

Installing JDK software:

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- 1) Go to google.com -> search JDK latest version download
- 2) Click Java Downloads
- 3) Click Windows
- 4) Click the exe file link
- 5) After downloaded, Click on the downloaded exe file
- 6) Click Yes -> Click Next -> Click Change button
-> remove "\program files\Java" and make
installation path as "C:\jdk-20"
- 7) Click Next -> Click Close

*** jdk-20 is installed in the folder C:\jdk-20

*** this jdk-20 is called JAVA_HOME

Different types of files exist in a software

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When we install any software we will get two types of files

- 1) binary files
- 2) library files

- binary file is a command file using which we can run the current software
and also we can run other programs those are developed by using this software.
- library file is a program file it contains logic to perform one operation
and by using it we can develop our own programs.
- The library files are also called as API(Application Programming Interface)
- by default binary files are stored in "bin" folder
- by default library files are stored in "lib" folder

Some times we need to access and run a software binary files and library files
from outside of this software installed directory from other folders from "command prompt"

Ofcourse we can not access them by default, because command prompt software does not
know

the path where those binary and library files are available in this system

We must tell to OS/cmd prompt the path of binary and library files.

For this purpose we must create some variables inside OS
for finding a software installed directory, its binary files and library files
those variables are technically called environment variables.

About environment variables

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A variable that is created inside OS for finding
a Software installed directory, its binary files and library files is called env variable.

For Java software we have 4 env variables

- 1) JAVA_HOME
- 2) path
- 3) classpath
- 4) module-path

- JAVA_HOME is used for finding JDK software installed directory
- path is used for finding ANY software binary files
- classpath is used for finding library files of JDK software, our project and Java related other softwares classes
- module-path is used for finding modules of JDK software, our project and Java related other softwares modules

Note:

- 1) JAVA_HOME, classpath and module-path are specific to Java software
where as path is common to all softwares we are installing in the system, including OS

Who will use above environment variables?

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- JAVA_HOME is set by programmer and it is used by server software (ex: tomcat)
- *** path is set by programmer and it is used by command prompt software for finding javac and java tools ***
- classpath and module-path are used by compiler and JVM for finding the classes and modules those available in other directories

Which environment variable is mandatory to set?

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- As of now we must set "path" variable, it is mandatory
because we need to access "javac and java" commands
from our project directory
- We not need to set JAVA_HOME, classpath and module-path, they are optional.

Note: From Java-13v onwards we no need to set path also :)))
JDK software will set path with jdk\bin path at the time of installation automatically.

Problem with default setting: we can access only javac and java tools
other jdk tools javap, javadoc, jar, ... can not be accessed.

For accessing all binary files of JDK software we have set path
in the below two ways

Diff ways of Setting env variables

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We can set env variables in two ways

- 1) temporarily (at command prompt window)
- 2) permanently (in system environment variables window)

Temporary settings

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- 1) Open cmd window
- 2) run below command

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>set path=C:\jdk-20\bin;-----;-----;-----;%path%
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(Donot show your typing talent, Copy and Paste path values)

Commands we use in setting env var temporarity

- 1) set -> creating and updating env variable
- 2) ; -> separating one software path to

another s/w path

- 3) %evn var% -> for retrieving existing value of this env var
- 4) echo %evn var% -> for printing this env variable value

The "set command" based setup is called temporary, because those setups are
available

only for this command prompt window. Once this command prompt window is
closed

all setups are lost. we must do same setups repeateadly every time when new
cmd window opened

Solution: permanent setup

Permanent setups:

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- 1) Right Click on "This PC"
- 2) Click "Properties"
- 3) Click "Advanced System Settings"
- 4) Click "Envinorment Variables"

5) In System Variables section

- 1) Double click "path"
- 2) Click "New" button
- 3) Click browse -> double Click -> This PC -> C -> jdk-20 -> bin
- 4) Click "Move Up" and bring "Java path" as first path
- 5) Click "Ok"
- 6) Close all windows

Rule: JDK path must be always first in path variable value because other software(ex: Oracle) also contains inbuilt JDK
If we place our JDK path at end in path variable value, our JDK will not be used in compiling and executing our class.

OS searching algorithm for finding binary files

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CWD --> if not available -> Path variable ->

First Come First Load (FCFL) (Left --> Right Searching in path variable)

Q1) In one computer how many JDK softwares can we install?

Multiple JDK of diff versions

Q2) If we install multiple diff versions of JDK from which version JDK javac and java will run?

CWD or First placed JDK in path variable
(Current Working Directory)

Q3) How can we run Java program with different versions?

- set one JDK path in permanent path, which you want to use always
- set another JDK path in temporary setting in cmd window which you use for one

time

Q4) If there are two JDK paths are stored in path variable, which JDK will be used?

- First placed JDK

Q5) In path variable, I have placed jdk-14 version path,
and in cmd window, I have changed path (CWD) to jdk1.7,
then which version javac will be used?

- 1.7 version will be used (first priority to CWD)

Q6) Can we set multiple JDKs in Permanent Path?

- Yes, but no use, because it follows FCFL
- If we place multiple JDKs in PP no problem but only first placed JDK is used.

Q7) We never to set path for game software to run,
why do we need to set path for JDK to run?

- We no need to set path for game software,
because we do not run game software binary files from cmd window
- We must set path for JDK,
because we need to run javac and java from cmd window from our
project directory

Q8) Summary: When, we must set path for any software?

- if we need to access any software binary files
from cmd prompt window from outside of software installed directory
we must set path.
- If we no need to access a software binary files from cmd window
from other directories, we no need to set path

Q9) Can we run javac and java like game software?

- not possible because they are not GUI based programs
- they are CUI based programs, they must be executed only from cmd prompt

window

- GUI means Graphical User Interface, a separate window will open
- CUI means Console User Interface, a separate window will not there
to run it needs console to run means cmd window

Q10) If we develop programs by using IDEs (Eclipse, MyEclipse, Netbeans, IntelliJ, JBuilder, etc...)

do we need to set path, classpath?

- No, not require
- IDE will take care of all required setup

IDE -> Integrated Development Environment

It is editor software, which has advanced features
for fast development