# Blockchain

Compute blockchains containing text, images, audio and videos!

- □□, □□, □□, ⬠
- □
- Example: Bardcodes
- Example: NASA Ocean Color (MODIS)
- Example: Photo ID
- Example Photo Id + multiple images and barcodes
- Example Polymer Simulation

# □□, □□, □□, ⬠

A very simple and a very short but a very powerful program:

```
□□;

show (□□□);
show (□□□);

show □□also □□;

save as 2keys-show-test;
```

Output

https://www.wolframcloud.com/obj/ccn2/AI/freeform/blockchain/publishedtest/certs_free_2keys-show-test_0fcc0f4d

## Cloud Object Browser

https://www.wolframcloud.com/obj/ccn2/AI/freeform/blockchain/publishedtest/certs_free_2keys-show-test

# □

```
□□;

□□ (
□□"metadata1"->"I am metadata1"
□□"metadata2"->"I am metadata2"
□ "I am content1"
□ "I am content2"
);

pdfs = "□□/pdf";

show pdfs;

save as certificate0-test;
```

Output:

https://www.wolframcloud.com/obj/ccn2/AI/freeform/blockchain/publishedtest/certs_free_certificate0-test_5f956cf5

## Cloud Object Browser

https://www.wolframcloud.com/obj/ccn2/AI/freeform/blockchain/publishedtest/certs_free_certificate0-test

## PDF Certificates

https://www.wolframcloud.com/obj/ccn2/freeform/ff/blockchain/bloxberg2/cert_pdf/certs_free_certificate0-test_1.pdf

https://www.wolframcloud.com/obj/ccn2/freeform/ff/blockchain/bloxberg2/cert_pdf/certs_free_certificate0-test_2.pdf

# Example: Bardcodes

Any image/photo entering the Free Form language computational container is immediately processed for:

- Any faces? if yes, highlight and cutout the facial regions and compute them (their properties).
- Any barcodes or qr-codes? if yes, highlight the barcode regions and read them.
- Any texts? if yes, OCR the image.
- Add the necessary post-processing e.g. image annotations
- Finally collect at the resulting metadata tags □□ and contents ⚲ (to be hashed) and URL export as String

**Case 1**: Single image multiple barcodes only




```
//symbol to process barcodes and qrcodes;
□□□□□□□:□□□□□□

□□:
```

```
//add name and other information;
□□ (
□□"type"->"image segmentation"
□□"info"->"qr code detection in photo"
□□"publisher"->"CDN: compdatanotes.com"
□□"©"->"CC-BY-NC-ND 4.0"
);

show "□□□□□□□/index";

show "□□□□□□□/bartexts";

save as qr1;
```

Output

"□□□□□□□□□□□/index"




"□□□□□□□□□□□/bartexts"

{"065656915641", "065515000037", "9771468413022", "037000377085", "8435039118747"}

## Blockchain Certificate

"□ /certificate" (trimmed text)

https://www.wolframcloud.com/obj/ccn2/freeform/ff/blockchain/bloxberg2/cert_json/ff_free_blox_qr.json

There are currently 4 default mandatory items inside the hash list or the CRID and you can obtain the barcode related ones

Scanned bars as above

https://www.wolframcloud.com/obj/ccn2/freeform/ff/images/ff_free_blox_qr_bars.png

JSON containing if any other OCR texts computed from the image

https://www.wolframcloud.com/obj/ccn2/freeform/ff/images/ff_free_blox_qr_imagetext.json

See the bounding box JSON below addresses as "_boxes"

https://www.wolframcloud.com/obj/ccn2/freeform/ff/images/ff_free_blox_qr_boxes.json

The String values for the barcodes and the qr codes

https://www.wolframcloud.com/obj/ccn2/freeform/ff/images/ff_free_blox_qr_barcodebox.json

"□□□□□□□□□□□□/⚲"

⚲"https://www.wolframcloud.com/obj/ccn2/freeform/ff/images/certs_free_qr1_bars.png⊕https://www.wolframcloud.com/obj/ccn2/freeform/ff/images/certs_free_qr1_imagetext.json⊕https://www.wolframcloud.com/obj/ccn2/freeform/ff/images/certs_free_qr1_boxes.json⊕https://www.wolframcloud.com/obj/ccn2/freeform/ff/images/certs_free_qr1_barcodebox.json⊕https://www.wolframcloud.com/obj/ccn2/freeform/ff/images/certs_free_qr1_linehighlights.png⊕https://www.wolframcloud.com/obj/ccn2/freeform/ff/images/certs_free_qr1_lineboxes.json"

## qr-codes or bar-codes bounding box scanning area

Any geometrical information pertinent to full understanding and computational access for a region of an image or a recognized object is computed and place in appropriate JSON structures.

## Cloud Object Browser

https://www.wolframcloud.com/obj/ccn2/AI/freeform/blockchain/published/certs_free_qr1

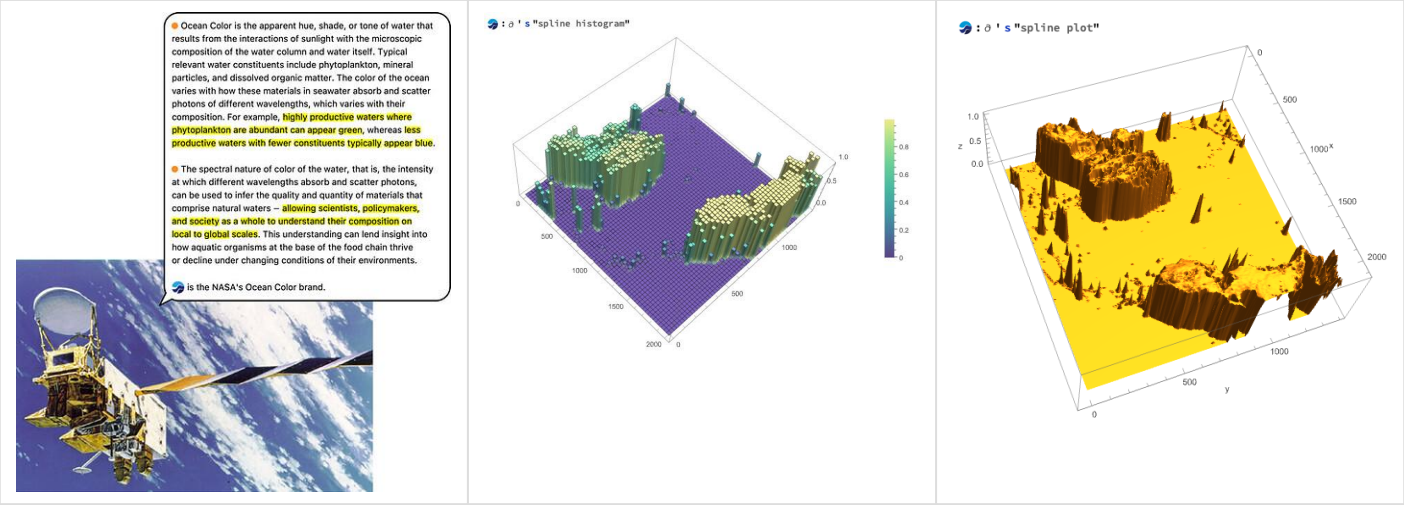
# PDF Certificate

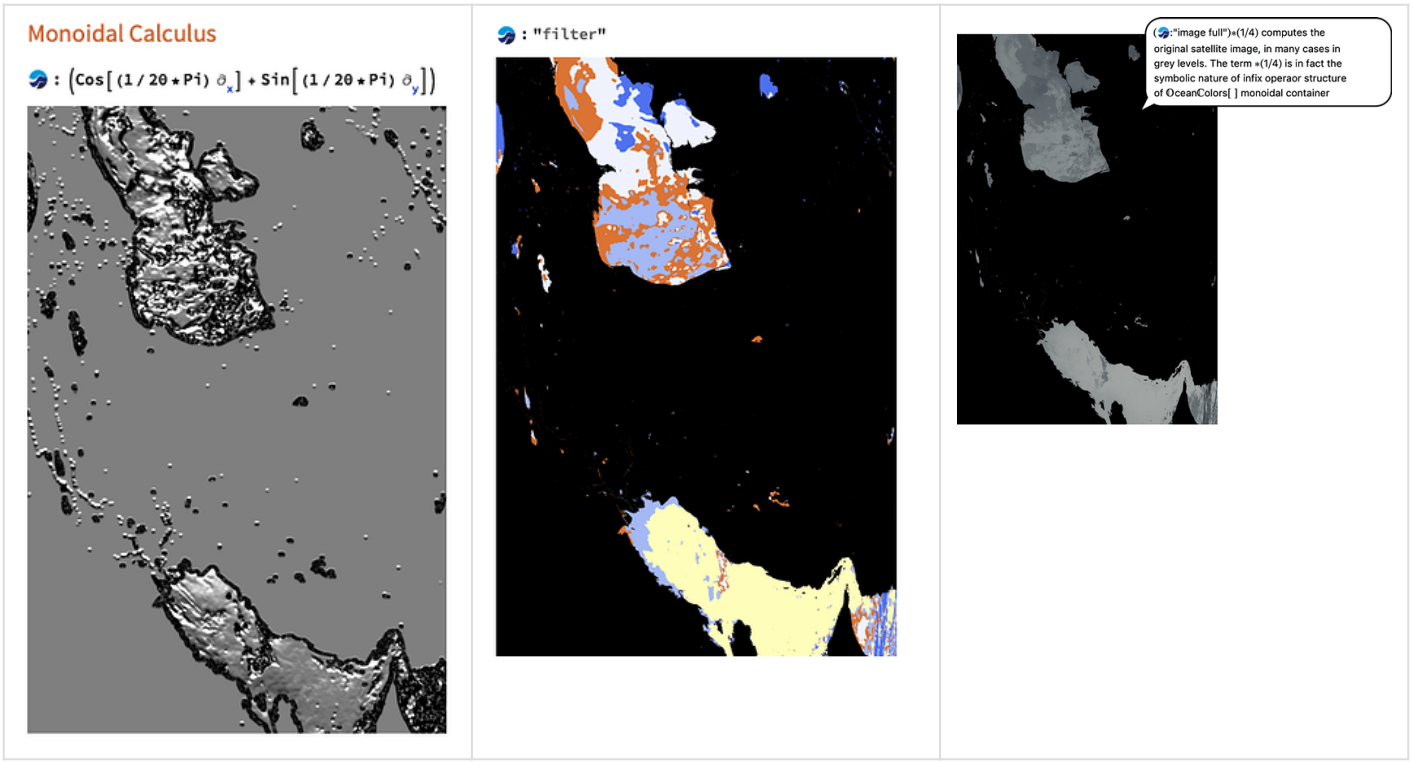
https://www.wolframcloud.com/obj/ccn2/freeform/ff/blockchain/bloxberg2/cert_pdf/certs_free_qr1_1.pdf

# Example: NASA Ocean Color (MODIS)

## Ocean Colors?

- The MODIS instrument is operating on both the Terra and Aqua spacecraft.  It has a viewing swath width of 2,330 km and views the entire surface of the Earth every one to two days. Its detectors measure 36 spectral bands between 0.405 and 14.385 µm, and it acquires data at three spatial resolutions -- 250m, 500m, and 1,000m.
- Along with all the data from other instruments on board the Terra spacecraft and Aqua Spacecraft, MODIS data are transferred to ground stations in White Sands, New Mexico, via the Tracking and Data Relay Satellite System (TDRSS). The data are then sent to the EOS Data and Operations System (EDOS) at the Goddard Space Flight Center. The Level 1A, Level 1B, geolocation and cloud mask products and the Higher-level MODIS land and atmosphere products are produced by the MODIS Adaptive Processing System (MODAPS), and then are parceled out among three DAACs for distribution. Ocean color products are produced by the Ocean Color Data Processing System (OCDPS) and distributed to the science and applications community.
- https://oceandata.sci.gsfc.nasa.gov/
- https://oceandata.sci.gsfc.nasa.gov/gallery/






## Free Form Script

Data from several fully coded papers:

https://www.researchgate.net/publication/400562876_OCEAN_COLOR_Calculus_NASA_MODIS-Aqua_Satellite_Image_Data

DOI:10.13140/RG.2.2.29744.21764

https://www.researchgate.net/publication/400895427_OCEAN_COLOR_Calculus_Image_Integration_NASA_MODIS-Aqua_Satellite_Part_1-a90

DOI:10.13140/RG.2.2.33099.66082

https://www.researchgate.net/publication/400895288_OCEAN_COLOR_Calculus_Image_Integration_NASA_MODIS-Aqua_Satellite_Part_2-a90

DOI:10.13140/RG.2.2.16322.44482


```
//© 2012-Present CCN Studios Creative Commons Attribution- NonCommercial- ShareAlike 4.0 International Public License;
```

```
□□;

//add name and other information;
□□ (
□□"type"->"image processing"
□□"info"->"NASA Ocean Color"
□□"satellite"->"MODIS"
□□ "publisher"->"CDN: compdatanotes.com"
□□"©"->"CC-BY-NC-ND 4.0"
);

pdfs = "□□/pdf";

show pdfs;

save as ocean-colors-certs;
```

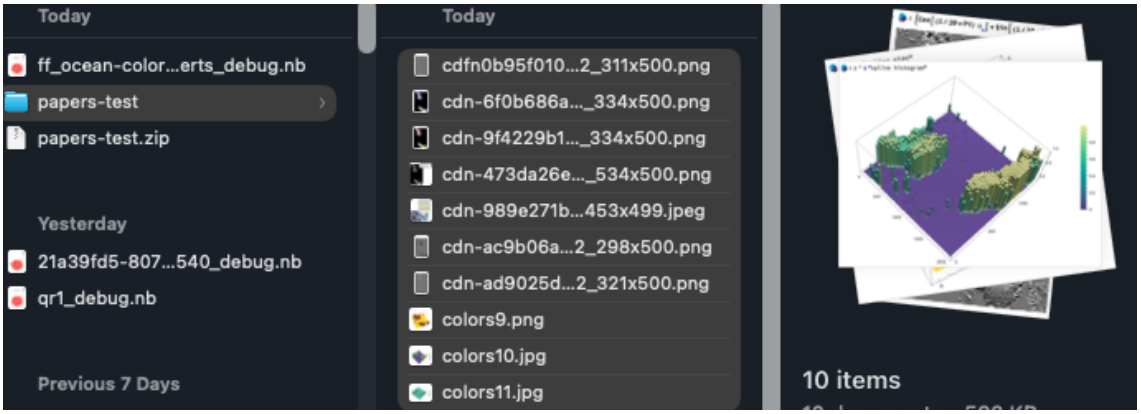
Output:

"pdfs" ⟶
"({"https://www.wolframcloud.com/obj/ccn2/freeform/ff/blockchain/bloxberg2/cert_pdf/certs_free_ocean-colors-certs_1.pdf",
"https://www.wolframcloud.com/obj/ccn2/freeform/ff/blockchain/bloxberg2/cert_pdf/certs_free_ocean-colors-certs_2.pdf",
"https://www.wolframcloud.com/obj/ccn2/freeform/ff/blockchain/bloxberg2/cert_pdf/certs_free_ocean-colors-certs_3.pdf",
"https://www.wolframcloud.com/obj/ccn2/freeform/ff/blockchain/bloxberg2/cert_pdf/certs_free_ocean-colors-certs_4.pdf",
"https://www.wolframcloud.com/obj/ccn2/freeform/ff/blockchain/bloxberg2/cert_pdf/certs_free_ocean-colors-certs_5.pdf",
"https://www.wolframcloud.com/obj/ccn2/freeform/ff/blockchain/bloxberg2/cert_pdf/certs_free_ocean-colors-certs_6.pdf",
"https://www.wolframcloud.com/obj/ccn2/freeform/ff/blockchain/bloxberg2/cert_pdf/certs_free_ocean-colors-certs_7.pdf",
"https://www.wolframcloud.com/obj/ccn2/freeform/ff/blockchain/bloxberg2/cert_pdf/certs_free_ocean-colors-certs_8.pdf",
"https://www.wolframcloud.com/obj/ccn2/freeform/ff/blockchain/bloxberg2/cert_pdf/certs_free_ocean-colors-certs_9.pdf",
"https://www.wolframcloud.com/obj/ccn2/freeform/ff/blockchain/bloxberg2/cert_pdf/certs_free_ocean-colors-certs_10.pdf",
"https://www.wolframcloud.com/obj/ccn2/freeform/ff/blockchain/bloxberg2/cert_pdf/certs_free_ocean-colors-certs_11.pdf",
"https://www.wolframcloud.com/obj/ccn2/freeform/ff/blockchain/bloxberg2/cert_pdf/certs_free_ocea

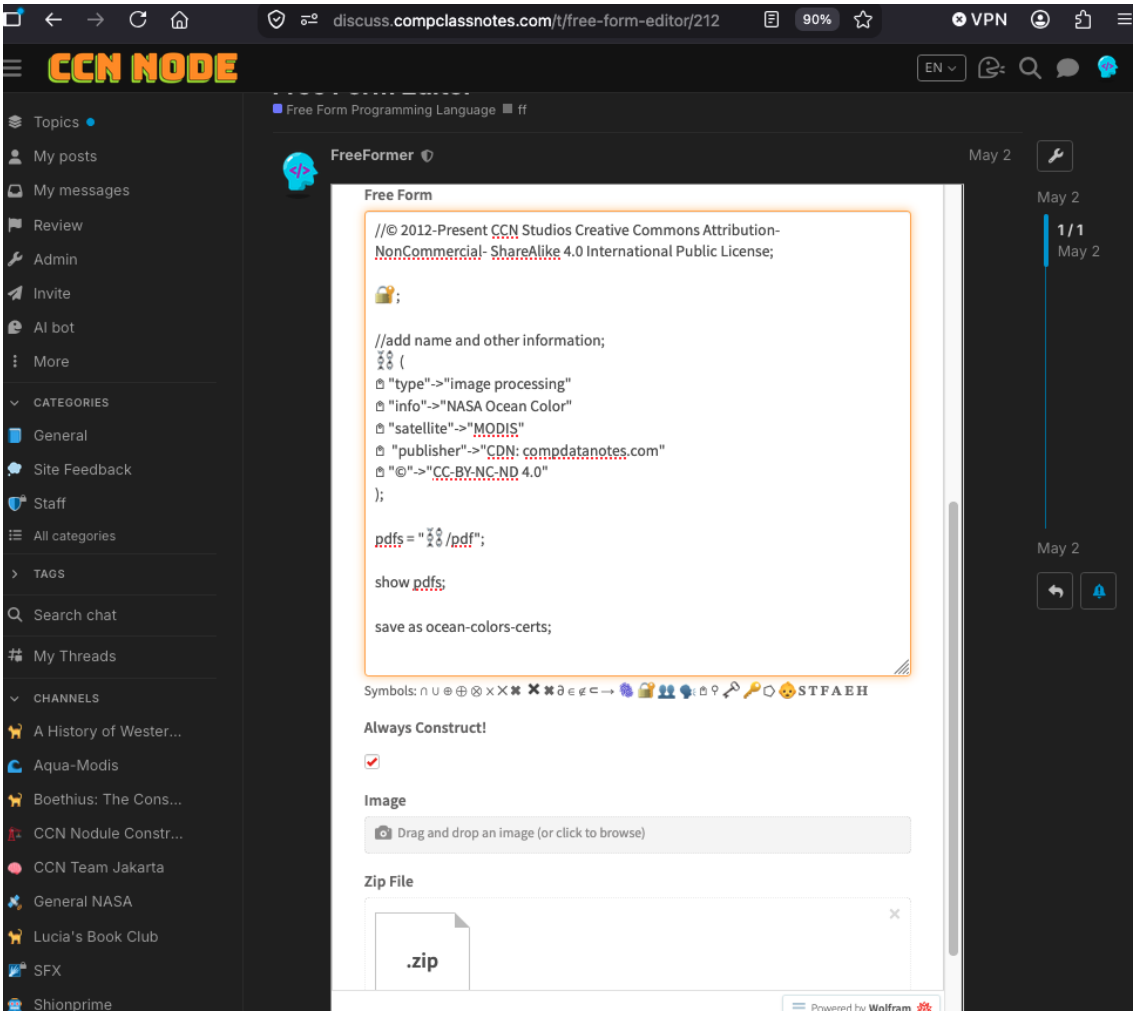
n-colors-certs_12.pdf"}) "

## Batch Input: Zipped Directory

- Create a directory
- Copy and paste all files for **Contents** into a blockchain
- Zip the directory




- Input the zip file into **Zip File** labeled input field



## Cloud Object Browser

https://www.wolframcloud.com/obj/ccn2/AI/freeform/blockchain/publishedtest/certs_free_ocean-colors-certs

## PDF Certificates

https://www.wolframcloud.com/obj/ccn2/freeform/ff/blockchain/bloxberg2/cert_pdf/certs_free_ocean-colors-certs_1.pdf

https://www.wolframcloud.com/obj/ccn2/freeform/ff/blockchain/bloxberg2/cert_pdf/certs_free_ocean-colors-certs_2.pdf

https://www.wolframcloud.com/obj/ccn2/freeform/ff/blockchain/bloxberg2/cert_pdf/certs_free_ocean-colors-certs_3.pdf

https://www.wolframcloud.com/obj/ccn2/freeform/ff/blockchain/bloxberg2/cert_pdf/certs_free_ocean-colors-certs_4.pdf

https://www.wolframcloud.com/obj/ccn2/freeform/ff/blockchain/bloxberg2/cert_pdf/certs_free_ocean-colors-certs_5.pdf

https://www.wolframcloud.com/obj/ccn2/freeform/ff/blockchain/bloxberg2/cert_pdf/certs_free_ocean-colors-certs_6.pdf

https://www.wolframcloud.com/obj/ccn2/freeform/ff/blockchain/bloxberg2/cert_pdf/certs_free_ocean-colors-certs_7.pdf

https://www.wolframcloud.com/obj/ccn2/freeform/ff/blockchain/bloxberg2/cert_pdf/certs_free_ocean-colors-certs_8.pdf

https://www.wolframcloud.com/obj/ccn2/freeform/ff/blockchain/bloxberg2/cert_pdf/certs_free_ocean-colors-certs_9.pdf

https://www.wolframcloud.com/obj/ccn2/freeform/ff/blockchain/bloxberg2/cert_pdf/certs_free_ocean-colors-certs_10.pdf

https://www.wolframcloud.com/obj/ccn2/freeform/ff/blockchain/bloxberg2/cert_pdf/certs_free_ocean-colors-certs_11.pdf

https://www.wolframcloud.com/obj/ccn2/freeform/ff/blockchain/bloxberg2/cert_pdf/certs_free_ocean-colors-certs_12.pdf

# Example: Photo ID

```
□□;

□□;

//add name and other information;
□□(
□□"first name"->"dara"
□□"last name"->"shayda"
);

show "□□/highlight";

save as photo_id;
```

# Free Form Editor

Free Form Programming Language ff

Free Form

```
👶;

🔐;

//add name and other information;
⛓(
🔏"first name"->"dara"
🔏"last name"->"shayda"
);

show "👶/highlight";
```

Symbols: ∩ ∪ ⊕ ⊕ ⊗ × ✕ ✖ ✖ ✖ ∂ ∈ ∉ ⊂ → 🍇 🔐 🗝 🔑 ⬡ 👶 S T F A E H

Image



Zip File

Drag and drop a file (or click to browse)

Construct!

Powered by Wolfram

# Example Photo Id + multiple images and barcodes

- USA, the state of Virginia (proposed?) Personal Identity card
- With qrcodes, barcodes and multiple images and text.
- Symbol □□ does all the facial computing (neural nets), barcodes, qrcodes and image text
- This will empower a universal blockchained or bloxberged Digital object that could and should enable a new de-centralized identification card system.

```
□□;

□□;

//□□fills in numerous □content + □□etadata into the blockchain;
□□;

show "□□index";

save as photo_id;
```

"□□/index"



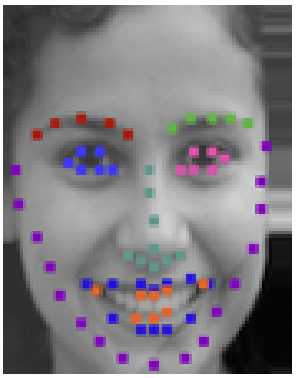




"□□/barsindex"




"□□/highlight"



"□□/text"

{

"image_text":"Vi soe VA, USA FEDERAL *\nLYQIM1A IDENTIFICATION CARD

_#n* a\n716700487 e\nTESSIER 8 Gender: Female, Orientation: Straight,

Age: 35,\nBELLA Fi Race: White\/ Non-Hispanic, Votes: Democrat,\nAd

srw aD *B88\"795-a202 5 Job: Industrial Machinery Repair Worker,

Security\n74 IN RD: 5 5 â??Answers: {The Truman Show, Omaha, White},\n

Dato of birt ry Marital status: married, Salutation: Mrs.\nOeio4rt988

A\na ED Height: 5â?? 6â?□ \nF BRO Weight: 136 ssn: Q\nNONE\n\ntek

items tebe IMT |"

}

"□□/bartexts"

{

"@<LF><FS><CR>ANSI

6360050101DL00300203DLDAQ3265188<LF>DAALOTT,ERIC,B,<LF>DAG763 TEST

STREET<LF>DAINEW YORK CITY<LF>DAJSC<LF>DAK10005  <LF>DARD  <LF>DAS

    <LF>DAT    <LF>DAU601<LF>DAW170<LF>DAYBRO  <LF>DAZBRO

<LF>DBA20241004<LF>DBB19911004<LF>DBC1<LF>DBD20140101<LF>DBG2<LF>DBH1

}

## Color Keys

Blockchain by Bloxberg 2.0

CCN cloud systems

## Image Processing + Bloxberg 2.0 Blockchain Digitals

{

"□□/face", "□□/face1", "□□/highlight", "□□/faces", "□□/index", "□□/text",

"□□/facials", "□□/boxes", "□□/bartexts", "□□/barsindex", "□□/⚲", "□□/□□", "□□

processed", "(□□)", "□□/type", "□□/curve", "□□/compressed", "(□□)",

"(⬡□□)", "⬡□□/type", "□□/type", "(□□)", "(⬡□□)", "⬡□□/type", "□□/type",

"□ /bloxberg/contexts", "□ /bloxberg/context1/@context",

"□ /bloxberg/context1/id", "□ /bloxberg/context1/type",

"□ /bloxberg/context1/issuer", "□ /bloxberg/context1/issuancedate",

"□ /bloxberg/context1/credentialsubject", "□ /bloxberg/context1/crid",

"□ /bloxberg/context1/cridtype", "□ /bloxberg/context1/metadatajson",

"□ /bloxberg/context1/proof", "□ /bloxberg/context2/@context",

"□ /bloxberg/context2/id", "□ /bloxberg/context2/type",

"□ /bloxberg/context2/issuer", "□ /bloxberg/context2/issuancedate",

"□ /bloxberg/context2/credentialsubject", "□ /bloxberg/context2/crid",

"□ /bloxberg/context2/cridtype", "□ /bloxberg/context2/metadatajson",

"□ /bloxberg/context2/proof", "□ /bloxberg/context3/@context",

"□ /bloxberg/context3/id", "□ /bloxberg/context3/type",

"□ /bloxberg/context3/issuer", "□ /bloxberg/context3/issuancedate",

"□ /bloxberg/context3/credentialsubject", "□ /bloxberg/context3/crid",

"□ /bloxberg/context3/cridtype", "□ /bloxberg/context3/metadatajson",

"□ /bloxberg/context3/proof", "□ /bloxberg/context4/@context",

"□ /bloxberg/context4/id", "□ /bloxberg/context4/type",

"□ /bloxberg/context4/issuer", "□ /bloxberg/context4/issuancedate",

"□ /bloxberg/context4/credentialsubject", "□ /bloxberg/context4/crid",

"□ /bloxberg/context4/cridtype", "□ /bloxberg/context4/metadatajson",

"□ /bloxberg/context4/proof", "□ /bloxberg/context5/@context",

"□ /bloxberg/context5/id", "□ /bloxberg/context5/type",

"□ /bloxberg/context5/issuer", "□ /bloxberg/context5/issuancedate",

"□ /bloxberg/context5/credentialsubject", "□ /bloxberg/context5/crid",

"□ /bloxberg/context5/cridtype", "□ /bloxberg/context5/metadatajson",

"□ /bloxberg/context5/proof", "□ /bloxberg/context6/@context",

"□ /bloxberg/context6/id", "□ /bloxberg/context6/type",

"□ /bloxberg/context6/issuer", "□ /bloxberg/context6/issuancedate",

"□ /bloxberg/context6/credentialsubject", "□ /bloxberg/context6/crid",

"□ /bloxberg/context6/cridtype", "□ /bloxberg/context6/metadatajson",

"□ /bloxberg/context6/proof", "□ /bloxberg/context7/@context",

"□ /bloxberg/context7/id", "□ /bloxberg/context7/type",

"□ /bloxberg/context7/issuer", "□ /bloxberg/context7/issuancedate",

"□ /bloxberg/context7/credentialsubject", "□ /bloxberg/context7/crid",

"□ /bloxberg/context7/cridtype", "□ /bloxberg/context7/metadatajson",

"□ /bloxberg/context7/proof", "□ /contents", "□ /hashlist", "□ /key_eth",

"□ /value", "□ /pdf", "□ /fullcredentialobject",

"□ /certificate", "□ /metadata",

}

"□□/♀"

"♀\"https://www.wolframcloud.com/obj/ccn2/freeform/ff/images/ff_free_blox_id_face.png\"♀\"\
https://www.wolframcloud.com/obj/ccn2/freeform/ff/images/ff_free_blox_\ id_facehighlight.png\"♀\"\
https://www.wolframcloud.com/obj/ccn2/freeform/ff/images/ff_free_blox_id_facehighlights.png\"♀\"\
https://www.wolframcloud.com/obj/ccn2/freeform/ff/images/ff_free_blox_id_index.png\"♀\"\
https://www.wolframcloud.com/obj/ccn2/freeform/ff/images/ff_free_blox_id_imagetext.json\"♀\"\
https://www.wolframcloud.com/obj/ccn2/freeform/ff/images/ff_free_blox_id_facialpoints.json\"♀\"\
https://www.wolframcloud.com/obj/ccn2/freeform/ff/images/ff_free_blox_id_barcodebox.json\""

"□□/□□"

"□□\"group\"->\"ff\"□□\"user\"->\"free\"□□\"ffname\"->\"blox_\ id\"□□\"publisher\"->\"CCN\"□□
\"license\"->\"CC-BY-NC-ND 4.0\""

## Full Credential Object

"□ /fullcredentialobject"

"([{\"@context\":[\"https://www.w3.org/2018/credentials/v1\",\"https://w

3id.org/bloxberg/schema/research_object_certificate_

v1\"],\"id\":\"https://bloxberg.org\",\"type\":[\"VerifiableCredential

\",\"BloxbergCredential\"],\"issuer\":\"https://raw.githubusercontent.c

om/bloxberg-org/issuer_json_

l2/master/issuer.json\",\"issuanceDate\":\"2026-06-02T02:59:59.

448151+00:00\",\"credentialSubject\":{\"id\":\"https://sepolia.arbisca

n.io/address/0xAF3aD7B80e90C0Ca651a8e673E193eCC690BADA8\",\"issuingOrg

\":{\"id\":\"https://bloxberg.org\"}},\"crid\":\"9d05f7aa5009599ded40f

f901de8fbce8bedb00004c0e6ad77fd128c7fac6806\",\"cridType\":\"sha2-256\",\"m

etadataJson\":\"{\\\"group\\\":\\\"ff\\\", \\\"user\\\":\\\"free\\\",

\\\"ffname\\\":\\\"blox_id\\\", \\\"publisher\\\":\\\"CCN\\\",

\\\"license\\\":\\\"CC-BY-NC-ND

4.0\\\"}\",\"proof\":{\"type\":\"MerkleProof2019\",\"created\":\"2026-0

6-02T02:59:59.

947487\",\"proofValue\":\"zLBHrm1GqmftAu35gTndQtHSErc2pdrx2dQ69dF9Fqvj

vqCY71iNnFEaW1kSw5rVcT6XXiWJHY7uUQyKhjPsg32KpHfyMR2GZZkEeY7YvcRRQSAjkK

sduAX2KXxWnFFBWFbn27m7m9ritdwzTzbbGFPRNfAqSeGhDKxTqLp4wYgqfAWAuFxDnG3n

hyUDCAP1c9BohuH45o3f64tEnAH3LQmJkzGKKixRqz9TtypnELSJwzeMPTWZNPTihHhL2P

A9N9YvMt3RtbJGaWzRAwebi7Tf2FwujSNmCX7Cygb13 ...

...

@context\":[\"https://www.w3.org/2018/creden

tials/v1\",\"https://w3id.org/bloxberg/schema/research_object_

certificate_

v1\"],\"id\":\"https://bloxberg.org\",\"type\":[\"VerifiableCredential

\",\"BloxbergCredential\"],\"issuer\":\"https://raw.githubusercontent.c

om/bloxberg-org/issuer_json_

l2/master/issuer.json\",\"issuanceDate\":\"2026-06-02T02:59:59.

448151+00:00\",\"credentialSubject\":{\"id\":\"https://sepolia.arbisca

n.io/address/0xAF3aD7B80e90C0Ca651a8e673E193eCC690BADA8\",\"issuingOrg

\":{\"id\":\"https://bloxberg.org\"}},\"crid\":\"5b57331ee65751d0024a3

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951710\",\"proofValue\":\"zLBHrm1GqUpCCwm ....

...

"□ /pdf"

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\"https://www.wolframcloud.com/obj/ccn2/freeform/ff/blockchain/bloxberg2/cert_pdf/ff_free_blox_id_2.pdf\",

\"https://www.wolframcloud.com/obj/ccn2/freeform/ff/blockchain/bloxber2/cert_pdf/ff_free_blox_id_3.pdf\",

\"https://www.wolframcloud.com/obj/ccn2/freeform/ff/blockchain/bloxberg2/cert_pdf/ff_free_blox_id_4.pdf\",

\"https://www.wolframcloud.com/obj/ccn2/freeform/ff/blockchain/bloxberg2/cert_pdf/ff_free_blox_id_5.pdf\",

\"https://www.wolframcloud.com/obj/ccn2/freeform/ff/blockchain/bloxberg2/cert_pdf/ff_free_blox_id_6.pdf\",

\"https://www.wolframcloud.com/obj/ccn2/freeform/ff/blockchain/bloxberg2/cert_pdf/ff_free_blox_id_7.pdf\"})"

**Certificate 1**




**Certificate 7**



# Example Polymer Simulation

```
//© 2012-Present CCN Studios Creative Commons Attribution -
NonCommercial- ShareAlike 4.0 International Public License;

□□;

□□ (
□□"platform"->"Nodule Construct 2026.8b1 (Aug 4th)"
□□"app"->"certs/free/polymer4"
□□"unity"->"6000.4.9f1"
□□"license"->"CC-BY-NC-ND 4.0"
);

//transforms C# classes into Cloud Objects for remote Unity runtime compilation;
references' type is reference;
references' list = { 'Polymer2, 'SpinLocal3, 'Platform3,
'MeshSpawner3,'MeshSticker3, 'SpawnPlayer3, 'SimpleWalkable3};

classes' type is class;

classes' list = {'Constructor3};



save as polymer5;
```

## Nodule Construct

Enter into the input box on top left:

certs/free/polymer5 + orb

https://itch.io/embed-upload/18667140?color=333333

## Blockchain Contents

https://www.wolframcloud.com/obj/ccn2/AI/freeform/blockchain/publishedtest/certs_free_polymer5_fe0baa4b

## Cloud Object Browser

https://www.wolframcloud.com/obj/ccn2/AI/freeform/blockchain/publishedtest/certs_free_polymer5

## PDF Certificates

https://www.wolframcloud.com/obj/ccn2/freeform/ff/blockchain/bloxberg2/cert_pdf/certs_free_polymer5_1.pdf

https://www.wolframcloud.com/obj/ccn2/freeform/ff/blockchain/bloxberg2/cert_pdf/certs_free_polymer5_2.pdf

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