numb. crew [-]								
-Numb. cars [-]								
Numb. containers [-]								
▲ TONNAGE								
Gross tonnage [GT]	and the second se							
-Net tonnage [NT]								
Deadweight [t]								
Main engine power [kW]	11000							
Nome-main engines [ ]								
Rot.speed main engine [rpr	n]							
Propeller diameter [mm]								
Main hull material								
BIOCK COefficient [-]	0./1							
Defined Only								
Print	OK	Cancel						

In the "Main Parameter" window that shows up, give in at least the parameters as shown above. You may give in other parameters as well if you like.



# Step 4: Select the Demo Ship Historical Database

				:	Standard 12.20.	.02.01 [ProDB(Tu	torial)] - ShipV	Veight Enterpris	e
Project Edi View Jatabase Weigh	ht Groups Items Checkin	g Std.dev. Estin	nate Help						
Project Info		≝  <u>⇔</u>  # 1							
Main Parameters						Filter:			
Parameters Method Values	Weight [t]	Std.dev.[%]	VCG [m]	Std.dev.[%]	LCG [m]	Std.dev.[%]	TCG [m]	Std.dev.[%]	v
Drawing +									
Comment •									
Code Definition	,,,,,,, _	0	Intions		? ×				
Code Envelopes	ŧ.		ptions						
Code Mapping	General Decimals Qu	antit Database I	og Report Ite	m Estimation V	Vorks 1 +				
Code Summary		/—							
Compare	Path Historical Databas	e: RAA-PC\SV	/ - Demo						
Weight Distribution	Project Database Prefi								
Gyradius	in oject be abase men.	··	1-						
Executive Summary	Log B:	l <b>√</b> ]On l <b>√</b>	Import						
Trend Lines	Connection Timeout:	0							
Load Conditions	Record Buffer:	10000				Specify histo	orical database		×
Module Wgt. Distribution	Cause sales distant university				Server				ר
Options	Save calc, distr. values				Server.	RAA-PC\SW		ОК	J
✓ Toolbar					Database:	selh Domo		Cancel	
✓ Status Bar						ab_Demo ab_ahipab			
					•				
	Import			OK C					
					Project ID:				

Next, go to the View menu and select the "Options…" window. Click the "Database" tabsheet in the Options window, and select the "Browse" [...] button next to the "Path Historical Database". In the pop-up dialog from the browse, select the "sdb\_Demo" database in the list and hit the "OK" button. Next, hit the "OK" button on the Options dialog.



#### Step 5: Activate the Demo Ships in Reference Project Window

		<u> </u>	_		Standard 12.2	0.02.0	1 [ProDB	(Tutorial)] -	ShipWeight Enterpri
Project Edit View Database Weight Groups	Items Checking	Std.dev. Es	timate	Help					
□ 📽 🖬 🕅 🖩 🖩 Σ 🚠 🗛 🕼	Auto Estimatio	on							
ProDB (Tutorial)	Define Method	ds					Filter	:	
Weight Groups	Project Types			CG [m] Std.dev.[%]	LCG [m]		Std.dev.[%]	TCG [r	n] Std.dev.[%]
⊿ ····← DISP - Displacement	Reference Proj	ects							
	Weight								
l→ <sup>H</sup> ⊖ <sup>v</sup> DW - Deadweight	VCG								
tw IW - Lightship	~			Poforon	co Drojosta			ł	- <b>-</b> X
	~			Referen	ce Projects				
	Project ID	Project Name	Type ID	Type	Build Year Vard	Owner	Ice class	Length over A	Caster Project
	Project 10	Trade Char	Type ID	Type	build real Taru	Owner	ICE Class	Lengarow	
	R DS_1	Tank Star	100	Tanker for Oil	2000				eference Project
		Tarik Lion	100	Tanker for Oil	2000				
	R DS_3	Tank Tiger	100	Tanker for Oil	2000				Reference Projects
		Tank Fund	100	Tanker for Oil	2000				Include All
		Tank Sensation	100	Tanker for Oil	2000				
	R DS 7	Tank Champion	100	Tanker for Oil	2000				Exclude All
	R FA001	Bas Eighter	605	Anchor Handling Tug	1997				View
	R FA002	Bas Staver	605	Anchor Handling Tug	1997				Design to Table
	R FA003	Bas Spirit	605	Anchor Handling Tug	1997				Project Info
	R FA004	Bas Viking	605	Anchor Handling Tug	1997				Main Daram
	R FA005	Bas Breaker	605	Anchor Handling Tug	1997				Main Paraman
	R FA006	Bas Super	605	Anchor Handling Tug	1997				Parameters
	R FA007	Bas Dire	605	Anchor Handling Tug	1997				
	R FA008	Bas Straits	605	Anchor Handling Tug	1997				Method Data
	R FA009	Bas Gentle	605	Anchor Handling Tug	1997				
	R FA010	Bas Ruler	605	Anchor Handling Tug	1997				Edit
	R FA011	Bas Leader	605	Anchor Handling Tug	1997				Add Project
	R FA012	Bas King	605	Anchor Handling Tug	1997				
	R GVA(P-1010)	MS Gunnerside	100	Tanker for Oil	2014				Delete Project
	<b>R</b> R1	Real Survivor	901	Research Ship	1995				Import & Evport
	R R2	Real Fighter	901	Research Ship	1997				Import & Export
	R R3	Real Artist	901	Research Ship	1999				Copy to Clipboard
	R R4	Real Viking	901	Research Ship	1991				
	R R5	Real Challenge	901	Research Ship	1990				Paste Cipboard
	R R6	Real Motion	901	Research Ship	1992				Import hist dh
	RR7	Real Keeper	901	Research Ship	1993				Imporchisedo.
	RR8	Real American	901	Research Ship	1994				
	K R9	Real Hero	901	Research Ship	1996				
	R SA001	Active Hero	809	Salvage Ship and Ice Breaker	1987				
	P SAUU3	Active GIN	809	Salvage Ship and Ice Breaker	1000			~	
	< Same	ar ilve Horse	2019	Savare Shin and Ice Breaker	(991)			>	
	<b></b>							01	
	Print							OK	Cancel
I L									

Next, head to the "Estimate" menu and select "Reference Projects..." window. In this window, selec the "Include all" button and hit "OK" button. This activates all the reference projects that in the demo database that was selected in previous step. We now have a basis ready for the parametric estimation.



# Step 6: Select the Lightship Weight Group and Open the Estimation Window

				St	tandard 12.20.0	02.01 [ProDB(Tu					
Project Edit View Database Weight Groups	ltems Checkin	ng Std.dev. Estim	ate Help								
🗋 🗅 😅 🖬   🕅 🕅 🎟 🏛 🎞 🛤   🏂 🚹	≤ IĽ I & A ⊿	• ك *   🗠   🏝	-								
ProDB (Tutorial)											
Weight Groups	Weight [t]	Std.dev.[%]	VCG [m]	Std.dev.[%]	LCG [m]	Std.dev.[%]					
⊿ ···· → DISP - Displacement											
R DR - Remainder displacement											
i— <sup>t</sup> ⇔⊻ DW - Deadweight											
LW - Lightship											

Select the "LW – Ligthship" group in the main window WBS and clikc the estimation graph button in the toolbar to open the estimation dialog. We are now ready to estimate the Ligthship.



# Step 7: Estimate Lightship Weight

		Estimatio	on						
View Graph Wgt.grp. Std.dev.	Estimate Method Setting Window								
🔲 W - Weight 🔻 🖉 🏭	▋᠌ヱ゚゚゙゙゜ゖ゙゙゙゙゙゙゙゙ヾ゚゚゚ヽヽ゚゚゚゚ヽ	<u>+</u>							
k = W/Lpp*B*D*Cb^0.5 y = 0.524+-0.0146*Ln(x)	LW Lightship weight (12 of 35 reference proje	[t] cts)	Parameter Length betw Ship beam Depth uppe Block coeff Coefficient	w. perp. [m] [m] erm. cont. deck [m] îcient [-] type	I	Coeff.v	Std.dev	Value 69.00 21.00 7.50 0.710 Value	Std.dev
							0.00		0.00
0.42		۲	Regression			0.389	7,19	3 562	0.00
Ĩ		$\cup$	Derault			0.345	15.11	3 154	0.00
	•	0	Sister proje	ect		0.000	0.00	0	0.00
0.39	••••••••••••••••••••••••••••••••••••••	0	Adj.sister p	roject		0.000	0.00	0	0.00
	••	0	Average			0.389	7.36	3 563	0.00
0.36			W = k*Lpp	*B*D*Cb^0.5		Coeff.v	Std.dev	Value	Std.de
			Weight[t]			0.389	7.19	3 562	
	•	Ind	Jde ID	Name	Туре		Bui	It Cubiono, u.	.dk. Weigl 🔨
0.33	· · · · · · · · · · · ·		FA011	Bas Leader	Anchor Ha	andling Tug	199	7 10 9	557 3 44
3000 6000 9000	12000 15000 18000 21000	<							>
Comparison parameters	Filter	ProDI	5 -						
Build Year	<u>1900-2017</u>	20	47						
Project Type	Offshore Vesse Ancho	or Handling T	ug						
1. Lpp/B [-]	0.000-1 000 0	-iii 3	29						
2. Maximum speed [knot]	0.0-100.0		_						
3. Numb. decks, main hull [-]	0-20		_						
4. Length betw. perp. [m]	0.00-450.00	69	.00						
5. Ship beam [m]	0.00-100.00	21	.00						
6. Depth upperm. cont. deck [m]	0.00-100.00	7	.50						
7. Scantling draught [m]	0.00-30.00		_						
8. Main hull material			_						
9. Block coefficient [-]	0.000-1.000	0.3	10						
10. Double hull	All								
Weight[t]		3 !	62						
<		_	> <		_		_	_	>

In the graph window, select the "Regression" radiobutton to execute an estimation based upon selecting a coefficient for the method from the regression line. Next, click the "Save" button to save your initial Lightship estimate.



# Step 8: Estimate Lightship VCG

<u> </u>		Estin	nation						-		
View Graph Wgt.grp. Std.dev.	Estimate Nethod Settin	g Window									
W - VCG Use Plot Coeff.		· • • •									
Use Plot Std.dev.											
k = VCG/D Old Methods	LW Lig	htship VCG [m]	1	Parameter					Value	Std.dev	
9:23= 0.68 Weight	(12 of 28 r	reference projects)	-	Depth upperm	. cont. deck [m	]			7.50		
VCG											
0.9 LCG											
• TCG	•		0	Coefficient typ	e		Coeff.v	Std.dev	Value	Std.de	
	· · .	1	0	Regression			0.846	4.53	6.35	0.00	
•	•			veraun			0.000	0.77	0.00	0.00	•
			0	5ister project			0.000	0.00	0.00	0.00	
0.84			0	Adj.sister proje	ect		0.000	0.00	0.00	0.00	
•	•		0	Average			0.856	4.58	6.42	0.00	
0.81			`	VCG = k*D			Coeff.v	Std.dev	Value	Std.de	
				VCG[m]			0.846	4.53	6.35		Ц
· · ·			Include	E ID	Name	Type		Built	t Depth upper	m. cont. d	1
0.78		5 10 D	••	FA011	Bas Leader	Anchor Han	ialing Tug	199/			~
, ,,, ,,,			<	1						>	_
Comparison parameters Build Year	Filter		2017								
Project Type	✓ Offshore Vesse…	Anchor Hand	dling Tug								
1. Double hull											
2. Numb. decks, main hull [-]	0-20										
3. Numb. transv. bulkh. in main hull [-]	0-20										
4. Froudes number [-]	0.000-1 000 0		-								
5. Ice class	All										_
6. Height dbl. btm., main hull [mm]	0-10 000										_
7. Depth upperm. cont. deck [m]	0.00-100.00		7.50								_
vCG[m]			6.35								—

Go to the "Estimate" menu in the Estimation window and select "VCG" to start estimating the initial LightShip VCG value. Selct the "Regression" radiobutton to estimate the VCG value for the lightship and hit the "Save" button on the toolbar to save.



# Step 9: Estimate Lightship LCG

<u>~</u>		Estir	mation						-	□ ×	
View Graph Wgt.grp. Std.dev.	Estimate lethod	d Setting Window									٦
Use Plot Coeff.											
Use Plot Std.dev	<i>.</i>										
k = LCG/Lpp Old Methods		LW Lightship LCG [m]		Parameter					Value	Std.dev	
9 = 0.443*e*		(12 of 28 reference projects)		Length betw.	perp. [m]				69.00		
weight											
0.6 V LCG				Coefficient typ	)e		Coeff.v	Std.dev	Value	Std.de	
TCG			0	5ubjective			0.000	0.0383	0.00	0.00	
0.55			۲	Regression			0.518	4.04	35.76	0.00	
	• •		0	20 march			01000	0.57	0100	0.00	
+	<u> </u>		0	5ister project			0.000	0.00	0.00	0.00	
0.5	•		0	Adj.sister proj	ect		0.000	0.00	0.00	0.00	
			0	Average			0.518	4.52	35.76	0.00	
0.45				LCG = k*Lpp			Coeff.v	Std.dev	Value	Std.de	
1 Ť						-	0.518	4.04	35./6		_
			Include		Name	lype	- JI: T	Buil	t Length betw	een perpe	
		94 01 DD	••	FA011	·	Anchor Hai	naling Tug	199/			~
49 56 63	/0 //	84 91 499	<							>	
Comparison parameters	Filter		ProDB -								
Build Year	<u>1900-2017</u>		2017								-
Project Type	Ottshore Vesse	Anchor Han	dling Tug								-
1. Rake of keel [-]	0.00-1 000 00										-
2. Froudes number [-]	0.000-1.000 0		681 0								-
LCG wheel house over shiplength [-]			681								-
4. Numb. decks, main nui [-]			co. 00								-
S. Length betw. perp. [m]	0.00-450.00		35.76								-
reating			22170								

Repeat the same steps as above, but now for selecting the LCG instead of VCG, and after this, close the window by clicking the Close (Door) button on the toolbar.



# Step 10: Lock Lightship Estimate and Select Subgroup

<u>~</u>				S	tandard 12.20.0	2.01
Project Edit View Database Weight Group	s Items Checking	Std.dev. Estin	nate Help			
🗋 🗅 😅 🖬   🎌   🎟 🎟 🇵 🏯 🛤   🏄	k i 🖾 🛋 🛎	: 🌨   ★ 뇌	•			
ProDB (Tutorial)						
Weight Groups	Weight [t]	Std.dev.[%]	VCG [m]	Std.dev.[%]	LCG [m]	9
a DISP - Displacement	3 562 💁		6.35		35.76	
R DR - Remainder displacement						
l → ···· <sup>H</sup> @ <sup>v</sup> DW - Deadweight						
LW - Lightship لنظ	3 562 🗽		6.35		35.76	
i <sup>t</sup> ⊕ <sup>v</sup> E - Equipment						
M - Machinery						

You should now see the results of the Lightship estimation in the main window. Click the Lock (key) button on the right end of the toolbar to lock the estimated numbers before we go refine the estimate. Next, select the "Equipment" weight groups in the main window and once again click the graph icon on the toolbar to open the Estimation window.



# Step 11: Estimate Weight of Equipment Group

		Estir	nation	i .				-	×
View Graph Wgt.grp. Std.dev.	Estimate Method	d Setting Window							
🔲 🗗 Weight 🗸 🖨 🗄	≝Zî k∢	▲ ▼ ▶ ▶ №							
k = W/Lpp*8 y = 0.569+0.0025*x ∲≇4 0.0924	E •	Equipment weight [t] (12 of 19 reference projects)		Parameter Length betw. perp. [m] Ship beam [m]				Value 69.00 21.00	Std.dev
0.77	•		0	Coefficient type		Coeff.v	Std.dev	Value	Std.de
·	•	•••••	0	Pennession		0 729	9.46	1.059	0.00
0.7			6	Defeult		0.730	11.96	1 147	0.00
			0	Sister project		0.000	0.00	0	0.00
0.63			ŏ	Adi.sister project		0.000	0.00	0	0.00
1 T			ŏ	Average		0.737	9.95	1 068	0.00
			-	W = k*Lpp*B		Coeff.v	Std.dev	Value	Std.de
0.56				Weight[t]		0.738	9.46	1 069	
•			Includ	e ID Name	Туре	Built	Length bet	ween perpendi	cals Weig 🔨
0.49			✓ •	FA011 Bas Leader	Anchor Handling	Tug 1997		6	7.30 9
49 56 63	70 77	84 91 Lpp	<					-	> `
Comparison parameters	Filter		ProDB -						
Build Year	<u>1900-2017</u>		2017	,					
Project Type	✓ Offshore Vesse	Anchor Hand	dling Tug	1					
1. B/D [-]	0.000-1 000 0		and 2.80	1					
2. Volume holds over shiplength [m2]	0.000-1 000 0		00	1					
3. Numb. decks, main hull [-]	0-20								
4. Numb. holds, cargo area [-]	0-20								
5. Length betw. perp. [m]	0.00-450.00		69.00	1					
6. Ship beam [m]	0.00-100.00		21.00	1					
Weight[t]			1 069						
<			>	< .					>

Repeat the steps from the Lightship estimation: Select the "Regression" radiobutton to execute an estimation based upon selecting a coefficient for the method from the regression line. Next, click the "Save" button.



# Step 12: Estimate VCG of Equipment Group

		Estimation	١			_ (	×
View Graph Wgt.grp. Std.dev.	Estimate Method Setting Win	ndow					
Use Plot Coeff.		N 11.*					
Use Plot Std.dev							
k = VCG/D Old Methods	E Equipment	VCG [m]	Parameter			Value	Std.dev
y = 1.148+-0 1-2 = 0.50	(12 of 12 reference	e projects)	Depth upperm. cont. deck [m]			7.50	
Weight							
• VCG							
			Coefficient type	Coeff.v	Std.dev	Value	Std.de
100			Subjective	0.000	0.0698	0.00	0.00
1.14	• •	<u> </u>	Regression	1.126	3.14	8.45	0.00
•	• •	0	Derault	0.000	1.31	0.00	0.00
1.11	•		Sister project	0.000	0.00	0.00	0.00
+		0		1 175	3.15	8.44	0.00
•		0	VCG = k*D	Coeff.v	Std.dev	Value	Std.de
1.08			VCG[m]	1.126	3.14	8.45	
		Includ	e ID Name Type	Built Dep	th upperm.	cont. deck VCC	3 Coeffic 🔺
1.05			FA011 Bas Leader Anchor Handling Tug	1997		8.30 9.4	6 1
7 7.5 8	8.5 9 9.5	10 D <					- · · · · · · · · · · · · · · · · · · ·
Comparison parameters	Filter	ProDB -					
Build Year	<u>1900-2017</u>	201	7				
Project Type	✓ Offshore Vesse…	Anchor Handling Tug					
1. Depth upperm. cont. deck [m]	0.00-100.00	7.5					
VCG[m]		8.4	5				

Repeat the steps from the Ligthship VCG estimation: Go to the "Estimate" menu in the Estimation window and select "VCG" to start estimating the initial Equipment VCG value. Select the "Regression" radiobutton to estimate the VCG value for the equipment and hit the "Save" button on the toolbar to save.



#### Step 13: Estimate LCG of Equipment Group

		Estimation							-	×	
View Graph	Wgt.grp. Std.dev.	Estimate Method	Setting Wind	low							
-LCG	Use Plot Coeff.		A <b>T</b> b bl	<b>N</b> *							
	Use Plot Std.dev	· .	- • • •	4-							
k = LCG/Lpp	Old Methods	E	Equipment	LCG [m]		Parameter				Value	Std.dev
9_0.300 E	Weight	()	2 of 12 reference	projects)		Length betw. perp. [r	nj			69.00	
	VCG										
0.63	✓ LCG					Co-fficient have		C#	Chil dans	Mahaa	<b>Chi da</b>
	TCG				0	Subjective		0.000	0.0354	value 0.00	0.00
0.585		· ·		ſ	۲	Regression		0.566	3.39	39.04	0.00
•		• •		- L	0	Denadic		01000	0102	0100	0.00
+		•			0	Sister project		0.000	0.00	0.00	0.00
0.54	. • •				0	Adj.sister project		0.000	0.00	0.00	0.00
					0	Average		0.566	3.70	39.04	0.00
0.495						LCG = k*Lpp		Coeff.v	Std.dev	Value	Std.de
					Includ	e ID Name	Type	Built Ler	oth betwee	n perpendicals	
0.45					✓.	FA011 Bas Leader	Anchor Handling Tug	1997		67.30	37.86
49	56 63	70 77	84	91 Lpp	<						···· , *
Comparison param	eters	Filter			ProDB -						
Build Year		<u>1900-2017</u>			2017	,					
Project Type		✓ Offshore Vesse…		Anchor Hand	lling Tug	1					
1. Length betw. pe	erp. [m]	0.00-450.00			69.00						
LCG[m]					39.04	H					
S					>	٢					>

Repeat the steps from the Ligthship LCG estimation: Go to the "Estimate" menu in the Estimation window and select "LCG" to start estimating the initial Equipment LCG value. Select the "Regression" radiobutton to estimate the LCG value for the equipment and hit the "Save" button on the toolbar to save.

#### Step 14: Move to Hull Group

	Estimation						
View Graph Wgt.grp. Std.dev. Estimate Method	Setting Window						

Click the toolbar button with the right arrow as marked above to move to the next weight group on the same level (Hull) without closing the estimation Window.



#### Step 15: Change Weight Estimation Formula for Hull

×	Estima	Estimation – 🗆 🗙								
View Graph Wgt.grp. Std.dev. Estimate Method	Setting Window									
V y V Default	↓ ↓ ⊨ №									
Main Parameter										
k = W/C0.7*E^1.36	H Hull weight [t]	Parameter		Value Std.dev						
y = -0.0160+0.0095*Ln(x Main Wgt.grp.	2 of 19 reference projects)	Adjusted blockcoefficient [-]								
D		Watson E-parameter [m2]								
	1									
0.072	-	Coefficient type	Coeff.v Std.dev	Value Std.de						

In the Hull weight group the standard formula is using the Watson E-parameter. We do not have the details at hand to fill this in, so instead we will change formula. Go to the "Method" menu and select Main Parameter as the method to use instead of the Default method. The method will now change to a formula only containing the main parameters and we do not have to enter more information to carry out the estimation.

#### Step 16: Estimate the Hull Weight

		Estir	mation					-	×
View Graph Wgt.grp. Std.dev.	Estimate Method	Setting Window							
-Weight 🗸 🖨 🎚		▲ <b>▼</b> ▶ ▶ <b>№</b>							
k = W/Lpp*B*D	:	H Hull weight [t]	P	arameter				Value	Std.dev
<b>9</b> = 0.191+-0.0000 °X	(1	12 of 19 reference projects)		ength betw. perp. [m]				69.00	
			5	nip beam [m] )enth upperm_cont_de	ck [m]			21.00	
				epur appentit conti de	ek [m]			7.50	
0.24			c	oefficient type		Coeff.v	Std.dev	Value	Std.de
			0 5	ubiective		0.000	0.0090	0	0.00
0.21			R	egression		0.177	10.51	1 922	0.00
1†			0.	erool		01000			0.00
			0 s	ister project		0.000	0.00	0	0.00
0.18	• •		A 1	dj.sister project		0.000	0.00	0	0.00
•		<b></b>	A 1	verage		0.176	11.08	1 912	0.00
0.15	•	•	v	V = k*Lpp*B*D		Coeff.v	Std.dev	Value	Std.de
•			v	Veight[t]		0.177	10.51	1 922	
			Include	ID Name	Туре	Built	Cubio-no, u	.dk. Weight Co	oefficient \land
0.12			✓ •	FA011 Bas Leader	Anchor Handling	Tug 1997	10	557 1 898	0.180
3000 6000 9000	12000 15000	18000 21000 LBDu	<						>
Comparison parameters	Filter		ProDB -						
Build Year	<u>1900-2017</u>		2017						
Project Type	✓ Offshore Vesse…	Anchor Hand	dling Tug						
1. Lpp/B [-]	0.000-1 000 0		3.29						
2. B/D [-]	0.000-1 000 0		2.80						
3. Numb. decks, main hull [-]	0-20								
4. Ice class	All								
5. Block coefficient [-]	0.000-1.000		0.710						
6. Numb. water ballast/heeling tanks [-]	0-50								
7. Watson E-parameter [m2]	0.000-1 000 0		÷.						
8. Length betw. perp. [m]	0.00-450.00		69.00						
9. Ship beam [m]	0.00-100.00		21.00						
10. Depth upperm. cont. deck [m]	0.00-100.00		7.50						
Weight[t]			1 922						
<			>	<					>

Now estimate the Hull weight by selecting the "Regression" radiobutton and save the result.



# Step 16: Estimate the Hull VCG

		Estim	ation				-	
View Graph Wgt.grp. Std.dev.	Estimate Method	d Setting Window						
Use Plot Coeff.		▲ <b>▼ ▶</b> ▶ <b>№</b>						
Use Plot Std.dev		• • • •						
k = VCG/D Old Methods		H Hull VCG [m]	F	Parameter			Value	Std.dev
y = 0.846 + 0 y = 0.50 Weight		(12 of 12 reference projects)	[	Depth upperm. cont. deck [m]			7.50	
VCG								
0.87								
TCG		•		Coefficient type	Coeff.v	Std.dev	Value	Std.de
		r		Regression	0.811	3 35	6.08	0.00
0.84		L		Detault	0.001	0.89	0.00	0.00
· · · .			0	Sister project	0.000	0.00	0.00	0.00
0.81	•		0 /	Adj.sister project	0.000	0.00	0.00	0.00
•	•	•	0 /	Average	0.811	3.36	6.08	0.00
0.78			١	VCG = k*D	Coeff.v	Std.dev	Value	Std.de
•			\ \	/CG[m]	0.811	3.35	6.08	
	•		Include	ID Name Type	Built Cul	bio-no, u.dk.	VCG Coefficie	ent Double 🛧
0.75			••	FA011 Bas Leader Anchor Handli	ng Tug 1997	10 557	6.81 0.8	~ ~
3000 6000 9000	12000 15000	18000 21000 LBDU	<					>
Comparison parameters	Filter	1	ProDB -					
Build Year	<u>1900-2017</u>		2017					
Project Type		Anchor Hand	ing lug					
2 Numb decks main hull [-]	0-20							
3. Numb, transv, bulkh, in main hull [-]	0-20							
4. Height dbl. btm., main hull [mm]	0-10 000							
5. Froudes number [-]	0.000-1 000 0		- 					
6. Cubic-no, u.dk. [m3]	0.000-1 000 0	6	10 868					
7. Depth upperm. cont. deck [m]	0.00-100.00		7.50					
VCG[m]			6.08					
<			>	<				>

Next, switch to VCG estimation from the Estimate menu and carry out this estimation by again selecting the "Regression" coefficient and finally again save the result.



# Step 17: Estimate the Hull LCG

	Estin	nation		- 🗆 🗙
View Graph Wgt.grp. Std.dev. Estima	te vethod Setting Window			
H LCG Use Plot Coeff.				
Use Plot Std.dev.				
k = LCG/Lpp Old Methods	H Hull LCG [m]	Parameter		Value Std.dev
y = 0.0357+0 9.93= 0.74 W/sight	(12 of 12 reference projects)	Length betw. perp. [m]		69.00
VCG				
0.585				
	_	Coefficient type	Coeff.v Std.dev	Value Std.de
100		O Subjective	0.000 0.0272	0.00 0.00
0.54	•	C Regression	0.499 3.06	34.46 0.00
			0.000 0.00	0.00 0.00
0.495	······································	Adi.sister project	0.000 0.00	0.00 0.00
	•	Average	0.498 4.28	34.35 0.00
•		LCG = k*Lpp	Coeff.v Std.dev	Value Std.de
0.45 •		LCG[m]	0.499 3.06	34.46
		Include ID Name Type	Built Length between p	erpendicals LCG Co 🔨
0.405	<b>   </b>	✓ • FA011 Bas Leader Anchor Handling Tug	1997	67.30 33.58
49 56 63 70	77 84 91 Lpp	<		>
Comparison parameters	Filter	ProDB -		
Build Year	900-2017	2017		
Project Type	hore Vesse Anchor Han	lling Tug		
1. Rake of keel [-]	0-1 000 00			
2. Froudes number [-]	<u>00-1 000 0</u>	166		
3. Numb. decks, main hull [-]	0-20			
4. Numb. propellers [-]	<u>0-10</u>			
5. LCG wheel house over shiplength [-]	00.1.000.0	10 000 F		
7 Longth betw. porp. [m]	00-450 00	69.00		
LCG[m]		34.46		

Repeat the steps you just did for the VCG estimation, only this time for the LCG.

#### Step 18: Move to Machinery Group

A Estimation											
View Graph Wgt.grp. Std.dev. Estimate	Method Setting Window										
📙 H - Weight 🗸 🖌 🎒 🗮 🕇 🖻											
_k = W/Lpp*B*D	H Hull weight [t] Parameter	Value Std.dev									

Click the toolbar button with the right arrow as marked above to move to the final weight group on the same level (Machinery) without closing the estimation Window.



#### Step 19: Set Power Range Limit to Filter Projects



In the Machinery group, click the hyperlink next to the "Main engine power" parameter and in the pop-up dialog, set 15000 as maximum power and 8000 as minimum power as range for the propulsion data to be plotted in the graph. Hit OK button to close dialog.



# Step 20: Estimate Machinery Weight

		Estim	nation						×
View Graph Wgt.grp. Std.dev.	Estimate Method	Setting Window							
🔲 M - Weight 🗸 🍝 🛔	<u>∄</u> ∠ © । ∢ ∢	▲ <b>▼</b> ▶ ▶							
		•							
• k = W/Pme/1000^0.67	м	Machinery weight [t]	F	Parameter				Value	Std.dev
y = -8.332+7.864*Ln(x) 92 = 0.70	(	7 of 19 reference projects)	1	fain engine power/1000	[MW]			iii 11.00	
Ĩ									
		_							
67.5			(	Coefficient type		Coeff.v	Std.dev	Value	Std.de
	· ·		0	Subjective		80.045	0.0232	399	0.00
66			O F	legression		64.847	2.81	323	0.00
† ·	• /		0	Default		80.045	22.40	399	0.00
l+	<u> </u>		0	iister project		0.000	0.00	0	0.00
64.5			0				0.00		0.00
			• /	lverage		65.109	3.63	325	0.00
63	•			·					- considered
			\\	Veight[t]		65.109	3.63	325	
			Include	ID Name	Туре	Built	Main engin	e power Weigl	nt Coeffic 🔺
61.5			<b>.</b>	FA011 Bas Leader	Anchor Handling	Tug 1997		13197 37	7 66
7500 9000 10500	12000 13500	15000 16500 <sup>p</sup>	<						>
Comparison parameters	Filter	1	ProDB -						
Build Year	<u>1900-2017</u>		2017						
Project Type	✓ Offshore Vesse…	Anchor Hand	ling Tug						
1. Main engine type	All								
2. Diesel engine type	All								
3. Main engine cycle [-]	0-10								
4. Numb. cylinders main-eng. [-]	0-20								
5. Numb. main engines [-]	0-10								
6. Main engine power [kW]	✓ 000-15 000		11 000						
7. Maximum speed [knot]	0.0-100.0								
8. Rot.speed main engine [rpm]	0-10000		_						
9. Tot. el.power capasity [kVA]	0.000-1 000 0								
10. Numb. el.power gen./aggr. [-]	0.000-1 000 0								
Weight[t]			325						
				<					>

Check the checkbox to the left of the hyperlink where you just set the range for Main engine power to activate this as a filter for the projects plotted in the graph. Click the "Average" radiobutton to select the coefficient to be used in the estimation and to calculate the Machinery weight. Save the result.



#### Step 21: Estimate Machinery VCG



Go to the "Estimate" menu and carry out the estimation for the VCG by selecting again the "Average" coefficient. Save the result.



# Step 22: Estimate Machinery LCG

		Estim	nation				_	×
View Graph Wgt.grp. Std.dev	Estimate I lethod	Setting Window						
Use Plot Coeff.								
Use Plot Std.dev								
k = LCG/Lpp Old Methods	M	1 Machinery LCG [m]	ŀ	Parameter			Value	Std.dev
y = 0.430*e^ 9.93= 0.74	(1	2 of 12 reference projects)	L	Length betw. perp. [m]			69.00	
weight								
			•	Coefficient type	Coeff.v	Std.dev	Value	Std.de
100			0	Subjective	0.000	0.0113	0.00	0.00
0.57				Regression	0.544	6.05	37.52	0.00
•				Default	0.000	0.60	0.00	0.00
-0.54				Adjecter project	0.000	0.00	0.00	0.00
	•	•	0	Average	0.544	6.81	37,54	0.00
					- "	<u></u>	11	
•••••			L	LCG[m]	0.544	6.81	37.54	
			Include	e ID Name Type	Built Ler	gth between	perpendicals	LCG Co 🔺
0.48		<b></b>	<.	FA011 Bas Leader Anchor Hand	ling Tug 1997		67.30	35.80
49 56 63	70 77	84 91 Lpp	<					>
Comparison parameters	Filter	I	ProDB -					
Build Year	<u>1900-2017</u>		2017					
Project Type	✓ Offshore Vesse	Anchor Hand	ling Tug					
1. Length betw. perp. [m]	0.00-450.00		69.00					
LOG[m]			37.54					
<			>	<				>

Carry out LCG estimation in similar fashion as for VCG, but in addition, after saving, close the Estimation window by clicking the Close button (door) in the toolbar.



#### Step 23: Check Results from Subgroups

				S	Standard 12.20.0	2.01 [ProDB(Tu	torial)] -				
Project Edit View Database Weight Groups	Items Checking	Std.dev. Estir	nate Help								
🗅 😅 🔐 🕅 🕅 🏛 🖬 🖉 🕼	s 🙁   🛋 🛋 🛎	k *   🗠   2	<b>e</b>								
ProDB (Tutorial)											
Weight Groups	Weight [t]	Std.dev.[%]	VCG [m]	Std.dev.[%]	LCG [m]	Std.dev.[%]	TCG				
⊿ ···· → DISP - Displacement	3 562 🚥		6.35		35.76						
R DR - Remainder displacement											
l≝⊕ <sup>v</sup> DW - Deadweight											
LW - Lightship	3 562 😁		6.35		35.76						
R - Remainder	246		4.20		29.36						
li≝⊚⊻ E - Equipment	1 069 🗽		8.45		39.04						
i≚⊚⊻ H - Hull	1 922 🗽		6.08		34.46						
M - Machinery	325 🗽		2.63		37.54						
it⊕ <sup>v</sup> T - Topside											
May Temp - Temporary											

You should now see the results of your estimation of the sublevels. However, not the value in the "Remainder" group as this automatically gets the deviation between your initial estimation and the sum of the sublevel group estimations. This is because you locked the results after the Lightship estimate.

#### Step 24: Remove the Remainder Value

Project Edit View Database Weight Gro	to the tems Checking	Std.dev. Estim	ate Help					
ProDB (Tutorial)		·				Filter:		
Weight Groups	Weight [t]	Std.dev.[%]	VCG [m]	Std.dev.[%]	LCG [m]	Std.dev.[%]	TCG [m]	Std.de
DISP - Displacement	3 562 Σ		6.35		35.76			
R DR - Remainder displacement								
0 <sup>#</sup> ⊕ <sup>v</sup> DW - Deadweight								
LW - Lightship 🛶 ا	3 562 Σ		6.35		35.76			
🤁 R - Remainder	246		4.20		29.36			
i≝⊕⊻ E - Equipment	1 069 📐		8.45		39.04			
i <sup>⊭</sup> ⊕⊻ H - Hull	1 922 🗽		6.08		34.46			
🕙 M - Machinery	325 🗽		2.63		37.54			
i≝⊕⊻ T - Topside								
Temporary								

Unlock the results and delete the Remainder value by clicking on the Remainder weight grid to get it to edit modus and delete the weight value. The results of the Lightship will after this become the sum of the subgroups.



# Step 25: Select Your Company Logo for Reports

											S	tandard	12.20.02	2.01 [ProDB(Tu	utorial)] - S
Project	Edit View Latabase	Weigh	t Groups	ltems	Checki	ng Sto	d.dev.	Estim	ate Help						
Proj	ect Info		<b>f</b> *   [	s 🖺	🛋 🛋	▲   🏠	*	<b>۰</b> ك	-						
Mai	Main Parameters			F											
Para	Parameters			Me	inht [t]	C4	d day [06	1	VCG [m]	Chr	day [%]	100	[m]	Std day [96]	TCG [m
Met	hod Values		3 316			Suldev.[70]			vca [m]	50	510.0ev.[%]		26.24	sta.dev.[76]	ica (iii
Drav	wing	•				2				6.51		30.24			
Con	nment	•													
Cod	le Definition	3							Options					? ×	
Cod	le Envelopes				- E						_				
Cod	le Mapping				1	Genera	l Decim	nals Q	uantity Datab	ase Log	Report	Iem Est	timation   \	Works 1	
Cod	le Summary				1						_				
Con	npare					Line Di	istance:		300						
Wei	ght Distribution						5.10			_					
Gyra	adius					Heade	er Font Si	ze:	70% 🔻	•					
Exec	cutive Summary					Report	t Font Siz	ze:	50% >	•					
Wei	Weight Matrix				-										
Trer	Trend Lines												<b>.</b> .		
Loa	d Conditions					Repor	t Logo:		C:\Program F	iles\ShipWe	eight 10\comp	bany.bmp		J	
Mod	Module Wqt. Distribution					Print S	SW logo:		✓						
Opt	ions	J				Use Ph	hase Cod	le:			$\sim$				
✓ Too	lbar														
✓ Stat	us Bar														
											_				
												014			
						Imp	port					OK	J_'	Cancel	

Go to the View menu and open the Options window. Select the "Report" tabsheet and click the browse button [...] to select a company logo file. Hit the OK button.



#### Step 26: Print a Result Report



Go to the Project menu, select submenu Reports and select submenu item for report number 9 – "Methods and Coefficients" to produce a report of the estimation you have just finished.



#### Step 27: Print a Detailed Report



To produce more background information about a specific estimation, select the weight group in the main window, open the estimation window from the toolbar and click the "Print" button. This will produce a more detailed report for the estimation of a particular weight group.