Unit 15, part 57
Contribution to Unit 15, part 54.1, pp 7-9 by Dr. Dagmar Schönfeld

calculated with Mathematica®

In[92]:=
```
(* Transformation algorithm *)
anz = 100; a = Table[0, {i, anz}]; c = 1;
x = E; a[[1]] = IntegerPart[x];
Table[{x = (x - IntegerPart[x])^-c; a[[i]] = IntegerPart[x];}, {i, 2, anz}];
Print[a];(* N[FromContinuedFraction[a],20]; *)
```

```
{2, 1, 2, 1, 1, 4, 1, 1, 6, 1, 1, 8, 1, 1, 10, 1, 1, 12, 1, 1, 14, 1, 1, 16, 1,
 1, 18, 1, 1, 20, 1, 1, 22, 1, 1, 24, 1, 1, 26, 1, 1, 28, 1, 1, 30, 1, 1, 32, 1, 1,
 34, 1, 1, 36, 1, 1, 38, 1, 1, 40, 1, 1, 42, 1, 1, 44, 1, 1, 46, 1, 1, 48, 1, 1, 50,
 1, 1, 52, 1, 1, 54, 1, 1, 56, 1, 1, 58, 1, 1, 60, 1, 1, 62, 1, 1, 64, 1, 1, 66, 1}
```

In[95]:=
```
(*Inversion *)
x = 0; d = 1 / c; Table[x = (x + a[[i]])^-d, {i, anz, 1, -1}]; Print[N[1 / x, 20]];
```

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2.7182818284590452354
```

In[5]:=
```
(* Transformation algorithm *)
anz = 100; a = Table[0, {i, anz}]; c = 2;
x = E; a[[1]] = IntegerPart[x];
Table[{x = (x - IntegerPart[x])^-c; a[[i]] = IntegerPart[x];}, {i, 2, anz}];
Print[a];(* N[FromContinuedFraction[a],20]; *)
```

```
{2, 1, 1, 54, 96, 4, 36, 487, 1, 1, 23, 1, 23, 1, 1, 2, 7, 1, 1, 1, 15, 2, 9, 38, 178, 17,
 46, 8, 3, 20, 9, 1, 1, 92, 9, 52, 1, 685, 11, 1, 1, 172, 1, 3, 1, 331, 2, 5, 1, 4, 3,
 2, 1, 11, 1, 19, 2, 1, 1, 5, 491, 3, 2, 1, 4, 2, 2, 58, 2, 37, 10, 38, 3, 16, 2, 124,
 1, 8, 1, 19, 1, 48, 2, 2, 6, 38, 34, 2, 54, 6, 4, 2, 2, 2, 2377, 48, 102, 1, 4, 1}
```

In[8]:=
```
d = 1 / c; Table[x = (x + a[[i]])^-d, {i, anz, 1, -1}]; Print[N[(1 / x)^1/d, 20]];
```

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2.7182818284590452354
```

In[9]:=
```
(*Inversion *)
x = 0; d = 1 / c; Table[x = (x + a[[i]])^-d, {i, anz, 1, -1}]; Print[N[(1 / x)^1/d, 20]];
```

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2.7182818284590452354
```

In[10]:=
```
(* Transformation algorithm *)
anz = 100; a = Table[0, {i, anz}]; c = 3;
x = E; a[[1]] = IntegerPart[x];
Table[{x = (x - IntegerPart[x])^-c; a[[i]] = IntegerPart[x];}, {i, 2, anz}];
Print[a];(* N[FromContinuedFraction[a],20]; *)
```

```
{2, 2, 2, 1, 88, 1, 14, 2, 1223, 140, 197, 3057078, 7, 1, 1, 3340, 179, 108, 4,
 4078, 2, 480, 1, 993, 1, 3, 252, 2, 2, 1023, 41, 64, 44, 1, 8, 1, 63, 176, 6, 1,
 11, 4, 329779, 18, 600, 15, 769453, 50, 1, 32, 1, 2, 2, 94, 1, 77, 943, 30, 1,
 689, 1, 1, 6, 16247503, 1, 1203275, 2, 5, 11, 36, 827, 6, 5, 1, 5, 46, 1, 3, 9, 3,
 1482, 369, 9, 7, 9, 38, 1, 6, 56, 1, 16657, 5, 4138, 14, 861, 6, 2, 23, 25741, 6}
```

In[13]:=
```
(*Inversion *)
x = 0; d = 1 / c; Table[x = (x + a[[i]])^-d, {i, anz, 1, -1}]; Print[N[(1 / x)^1/d, 20]];
```

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2.7182818284590452354
```

In[14]:=
```
(* Transformation algorithm *)
anz = 100; a = Table[0, {i, anz}]; c = 4;
x = E; a[[1]] = IntegerPart[x];
Table[{x = (x - IntegerPart[x])^-c; a[[i]] = IntegerPart[x];}, {i, 2, anz}];
Print[a];(* N[FromContinuedFraction[a],20]; *)
```

```
{2, 3, 3, 186 981, 1264, 7, 4, 12, 2, 7, 1, 1, 238, 2, 1, 4, 498, 704, 213, 2, 2274, 2, 1, 1,
 121, 53 303, 26, 496, 1, 5, 360, 24, 1, 7, 132, 238, 37 668 943 098, 26, 1, 44 779 720,
 5, 9, 1, 207, 23 108, 1, 51, 896, 3, 210, 2 441 644 506, 5, 3, 3, 137, 21 386 075 413, 52,
 32 293, 39, 23, 3819, 2, 8, 17, 47, 440, 16, 424, 1, 1, 2, 99, 4, 10, 68, 2, 3, 1, 46, 36,
 6199, 58, 8, 1, 5083, 81, 32, 6, 3, 207, 4 804 233, 8, 4, 993, 1, 9330, 533, 227, 1, 1}
```

In[17]:=
```
(*Inversion *)
x = 0; d = 1 / c; Table[x = (x + a[[i]])^-d, {i, anz, 1, -1}]; Print[N[(1 / x)^1/d, 20]];
```

```
2.7182818284590452354
```

```
Mod[3, 3]
```

```
0
```

In[89]:=
```
(* Transformation algorithm *)
anz = 100; a = Table[0, {i, anz}]; c = {1, 2}; j = 1;
x = E; Print[N[E, 20]]; a[[1]] = IntegerPart[x];
Table[{x = (x - IntegerPart[x])^-c[[j]];
  If[j == 1, j = 2, j = 1]; a[[i]] = IntegerPart[x];}, {i, 2, anz}];
Print[a]; (* N[FromContinuedFraction[a],20]; *)
```

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2.7182818284590452354
```

```
{2, 1, 6, 1, 1, 178, 6, 12, 5, 1, 122, 1, 2, 1, 2, 1, 6, 1, 336, 4, 1, 1, 12, 2, 19,
 1, 1, 7, 4, 1, 21, 22, 244, 1, 55, 1, 235, 12, 4, 2, 1, 39, 13, 1, 15, 1, 68, 4, 16,
 20, 2, 2, 5, 4, 6, 1, 59, 2, 3, 4, 1, 1, 1, 2, 3, 1, 33, 2, 31, 1, 12, 1, 4, 107, 1,
 6, 172, 3, 6, 1, 23, 4, 4, 1, 50, 7, 2, 5, 1, 1, 26, 1, 1861, 3, 1, 11, 5, 2, 2, 3}
```

In[68]:=
```
2 + (1 + (6 + (1 + (1 + (0 + 178)^-1)^-0.5)^-1)^-0.5)^-1
```

Out[68]=
```
2.71828
```

In[88]:=
```
(*Inversion *)
x = 0; d = {1 / 1, 1 / 2}; j = 1;
Table[{x = (x + a[[i]])^-d[[j]]; If[j == 2, j = 1, j = 2];}, {i, anz, 2, -1}];
Print[N[a[[1]] + x, 20]];
```

```
2.7182818284590452354
```

In[96]:=
```
(* Transformation algorithm *)
anz = 200; a = Table[0, {i, anz}]; c = {1, 2}; j = 1;
x = E; Print[N[E, 40]]; a[[1]] = IntegerPart[x];
Table[{x = (x - IntegerPart[x])^-c[[j]];
  If[j == 1, j = 2, j = 1]; a[[i]] = IntegerPart[x];}, {i, 2, anz}];
Print[a]; (* N[FromContinuedFraction[a],20]; *)
```

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2.71828182845904523536028747135266249775 7
```

```
{2, 1, 6, 1, 1, 178, 6, 12, 5, 1, 122, 1, 2, 1, 2, 1, 6, 1, 336, 4, 1, 1, 12, 2,
 19, 1, 1, 7, 4, 1, 21, 22, 244, 1, 55, 1, 235, 12, 4, 2, 1, 39, 13, 1, 15, 1, 68,
 4, 16, 20, 2, 2, 5, 4, 6, 1, 59, 2, 3, 4, 1, 1, 1, 2, 3, 1, 33, 2, 31, 1, 12, 1, 4,
 107, 1, 6, 172, 3, 6, 1, 23, 4, 4, 1, 50, 7, 2, 5, 1, 1, 26, 1, 1861, 3, 1, 11, 5,
 2, 2, 3, 34, 1, 1, 1, 2, 4, 3, 1, 13, 2, 5, 1, 5, 2, 2, 1, 35, 6, 16, 2, 3, 1, 2, 2,
 2, 2, 1, 1, 80, 10, 1, 3, 64, 19, 1, 1, 8, 3, 5, 7, 1, 1, 3, 1, 2, 2, 1, 6, 13, 1,
 135, 2, 21, 6, 1, 3, 38, 1, 104, 1, 3, 24, 1, 148, 1, 9, 1, 1, 1, 3, 9, 43, 1, 5,
 13, 3, 1, 11, 3, 2, 29, 1, 1, 1, 12, 2, 28, 5, 3, 3, 29, 8, 1, 2, 38, 2, 3, 1, 1, 23}
```

In[99]:=
```
(*Inversion *)
x = 0; d = {1 / 1, 1 / 2}; j = 1;
Table[{x = (x + a[[i]])^-d[[j]]; If[j == 2, j = 1, j = 2];}, {i, anz, 2, -1}];
Print[N[a[[1]] + x, 40]];
```

```
2.71828182845904523536028747135266249775 7
```