

■ W_n の確率計算

```
In[1]:= f[x_] := x2 /; x ≥ 0
```

```
In[2]:= f[3]
```

```
Out[2]= 9
```

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In[3]:= f[-2]
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```
Out[3]= f[-2]
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In[4]:= f[x_] := -x2 /; x < 0
```

```
In[5]:= f[-2]
```

```
Out[5]= -4
```

```
In[6]:= ?f
```

```
Global`f
```

```
f[x_] := x2 /; x ≥ 0
```

```
f[x_] := -x2 /; x < 0
```

```
In[7]:= Clear[f]
```

```
In[8]:= ?f
```

```
Global`f
```

```
In[9]:= m[n_, k_] := 0 /; k < 0:
```

```
In[10]:= m[n_, k_] := 0 /; k > n (n + 1) / 2
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```
In[11]:= m[1, 0] = m[1, 1] = 1
```

```
Out[11]= 1
```

```
In[12]:= m[n_, k_] := m[n - 1, k] + m[n - 1, k - n]
```

```
In[13]:= ?m
```

```
Global`m
```

```
m[1, 0] = 1
```

```
m[1, 1] = 1
```

```
m[n_, k_] := 0 /; k < 0:
```

```
m[n_, k_] := 0 /; k >  $\frac{1}{2}$  n (n + 1)
```

```
m[n_, k_] := m[n - 1, k] + m[n - 1, k - n]
```

```
In[14]:= Table[m[3, i], {i, 0, 6}]
```

```
Out[14]= {1, 1, 1, 2, 1, 1, 1}
```

In[15]:= Timing[Table[m[15, 1], {1, 0, 120}]]

Out[15]= {2.953 Second, {1, 1, 1, 2, 2, 3, 4, 5, 6, 8, 10, 12, 15, 18, 22, 27, 31, 36, 43, 49, 57, 66, 75, 85, 97, 109, 122, 137, 152, 168, 186, 203, 222, 243, 263, 285, 308, 330, 353, 378, 401, 425, 450, 473, 496, 521, 542, 564, 586, 605, 624, 642, 657, 671, 685, 695, 704, 712, 716, 719, 722, 719, 716, 712, 704, 695, 685, 671, 657, 642, 624, 605, 586, 564, 542, 521, 496, 473, 450, 425, 401, 378, 353, 330, 308, 285, 263, 243, 222, 203, 186, 168, 152, 137, 122, 109, 97, 85, 75, 66, 57, 49, 43, 36, 31, 27, 22, 18, 15, 12, 10, 8, 6, 5, 4, 3, 2, 2, 1, 1, 1}}

In[16]:= m[n_, k_] := m[n, k] = m[n - 1, k] + m[n - 1, k - n]

In[17]:= ?m

Global`m

m[1, 0] = 1

m[1, 1] = 1

m[n_, k_] := 0 /; k < 0:

m[n_, k_] := 0 /; k > $\frac{1}{2} n (n + 1)$

m[n_, k_] := m[n, k] = m[n - 1, k] + m[n - 1, k - n]

In[18]:= Timing[Table[m[15, 1], {1, 0, 120}]]

Out[18]= {0.031 Second, {1, 1, 1, 2, 2, 3, 4, 5, 6, 8, 10, 12, 15, 18, 22, 27, 31, 36, 43, 49, 57, 66, 75, 85, 97, 109, 122, 137, 152, 168, 186, 203, 222, 243, 263, 285, 308, 330, 353, 378, 401, 425, 450, 473, 496, 521, 542, 564, 586, 605, 624, 642, 657, 671, 685, 695, 704, 712, 716, 719, 722, 719, 716, 712, 704, 695, 685, 671, 657, 642, 624, 605, 586, 564, 542, 521, 496, 473, 450, 425, 401, 378, 353, 330, 308, 285, 263, 243, 222, 203, 186, 168, 152, 137, 122, 109, 97, 85, 75, 66, 57, 49, 43, 36, 31, 27, 22, 18, 15, 12, 10, 8, 6, 5, 4, 3, 2, 2, 1, 1, 1}}

In[19]:= ?m

In[20]:= Clear[m]

In[21]:= ?m

Global`m

In[22]:= m[n_, k_] := 0 /; k < 0

In[23]:= m[n_, k_] := 0 /; k > $n (n + 1) / 2$

In[24]:= m[1, 0] = m[1, 1] = 1

Out[24]= 1

In[25]:= m[n_, k_] := m[n, $\frac{n (n + 1)}{2} - k$] /; k > $\frac{n (n + 1)}{4}$

In[26]:= m[n_, k_] := m[n, k] = m[n - 1, k] + m[n - 1, k - n]

```
In[27]:= Timing[Table[m[15, 1], {1, 0, 120}]]
```

```
Out[27]= {0. Second, {1, 1, 1, 2, 2, 3, 4, 5, 6, 8, 10, 12, 15, 18, 22, 27, 31, 36, 43, 49, 57, 66,
75, 85, 97, 109, 122, 137, 152, 168, 186, 203, 222, 243, 263, 285, 308, 330,
353, 378, 401, 425, 450, 473, 496, 521, 542, 564, 586, 605, 624, 642, 657,
671, 685, 695, 704, 712, 716, 719, 722, 719, 716, 712, 704, 695, 685, 671,
657, 642, 624, 605, 586, 564, 542, 521, 496, 473, 450, 425, 401, 378, 353,
330, 308, 285, 263, 243, 222, 203, 186, 168, 152, 137, 122, 109, 97, 85, 75,
66, 57, 49, 43, 36, 31, 27, 22, 18, 15, 12, 10, 8, 6, 5, 4, 3, 2, 2, 1, 1, 1}}
```

```
In[28]:= ?m
```

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In[29]:= Timing[Table[m[10, 1], {1, 0, 55}]]
```

```
Out[29]= {0. Second, {1, 1, 1, 2, 2, 3, 4, 5, 6, 8, 10, 11, 13, 15, 17, 20, 22,
24, 27, 29, 31, 33, 35, 36, 38, 39, 39, 40, 40, 39, 39, 38, 36, 35, 33,
31, 29, 27, 24, 22, 20, 17, 15, 13, 11, 10, 8, 6, 5, 4, 3, 2, 2, 1, 1, 1}}
```

```
In[30]:= i = 0
```

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Out[30]= 0
```

```
In[31]:= p = m[10, 1] / 210
```

```
Out[31]=  $\frac{1}{1024}$ 
```

```
In[32]:= While[p < 0.05, i = i + 1; p = Sum[m[10, j] / 210, {j, 0, i}]]
```

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In[33]:= i
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Out[33]= 11
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In[34]:= N[p]
```

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Out[34]= 0.0527344
```