

Informatika, 2. maila

# PowerShell

# Zer da PowerShell?

PowerShell komando linea interfaze bat eta scripton lengoai bat da, Microsoft-ek garatua.

## Helburua

- Sistema adimnistrazioaren automatizazioa.
- Sistema konfigurazioen gestioa.

## Ezaugarriak

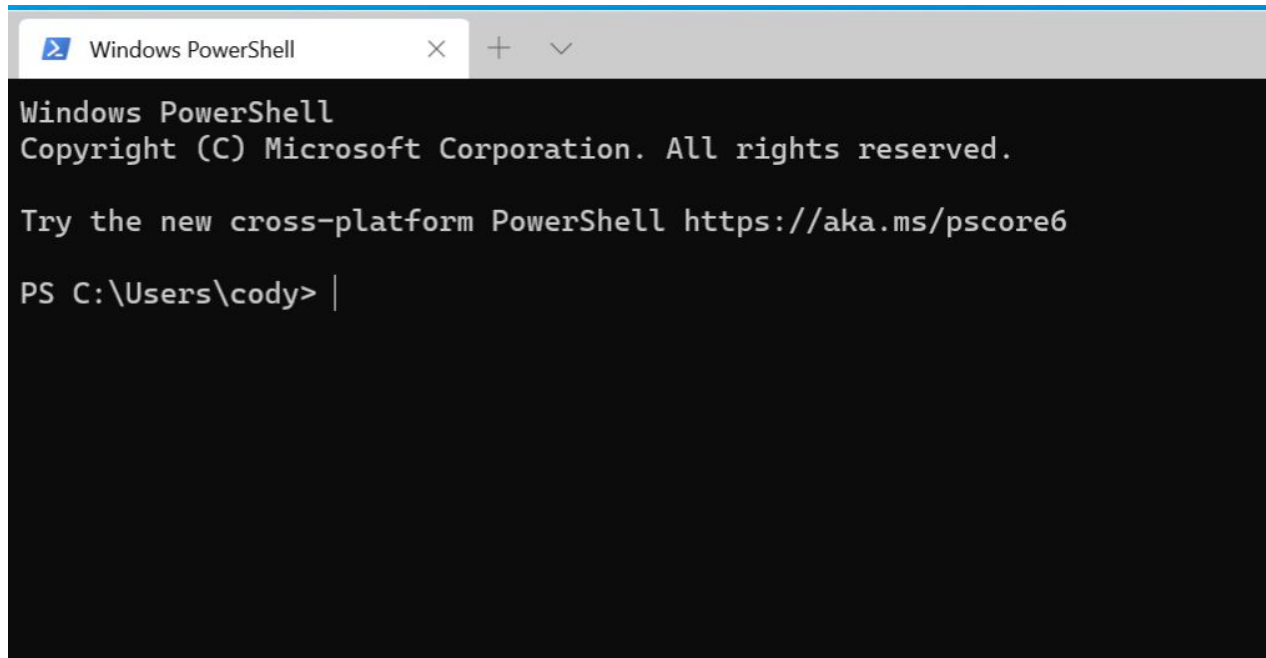
- Windows-ekin integrazioa.
- Multiplataforma (Windows, MAC eta Linux).
- Kodigo pertsonalizatua idatzi daiteke.
- Automatizazioa (erabiltzaileen kudeaketa, sareko konfigurazioak, baimenak...).



# Zertarako erabiltzen da PowerShell?

- **Erabiltzaile eta taldeen kudeaketa.**
  - Erabiltzaileak sortu, ezabatu, aldatu.
  - Baimenak.
- **Zerbitzari eta ordenagailuen kudeaketa**
  - Eguneraketak instalatu.
  - Segurtasun politikak aplikatu.
  - Monitorizazioa eta arazoen identifikazioa.
  - ...
- **Sareen gestioa**
  - Sare txartelen konfigurazioa.
  - IP helbideak, DNS, DHCP...
- **Lan administratiboen automatizazioa**
  - Segurtasun kopiak.
  - Erregistroen garbiketa.
  - Informeak sortu.
  - ...
- ...

# Non idazten da PowerShell?



A screenshot of a Windows PowerShell console window. The title bar shows 'Windows PowerShell' with standard window controls. The console text includes the Windows PowerShell logo, copyright notice for Microsoft Corporation, a link to the cross-platform PowerShell, and the current prompt 'PS C:\Users\cody>'.

```
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.

Try the new cross-platform PowerShell https://aka.ms/pscore6

PS C:\Users\cody> |
```

PowerShell komando linea  
interfazea.

```
# Define the threshold for disk space in bytes (10 GB in this case)
$threshold = 10GB

# Define the email parameters
$smtpServer = "smtp.your-email-provider.com"
$smtpFrom = "alert@yourdomain.com"
$smtpTo = "admin@yourdomain.com"
$subject = "Disk Space Alert"

# Get the list of all drives
$drives = Get-PSDrive -PSProvider FileSystem

# Initialize an empty array to store alert messages
$alerts = @()

# Check each drive's free space
foreach ($drive in $drives) {
    if ($drive.Free -lt $threshold) {
        $alerts += "Drive $($([math]::Round($drive.Free / 1GB, 2)) GB left)"
    }
}

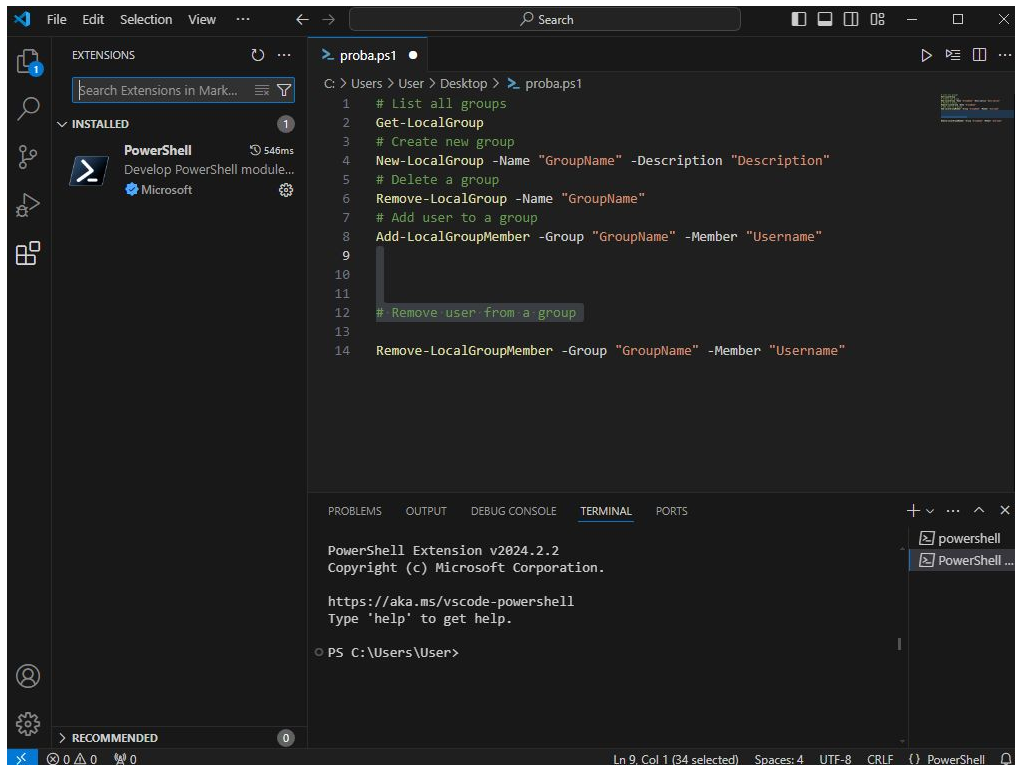
# If there are any alerts, send an email
if ($alerts.Count -gt 0) {
    $body = $alerts -join "`n"
    $message = New-Object system.net.mail.mailmessage
    $message.from = $smtpFrom
    $message.To.add($smtpTo)
    $message.Subject = $subject
    $message.Body = $body
    $smtp = New-Object Net.Mail.SmtpClient($smtpServer)
    $smtp.Send($message)
    Write-Output "Alert email sent."
} else {
    Write-Output "All drives have sufficient free space."
}
```

PowerShell scripta.

# PowerShell garapen guneak

## Visual Studio Code

- PowerShell addon-a instalatuta.

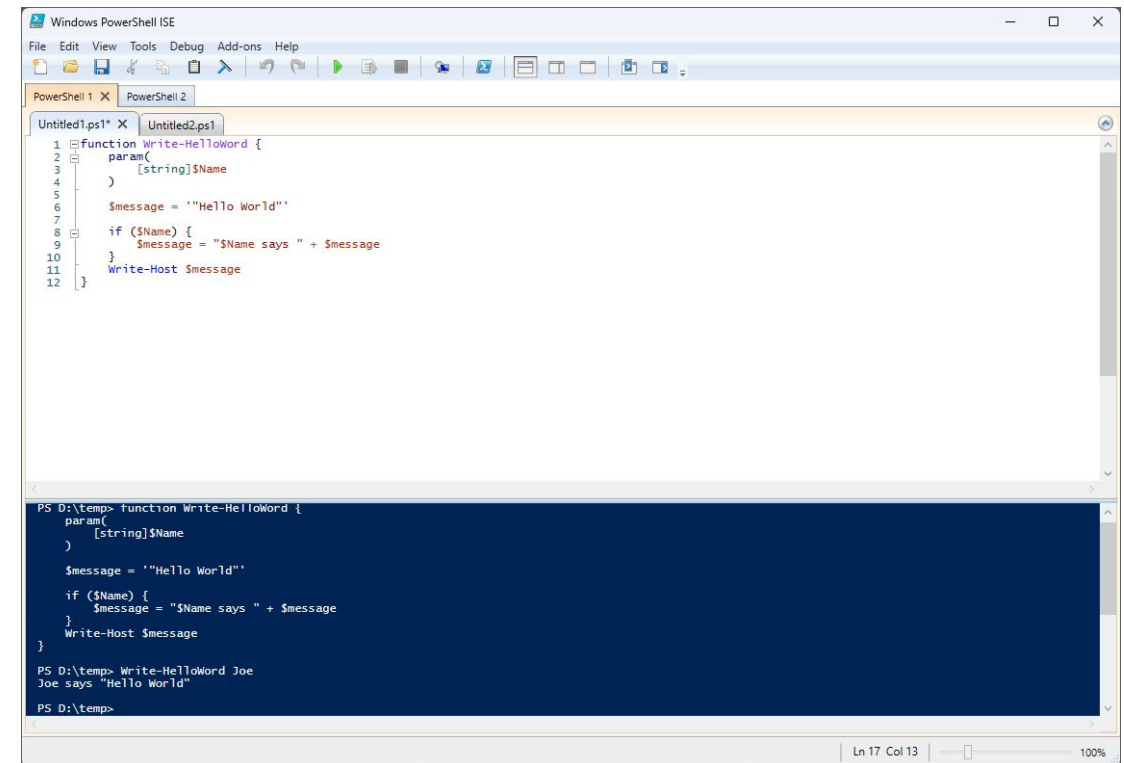


The screenshot shows the Visual Studio Code editor with the PowerShell extension installed. The left sidebar displays the 'EXTENSIONS' view with 'PowerShell' by Microsoft listed under 'INSTALLED'. The main editor area shows a PowerShell script named 'proba.ps1' with the following content:

```
1 # List all groups
2 Get-LocalGroup
3 # Create new group
4 New-LocalGroup -Name "GroupName" -Description "Description"
5 # Delete a group
6 Remove-LocalGroup -Name "GroupName"
7 # Add user to a group
8 Add-LocalGroupMember -Group "GroupName" -Member "Username"
9
10
11
12 # Remove user from a group
13
14 Remove-LocalGroupMember -Group "GroupName" -Member "Username"
```

The bottom panel shows the 'TERMINAL' view with the PowerShell extension v2024.2.2 installed, displaying the prompt 'PS C:\Users\User>'.

## Windows PowerShell ISE



The screenshot shows the Windows PowerShell ISE (Integrated Scripting Environment) with a PowerShell script named 'Untitled1.ps1' being edited. The script content is:

```
1 function Write-HelloWord {
2     param(
3         [string]$Name
4     )
5
6     $message = "Hello World"
7
8     if ($Name) {
9         $message = "$Name says " + $message
10    }
11    Write-Host $message
12 }
```

The bottom panel shows the PowerShell console with the command 'Write-HelloWord Joe' executed, resulting in the output 'Joe says "Hello World"'.

**Edozein testu editore erabili daiteke!**

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## **Oinarrizko komandoak**

# Oinarrizko komandoak

- Direktorio eta fitxategiak zerrendatu
  - ls

```
PS C:\Users\Administrator> ls

Directory: C:\Users\Administrator

Mode                LastWriteTime         Length Name
----                -
d-r--             14/06/2024         1:52      3D Objects
d-r--             14/06/2024         1:52      Contacts
d-r--             22/07/2024        15:59      Desktop
d-r--             14/06/2024         1:52      Documents
d-r--             23/07/2024         9:35      Downloads
d-r--             14/06/2024         1:52      Favorites
d-r--             14/06/2024         1:52      Links
d-r--             14/06/2024         1:52      Music
d-r--             14/06/2024         1:52      Pictures
d-r--             14/06/2024         1:52      Saved Games
d-r--             14/06/2024         1:52      Searches
d-r--             14/06/2024         1:52      Videos
```

# Oinarrizko komandoak

- Direktorioz mugitu edo aldatu
  - cd

```
PS C:\Users\Administrator> ls

Directory: C:\Users\Administrator

Mode                LastWriteTime         Length Name
----                -
d-r---            14/06/2024         1:52      3D Objects
d-r---            14/06/2024         1:52      Contacts
d-r---            22/07/2024        15:59      Desktop
d-r---            14/06/2024         1:52      Documents
d-r---            23/07/2024         9:35      Downloads
d-r---            14/06/2024         1:52      Favorites
d-r---            14/06/2024         1:52      Links
d-r---            14/06/2024         1:52      Music
d-r---            14/06/2024         1:52      Pictures
d-r---            14/06/2024         1:52      Saved Games
d-r---            14/06/2024         1:52      Searches
d-r---            14/06/2024         1:52      Videos

PS C:\Users\Administrator> cd Desktop
PS C:\Users\Administrator\Desktop> cd ..
PS C:\Users\Administrator> █
```



# Oinarrizko komandoak

- Terminala garbitu
  - clear

```
PS C:\Users\Administrator> ls

Directory: C:\Users\Administrator

Mode                LastWriteTime         Length Name
----                -
d-r-- 14/06/2024 1:52             3D Objects
d-r-- 14/06/2024 1:52             Contacts
d-r-- 22/07/2024 15:59             Desktop
d-r-- 14/06/2024 1:52             Documents
d-r-- 23/07/2024 9:35             Downloads
d-r-- 14/06/2024 1:52             Favorites
d-r-- 14/06/2024 1:52             Links
d-r-- 14/06/2024 1:52             Music
d-r-- 14/06/2024 1:52             Pictures
d-r-- 14/06/2024 1:52             Saved Games
d-r-- 14/06/2024 1:52             Searches
d-r-- 14/06/2024 1:52             Videos

PS C:\Users\Administrator> cd Desktop
PS C:\Users\Administrator\Desktop> cd ..
PS C:\Users\Administrator> clear
```

PS C:\Users\Administrator>

# Oinarrizko komandoak

- Direktorio (karpeta) bat sortu
  - mkdir

```
PS C:\Users\Administrator> mkdir karpeta_berria

Directory: C:\Users\Administrator


Mode                LastWriteTime         Length Name
----                -
d-----         23/08/2024     8:56             karpeta_berria

PS C:\Users\Administrator> ls

Directory: C:\Users\Administrator


Mode                LastWriteTime         Length Name
----                -
d-r---         14/06/2024     1:52             3D Objects
d-r---         14/06/2024     1:52             Contacts
d-r---         22/07/2024    15:59             Desktop
d-r---         14/06/2024     1:52             Documents
d-r---         23/07/2024     9:35             Downloads
d-r---         14/06/2024     1:52             Favorites
d-----         23/08/2024     8:56             karpeta_berria
d-r---         14/06/2024     1:52             Links
d-r---         14/06/2024     1:52             Music
d-r---         14/06/2024     1:52             Pictures
d-r---         14/06/2024     1:52             Saved Games
d-r---         14/06/2024     1:52             Searches
d-r---         14/06/2024     1:52             Videos

PS C:\Users\Administrator> _
```

- Fitxategi bat sortu

- `New-Item -ItemType File -Name "filename.txt"`

```
PS C:\Users\Administrator> New-Item -ItemType File -Name "fitxategi_berria.txt"

Directory: C:\Users\Administrator

Mode                LastWriteTime         Length Name
----                -
-a-----         23/08/2024          9:04             0 fitxategi_berria.txt

PS C:\Users\Administrator> ls

Directory: C:\Users\Administrator

Mode                LastWriteTime         Length Name
----                -
d-r-----         14/06/2024          1:52         3D Objects
d-r-----         14/06/2024          1:52         Contacts
d-r-----         22/07/2024         15:59         Desktop
d-r-----         14/06/2024          1:52         Documents
d-r-----         23/07/2024          9:35         Downloads
d-r-----         14/06/2024          1:52         Favorites
d-----         23/08/2024          9:03      karpeta_berria
d-r-----         14/06/2024          1:52         Links
d-r-----         14/06/2024          1:52         Music
d-r-----         14/06/2024          1:52         Pictures
d-r-----         14/06/2024          1:52         Saved Games
d-r-----         14/06/2024          1:52         Searches
d-r-----         14/06/2024          1:52         Videos
-a-----         23/08/2024          9:04             0 fitxategi_berria.txt

PS C:\Users\Administrator> _
```

# Oinarrizko komandoak

- Direktorio (karpeta) edo fitxategi bat mugitzen
  - mv

```
PS C:\Users\Administrator> mv fitxategi_berria.txt karpeta_berria
PS C:\Users\Administrator> ls .\karpeta_berria\

Directory: C:\Users\Administrator\karpeta_berria

Mode                LastWriteTime         Length Name
----                -
-a----            23/08/2024     9:04             0 fitxategi_berria.txt

PS C:\Users\Administrator> _
```

# Oinarrizko komandoak

- Direktorio (karpeta) edo fitxategi bat kopiazen
  - cp

```
PS C:\Users\Administrator\karpeta_berria> ls

Directory: C:\Users\Administrator\karpeta_berria

Mode                LastWriteTime         Length Name
----                -
-a----            23/08/2024     9:04             0 fitxategi_berria.txt

PS C:\Users\Administrator\karpeta_berria> cp .\fitxategi_berria.txt .\fitxategi_berria_kopia.txt
PS C:\Users\Administrator\karpeta_berria> ls

Directory: C:\Users\Administrator\karpeta_berria

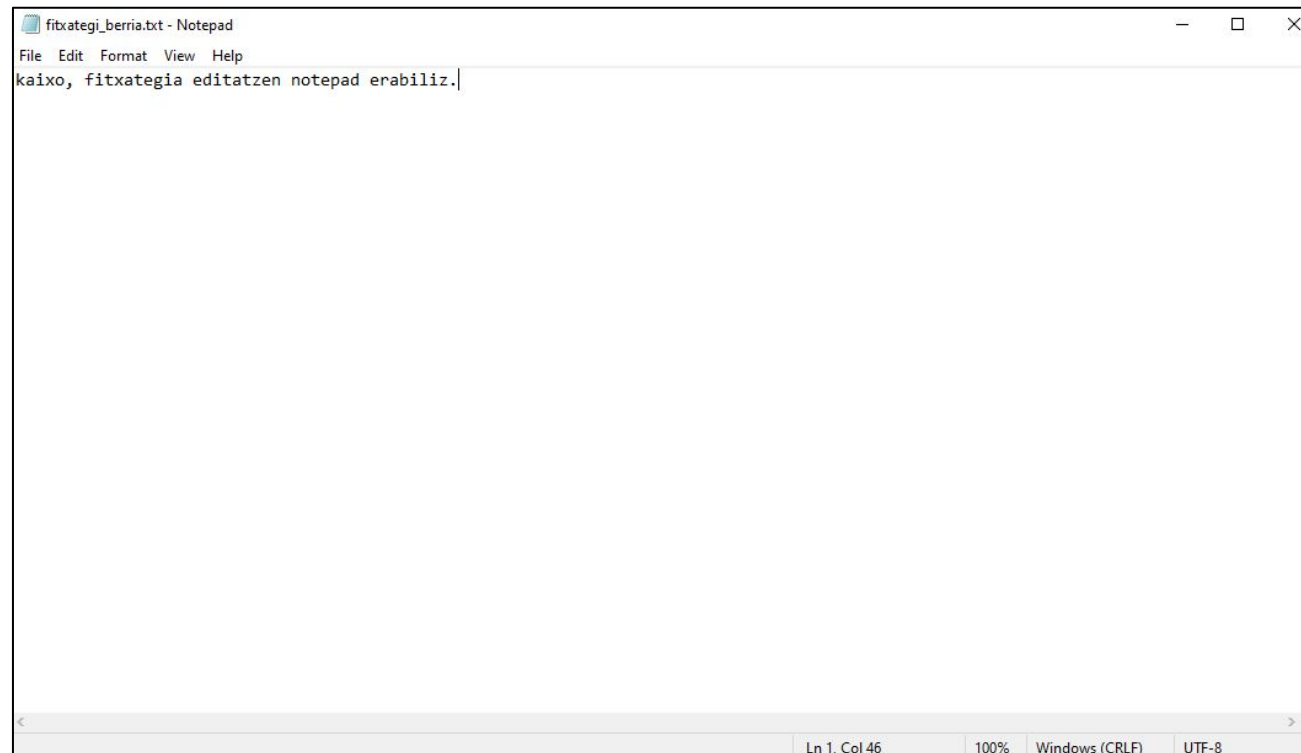
Mode                LastWriteTime         Length Name
----                -
-a----            23/08/2024     9:04             0 fitxategi_berria.txt
-a----            23/08/2024     9:04             0 fitxategi_berria_kopia.txt

PS C:\Users\Administrator\karpeta_berria>
```

# Oinarrizko komandoak

- **Fitxategi bat editatzen**
  - `notepad.exe fitxategia.txt`

```
PS C:\Users\Administrator\karpeta_berria> notepad.exe .\fitxategi_berria.txt
PS C:\Users\Administrator\karpeta_berria>
```



# Oinarrizko komandoak

- Fitxategi baten edukia bistaratzeko
  - `cat`

```
PS C:\Users\Administrator\karpeta_berria> cat .\fitxategi_berria.txt  
kaixo, fitxategia editatzen notepad erabiliz.  
PS C:\Users\Administrator\karpeta_berria>
```

# Oinarrizko komandoak

- Direktorio (karpeta) edo fitxategi bat ezabatzen
  - rm

```
PS C:\Users\Administrator> rm karpeta_berria
PS C:\Users\Administrator> ls

    Directory: C:\Users\Administrator

Mode                LastWriteTime         Length Name
----                -
d-r---            14/06/2024          1:52      3D Objects
d-r---            14/06/2024          1:52      Contacts
d-r---            22/07/2024         15:59      Desktop
d-r---            14/06/2024          1:52      Documents
d-r---            23/07/2024          9:35      Downloads
d-r---            14/06/2024          1:52      Favorites
d-r---            14/06/2024          1:52      Links
d-r---            14/06/2024          1:52      Music
d-r---            14/06/2024          1:52      Pictures
d-r---            14/06/2024          1:52      Saved Games
d-r---            14/06/2024          1:52      Searches
d-r---            14/06/2024          1:52      Videos

PS C:\Users\Administrator> _
```



2

## **Aldagaiak eta datu motak**

# Aldagaiak eta datu motak

- Aldagaien definizioa

Aldagaiak \$ karakterea hasieran ipinita definitzen dira:

- \$aldagaia1 = “Hello world”
- \$aldagaia2 = 108

# Aldagaiak eta datu motak

- Aldagai motak

```
$string = "Hello, World!"  
$integer = 42  
$float = 5.6  
$array = @(1,2,3,4,5)  
$arrayCount = $array.Count  
$booltrue = $true  
$boolfalse = $false
```

# Datu egiturak

- Aldagai motak

```
$hashTable = @{  
    Name = "John Doe"  
    Age = 30  
    Occupation = "Developer"  
}
```

```
$animals = @(  
    @{  
        Name      = "Lion"  
        Species   = "Panthera leo"  
        Habitat   = "Savanna"  
        Diet      = "Carnivore"  
    },  
    @{  
        Name      = "Elephant"  
        Species   = "Loxodonta africana"  
        Habitat   = "Forest"  
        Diet      = "Herbivore"  
    },  
    @{  
        Name      = "Dolphin"  
        Species   = "Delphinus delphis"  
        Habitat   = "Ocean"  
        Diet      = "Carnivore"  
    }  
)
```

# Aldagaiak eta datu motak

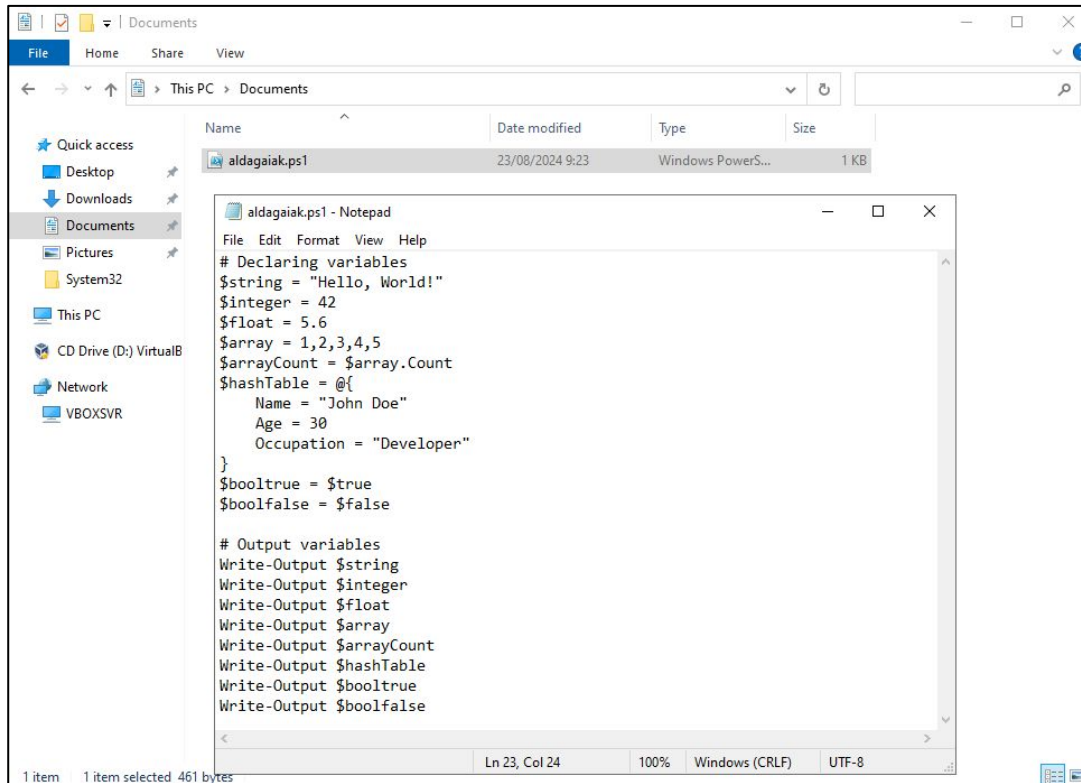
- Aldagai baten balioa bistaratzeko (print):
  - Write-Output \$aldagaia

```
PS C:\Users\Administrator> $mezua = "Hello, World!"  
PS C:\Users\Administrator> Write-Output $mezua  
Hello, World!  
PS C:\Users\Administrator>
```

**Terminal baten aldagai bat definitzen denean, terminala itxi egiten denean galdu egingo da. Zabalik dagoen bitartean bakarrik egongo da aldagaia eskuragarri.**

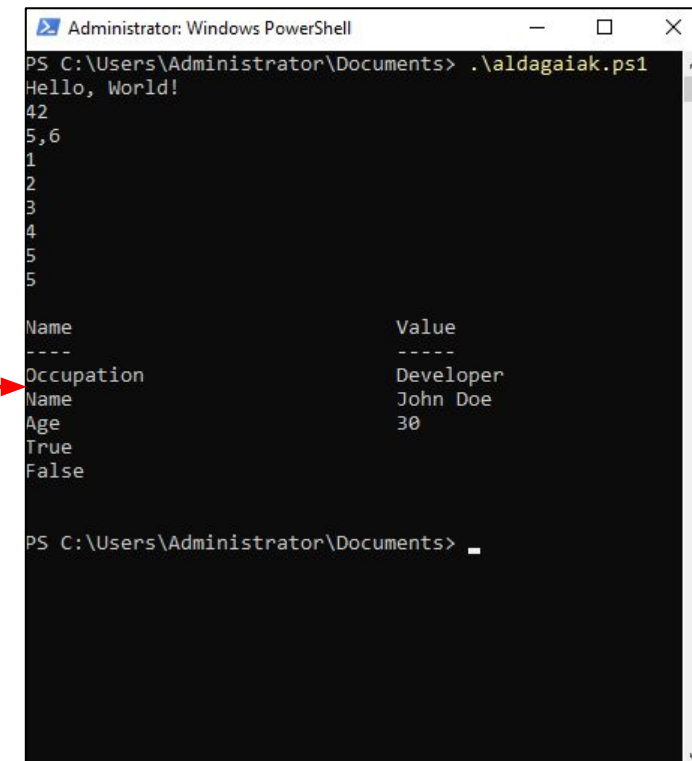
# Aldagaiak eta datu motak

- Aldagaiak PowerShell script batean erabiltzen (.ps1 fitxategi baten):



```
File Edit Format View Help
# Declaring variables
$string = "Hello, World!"
$integer = 42
$float = 5.6
$array = 1,2,3,4,5
$arrayCount = $array.Count
$hashTable = @{
    Name = "John Doe"
    Age = 30
    Occupation = "Developer"
}
$booltrue = $true
$boolfalse = $false

# Output variables
Write-Output $string
Write-Output $integer
Write-Output $float
Write-Output $array
Write-Output $arrayCount
Write-Output $hashTable
Write-Output $booltrue
Write-Output $boolfalse
```



```
Administrator: Windows PowerShell
PS C:\Users\Administrator\Documents> .\aldagaiak.ps1
Hello, World!
42
5,6
1
2
3
4
5
5

Name                Value
----                -
Occupation           Developer
Name                 John Doe
Age                  30
True                 True
False                False

PS C:\Users\Administrator\Documents> _
```

**3**

## **Operadoreak eta kontrol-egiturak**

# Operadoreak eta kontrol-egiturak

- Eragiketa aritmetikoak
  - Batuketak, kenketak, biderketak eta zatiketak.

```
$a = 10  
$b = 20  
$c = 30  
$d = 40  
$sum = $a + $b  
$res = $b - $a  
$product = $a * $b  
$div = $b / $a
```



# Operadoreak eta kontrol-egiturak

- Array-ak kontrolatzen

```
$array = @(1,2,3,4,5)  
Write-Output $array.count # counting  
Write-Output $array[0] # indexing  
$array += 6 # add element  
Write-Output $array
```

**PowerShell-eko array-etan defektuz ezin dira elementuak ezabatu. Alternatiba bezala, beste array mota batzuk erabili behar dira. Guk klasean ez ditugu ikusiko.**

**Workaround bezala, beste array bat sortzea da, ezabatu nahi dugun elementua array berrian sartu gabe.**

# Operadoreak eta kontrol-egiturak

- **Baldintzazko adierazpenak (conditional statements)**

- Aldagaiak nolan konparatu
  - **-gt** (greater than)
  - **-lt** (less than)
  - **-ge** (greater than or equal)
  - **-le** (less than or equal)
  - **-eq** (equal)
  - **-ne** (not equal)

- if, else, elseif

```
if ($a -eq $b) {  
    Write-Output "$a is equal to $b"  
} elseif ($a -lt $b) {  
    Write-Output "$a is less than $b"  
} elseif ($a -ge $b) {  
    Write-Output "$a is greater than or equal to $b"  
} else {  
    Write-Output "Error!"  
}
```

# Operadoreak eta kontrol-egiturak

- **Baldintzazko adierazpenak (conditional statements)**
  - Konparaketak konkatzen (and, or)
    - -and
    - -or

```
if ($a -eq $b -and $c -eq $d) {  
}  
  
if ($a -eq $b -or $c -eq $d) {  
}
```

# Operadoreak eta kontrol-egiturak

- **Looping**
  - Simple for loop

```
for ($i = 0; $i -lt 10; $i++) {  
    # Code to execute in each iteration  
    Write-Host "Iteration number: $i"  
}
```

- Looping through an array

```
$numbers = @(1, 5, 3, 8)  
foreach ($number in $numbers) {  
    # Code to execute for each item in the collection  
    Write-Host "Current number: $number"  
}
```

# Operadoreak eta kontrol-egiturak

- Looping
  - while

```
$counter = 0
while ($counter -lt 5) {
    # Code to execute as long as the condition is true
    Write-Host "Counter value: $counter"
    $counter++
}
```

- do-while

```
$number = 10
do {
    # Code to execute at least once, then repeatedly as long as the condition is true
    Write-Host "Number value: $number"
    $number--
} while ($number -gt 0)
```

4

## **Funtzioak eta cmdlets**

# Funtzioak eta cmdlets

- **Funtzio edo cmdlet batek hainbat zati ditu:**
  - Funtzioaren definizioa “function” eta izena.
  - Sarrera parametroak eta beraien mota eta izena.
  - Funtzioak exekutatuko duen kodigoa.
  - Return (beharrezkoa bada bakarrik).

```
function Print-Text {  
    param (  
        [string]$text  
    )  
    Write-Output $text  
}  
Print-Text -text "Hello, World!"
```

```
function Print-Text {  
    param (  
        [string]$text  
    )  
  
    Write-Output $text  
    return $text  
}  
$result = Print-Text -text "Hello, World!"  
Write-Output $result
```

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