

Report of Awesome-qr.js Coupling Design Problems (Translated)

Threshold: CINT FEW=3, only detected(either manually or by the heuristic) classes are listed.

Class>Function	Manual / Heuristic Detection Result	DC Intensity	FE Intensity	Manual / Heuristic Detection of Coupling Targets	Author's comment	Developer's comment
QRPolynomial>mod	Affected/ Affected	0.4	0	QRMATH/QRMATH, input parameter e	This method might be moved into QRMATH.	Yes, coupling problem exists. QRPolynomial is a class related to ErrorCorrectionLevel encoding in QR Code Standard. After the initialization of QRMATH that produces LOG_TABLE and EXP_TABLE, QRPolynomial is mainly used as a constant list by QRMATH. As QRPolynomial is only used by QRMATH, most functionalities should be moved into QRMATH.
QRPolynomial>multiply	Affected/ Affected	0.5	0	QRMATH/QRMATH, input parameter e	This method might be moved into QRMATH.	Same as above.
Drawing>draw	Affected/ Affected	0.07	0	QRCodeModel / QRUtil, QRCodeModel	This is an oversized blob class, actually FE is not the most urgent problem.	This function is very hard to comprehend and maintain. Maybe it's better to split the process into multiple steps, and make options as input parameters.
QRCodeModel>make	Affected/ Affected	0.33	0.17(QRRSBlock)	QRUtil / QRRSBlock, QRUtil	Some business logics should be moved into QRUtil.	Dead code are also found in the implementation, we could call makeImpl straightly and remove this method.
AwesomeQRCode>makeCode	Affected/ Affected	0.4	1(Drawing, QRCodeModel)	Drawing, QRCodeModel	Through Object Type Inference we managed to infer _oDrawing is an instance of Drawing Class.	AwsomeQRCode encapsulates Drawing and QRCodeModel to hide some details of implementation and to avoid unnecessary modifications.
QRUtil>getLostPoint	Affected/ NOT Affected	NA	NA	QRCodeModel	QRUtil is not considered as a class by the heuristic due to the lack of constructor.	This function tests the mask patterns at the selected fault tolerance level and selects the best (the minimum required change) test result and uses it to determine the QR code drawing matrix.

Report of Awesome-qr.js Cohesion Design Problems (Translated)

All classes are listed.

Class	Manual / Heuristic Detection Result	Structural Intensity	Textual Intensity	LOC	Author's comment	Developer's comment
QRCodeModel	Affected/ Affected	0.576	0.51	533	Oversized.	It's a wrapper alike class consisting of operations of encoding QR code , resolving metadata and other functions. It also stores metadata of current QRCode.
Drawing	Affected/ Affected	0.68	0.74	327	Oversized.	Draw should be split into multiple funtions.
QRPolynomial	Affected/ Affected	0	0.29	44	This class has a characteristic of Utility Class.	Cohesion problem will be resolved if merged with QRMATH.
QRBitBuffer	Affected/ Affected	0.26	0.21	28	This class contains many members, and they are rarely accessed, but problem is not serious.	It is used to store the original QR code data stream before the fault-tolerant pre-processing, so it is called in early stage of QR code generation.
QR8bitByte	Affected/ Affected	1	0	41	QR8bitByte contains multiple attributes that are not accessed by any function members, which resulted in low cohesion, but the name patterns of function members are closely related to the business logic.	Encodes the input data into an array of 8-bytes per element, the constructor completes the initialization stream.
AwesomeQRCode	Affected/ Affected	0	0.46	55	Only detected by the textual approach revealing that it is related to multiple conceptions which is commonly seen in giant initialization functions.	This is a wrapper combining the encoding workflow into a single function.
QRRSBlock	NOT Affected / NOT Affected	0	0	197	The class is a lightweight one but contains a literally defined array which is huge, it shouldn't be considered as a blob class.	The giant array is related to the Reed-Solomon encode.
QRUtil	Affected/NOT Affected	NA	NA	213	Not detected as a class.	Used to store mask patterns and provide the penalty for choosing the best pattern. An array of approximate constants is exposed by the function for the external access through typeNumber.
QRMATH	NOT Affected / NOT Affected	NA	NA	18	Not detected as a class.	QRPolynomial and QRMATH should be merged.