Princeton University
COS 217: Introduction to Programming Systems
Trace of testforkloop

```
% gcc217 testforkloop.c -o testforkloop
```

```
% ./testforkloop
```

```
9857

int main(void)
{
   pid_t iPid;
   int i;
   printf("%d parent\n",
       (int)getPid());
   fflush(NULL);
   iPid = fork();
   if (iPid == 0)
   {  for (i = 0; i < 10; i++)
         printf("%d child %d\n",
             (int)getPid(), i);
      exit(0);
   }
   for (i = 0; i < 10; i++)
      printf("%d parent %d\n",
         (int)getPid(), i);
   return 0;
}
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         (int)getPid(), i);
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```
% ./testforkloop
```

```
9857
─────────────────────────────
int main(void)
{
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   iPid = fork();
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            (int)getPid(), i);
      exit(0);
   }
   for (i = 0; i < 10; i++)
      printf("%d parent %d\n",
         (int)getPid(), i);
   return 0;
}
```

Writes:

```
9857 parent
```

```
% ./testforkloop
```

```
9857
int main(void)
{
   pid_t iPid;
   int i;
   printf("%d parent\n",
      (int)getPid());
   fflush(NULL);
   iPid = fork();
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   {  for (i = 0; i < 10; i++)
         printf("%d child %d\n",
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```
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int main(void)
{
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      (int)getPid());
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   if (iPid == 0)
   {  for (i = 0; i < 10; i++)
         printf("%d child %d\n",
            (int)getPid(), i);
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   }
   for (i = 0; i < 10; i++)
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         (int)getPid(), i);
   return 0;
}
```

concurrent

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Assume OS gives CPU to parent

```
% ./testforkloop
```

9857

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9858

9858

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int main(void)
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   pid_t iPid;
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   iPid = fork();
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9858

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        exit(0);
    }
    for (i = 0; i < 10; i++)
        printf("%d parent %d\n",
            (int)getPid(), i);
    return 0;
}
```

concurrent

Writes:

```
9857 parent 0 ... 7
```

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Assume OS gives CPU to child

```
% ./testforkloop
```

9857

```
int main(void)
{
   pid_t iPid;
   int i;
   printf("%d parent\n",
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concurrent

9858

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   pid_t iPid;
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   printf("%d parent\n",
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   fflush(NULL);
   iPid = fork();
   if (iPid == 0)
   {  for (i = 0; i < 10; i++)
         printf("%d child %d\n",
            (int)getPid(), i);
      exit(0);
   }
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Assume OS gives CPU to child

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9857

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          printf("%d child %d\n",
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   }
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         (int)getPid(), i);
   return 0;
}
```

concurrent

9858

```
int main(void)
{
   pid_t iPid;
   int i;
   printf("%d parent\n",
       (int)getPid());        0
   fflush(NULL);
   iPid = fork();
   if (iPid == 0)
   {   for (i = 0; i < 10; i++)
          printf("%d child %d\n",
             (int)getPid(), i);
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Assume OS gives CPU to child

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   pid_t iPid;
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   }
   for (i = 0; i < 10; i++)
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         (int)getPid(), i);
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```

```
9858
int main(void)
{
   pid_t iPid;
   int i;
   printf("%d parent\n",
      (int)getPid());            0
   fflush(NULL);
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   if (iPid == 0)
   {  for (i = 0; i < 10; i++)
         printf("%d child %d\n",
            (int)getPid(), i);
      exit(0);
   }
   for (i = 0; i < 10; i++)
      printf("%d parent %d\n",
         (int)getPid(), i);
   return 0;
}
```

concurrent

Writes:
```
9858 child 0
```

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Assume OS gives CPU to parent

```
% ./testforkloop
```

9857

```
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   pid_t iPid;
   int i;
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9858

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   pid_t iPid;
   int i;
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   {  for (i = 0; i < 10; i++)
         printf("%d child %d\n",
            (int)getPid(), i);
      exit(0);
   }
   for (i = 0; i < 10; i++)
      printf("%d parent %d\n",
         (int)getPid(), i);
   return 0;
}
```

concurrent

Writes:

```
9857 parent 8
```

Assume OS gives CPU to child

```
% ./testforkloop
```

```
9857

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```

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9858

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      (int)getPid());        0
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   {  for (i = 0; i < 10; i++)
         printf("%d child %d\n",
            (int)getPid(), i);
      exit(0);
   }
   for (i = 0; i < 10; i++)
      printf("%d parent %d\n",
         (int)getPid(), i);
   return 0;
}
```

concurrent

Writes:
```
9858 child 1
```

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Assume OS gives CPU to parent

```
% ./testforkloop
```

```
9857

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```

```
9858

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         printf("%d child %d\n",
            (int)getPid(), i);
      exit(0);
   }
   for (i = 0; i < 10; i++)
      printf("%d parent %d\n",
         (int)getPid(), i);
   return 0;
}
```

concurrent

Writes:
```
9857 parent 9
```

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Assume OS gives CPU to parent

```
% ./testforkloop
```

```
9857
int main(void)
{
    pid_t iPid;
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concurrent

```
9858
int main(void)
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    {   for (i = 0; i < 10; i++)
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                (int)getPid(), i);
        exit(0);
    }
    for (i = 0; i < 10; i++)
        printf("%d parent %d\n",
            (int)getPid(), i);
    return 0;
}
```

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```
% ./testforkloop
```

```
9858
───────────────────────────────────────
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         printf("%d child %d\n",
            (int)getPid(), i);
      exit(0);
   }
   for (i = 0; i < 10; i++)
      printf("%d parent %d\n",
         (int)getPid(), i);
   return 0;
}
```

Writes:
```
9858 child 2 ... 9
```

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```
% ./testforkloop
```

```
0858
int main(void)
{
    pid_t iPid;
    int i;
    printf("%d parent\n",
        (int)getPid());
    fflush(NULL);
    iPid = fork();
    if (iPid == 0)
    {   for (i = 0; i < 10; i++)
            printf("%d child %d\n",
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        exit(0);
    }
    for (i = 0; i < 10; i++)
        printf("%d parent %d\n",
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```

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