



# Introduction to Blockchain

*Assignment 4*

Adan Abbas  
18i-0401 (Section A)  
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# Initializing the blockchain and deploying smart contract

Ganache

ACCOUNTS

BLOCKS

TRANSACTIONS

CONTRACTS

EVENTS

LOGS

SEARCH FOR BLOCK NUMBERS OR TX HASHES

CURRENT BLOCK0

GAS PRICE20000000000

GAS LIMIT6721975

HARDFORKMUIRGLACIER

NETWORK ID5777

RPC SERVERHTTP://127.0.0.1:7545

MINING STATUSAUTOMINING

WORKSPACEASSIGNMENT-4-FINAL

SWITCH

MNEMONIC

siren sadness same close ladder exile all rather alter question quantum focus

HD PATH

m/44'/60'/0'/0/account\_index

ADDRESS

0xFe308013aC0577817b41Ec1678102f1B7eF3B1fE

BALANCE

100.00 ETH

TX COUNT

0

INDEX

0

ADDRESS

0xa32224a049F2aA8C235163aad22DC942DF802869

BALANCE

100.00 ETH

TX COUNT

0

INDEX

1

ADDRESS

0x8311D566A61377385E414e401CEC161169a29e89

BALANCE

100.00 ETH

TX COUNT

0

INDEX

2

ADDRESS

0x13300A77173D9FF63Bf9B1f6a09d92805a572652

BALANCE

100.00 ETH

TX COUNT

0

INDEX

3

ADDRESS

0x523bafa7F2DED8fCe2A74d57EA1B629BE0D02b65

BALANCE

100.00 ETH

TX COUNT

0

INDEX

4

ADDRESS

0xF7ef75ef96505536B044C5Ff3A9fC82e06a5fb53

BALANCE

100.00 ETH

TX COUNT

0

INDEX

5

Initial balance of all the accounts

```

Deploying 'EscrowPayments'
-----
> transaction hash: 0x0fa542c6819fb080c3a96b4304d4661467ded252d63316e4d463bc3a86a70a8c
> Blocks: 0 Seconds: 0
> contract address: 0xB7a77a0cfe69eD1C9f5b3d25b515f25408E5cAca
> block number: 2
> block timestamp: 1639490372
> account: 0xFE308013aC0577817b41Ec1678102f1B7eF3B1fE
> balance: 99.96061498
> gas used: 1720397 (0x1a404d)
> gas price: 20 gwei
> value sent: 0 ETH
> total cost: 0.03440794 ETH

> Saving migration to chain.
> Saving artifacts
-----
> Total cost: 0.03938502 ETH

Summary
=====
> Total deployments: 2
> Final cost: 0.03938502 ETH

(adan@kali) - [~/Desktop/Assignment 4/Assignment 4]
$

```

## Migrating the contract onto the blockchain

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## New Contracts added to the blockchain



```
truffle(ganache)> instance.listItems().then(value=>value.toString())  
'Item A,10,0x00000000000000000000000000000000,0x41,Item B,20,0x000000000000000000000000000000,0x41,Item C,30,0xa32224a049F2aA8C235163aad22DC942DF802869,0x58'  
truffle(ganache)>
```

Owner now received the payment, item status is now expired

The screenshot shows the Ganache application interface. At the top, there's a navigation bar with tabs for ACCOUNTS, BLOCKS, TRANSACTIONS, CONTRACTS, EVENTS, and LOGS. Below this is a status bar with various metrics like CURRENT BLOCK, GAS PRICE, GAS LIMIT, HARDFORK, NETWORK ID, RPC SERVER, and MINING STATUS. The main area displays the MNEMONIC and HD PATH. Below this, there's a table showing account balances.

ADDRESS	BALANCE	TX COUNT	INDEX	
0xFe308013aC0577817b41Ec1678102f1B7eF3B1fE	129.95 ETH	8	0	
0xa32224a049F2aA8C235163aad22DC942DF802869	70.00 ETH	2	1	
0x8311D566A61377385E414e401CEC161169a29e89	100.00 ETH	0	2	
ADDRESS	BALANCE	TX COUNT	INDEX	

Verifying the new balance of the owner

Year	1990	1995	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060	2065	2070	2075	2080	2085	2090	2095	2100
Population (millions)	5.3	5.7	6.1	6.5	6.9	7.3	7.7	8.1	8.5	8.9	9.3	9.7	10.1	10.5	10.9	11.3	11.7	12.1	12.5	12.9	13.3	13.7	14.1
GDP (trillion USD)	1.5	2.5	4.0	6.0	9.0	13.0	18.0	24.0	31.0	39.0	48.0	58.0	69.0	81.0	94.0	108.0	123.0	139.0	156.0	174.0	193.0	213.0	233.0
Life expectancy (years)	47	52	57	62	67	72	77	82	87	92	97	102	107	112	117	122	127	132	137	142	147	152	157

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Figure 1. The effect of the number of trials on the number of correct responses. The number of correct responses was significantly higher for the 10 trials condition than for the 5 trials condition. Error bars represent the standard error of the mean.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476	477	478	479	480	481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500	501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518	519	520	521	522	523	524	5
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Suppose the buyer got a faulty item, he changes the status to Disputed

```
truffle(ganache)> instance.listItems().then(value=>value.toString())
'Item A,10,0xa32224a049F2aA8C235163aad22DC942DF802869,0x52,Item B,20'
```

Disputed item resolved by TTP and buyer can reclaim his ethers.

```
truffle(ganache)> instance.receivePayment('Item A', {from:accounts[1]})
{
  tx: '0xbbf7804d3d1519a3e0f04e98778b4cd3b96faff70790b9e1f524d30ddaeb643d',
  receipt: {
    transactionHash: '0xbbf7804d3d1519a3e0f04e98778b4cd3b96faff70790b9e1f524d30ddaeb643d',
    transactionIndex: 0,
    blockHash: '0xe7c72fec18fc326592e161c5b9bd7a0f8c7734ae7e04a639f4c21e4f14df1633',
    blockNumber: 51,
    from: '0xa32224a049f2aa8c235163aad22dc942df802869',
    to: '0x3997dda66b617e948d8a7c3188d2462353e00796',
    gasUsed: 46064,
    cumulativeGasUsed: 46064,
```

Account 1 now calls to receive back his payment.

The screenshot shows the Ganache desktop application. The top navigation bar includes icons for ACCOUNTS, BLOCKS, TRANSACTIONS, CONTRACTS, EVENTS, and LOGS, along with a search bar for block numbers. Below this is a status bar with various settings: CURRENT BLOCK 51, GAS PRICE 20000000000, GAS LIMIT 6721975, HARDFORK MUIRGLACIER, NETWORK ID 5777, RPC SERVER HTTP://127.0.0.1:7545, MINING STATUS AUTOMINING, and WORKSPACE ASSIGNMENT-4-FINA. A SWITCH button and a settings gear icon are also present.

The main content area displays the MNEMONIC and HD PATH. The MNEMONIC is "siren sadness same close ladder exile all rather alter question quantum focus". The HD PATH is "m/44'/60'/0'/0/account\_index".

ADDRESS	BALANCE	TX COUNT	INDEX	
0xFe308013aC0577817b41Ec1678102f1B7eF3B1fE	139.81 ETH	27	0	
0xa32224a049F2aA8C235163aad22DC942DF802869	19.98 ETH	20	1	
0x8311D566A61377385E414e401CEC161169a29e89	100.00 ETH	4	2	

Balance of account 1 now restored.