

# 智能算法与应用

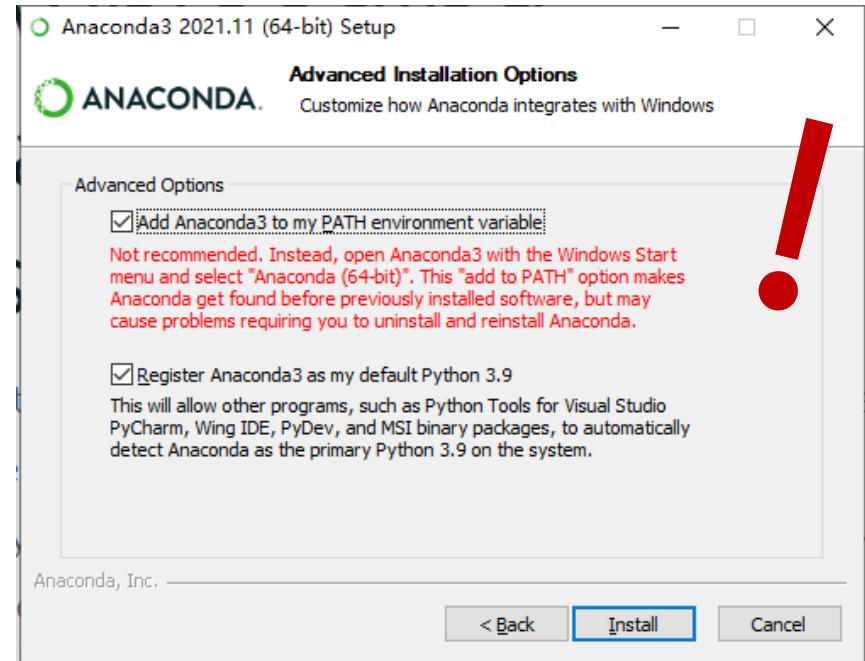
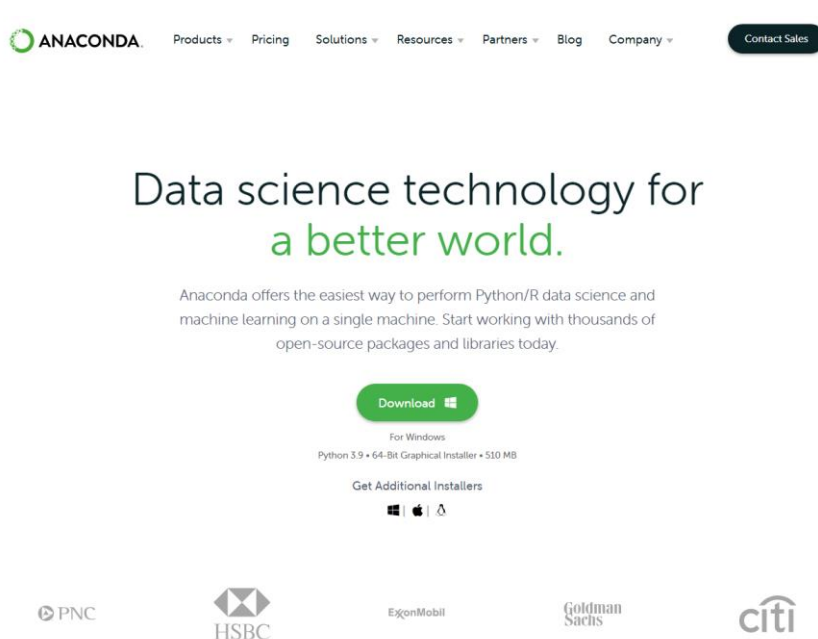
## ——实验

# 实验目标：

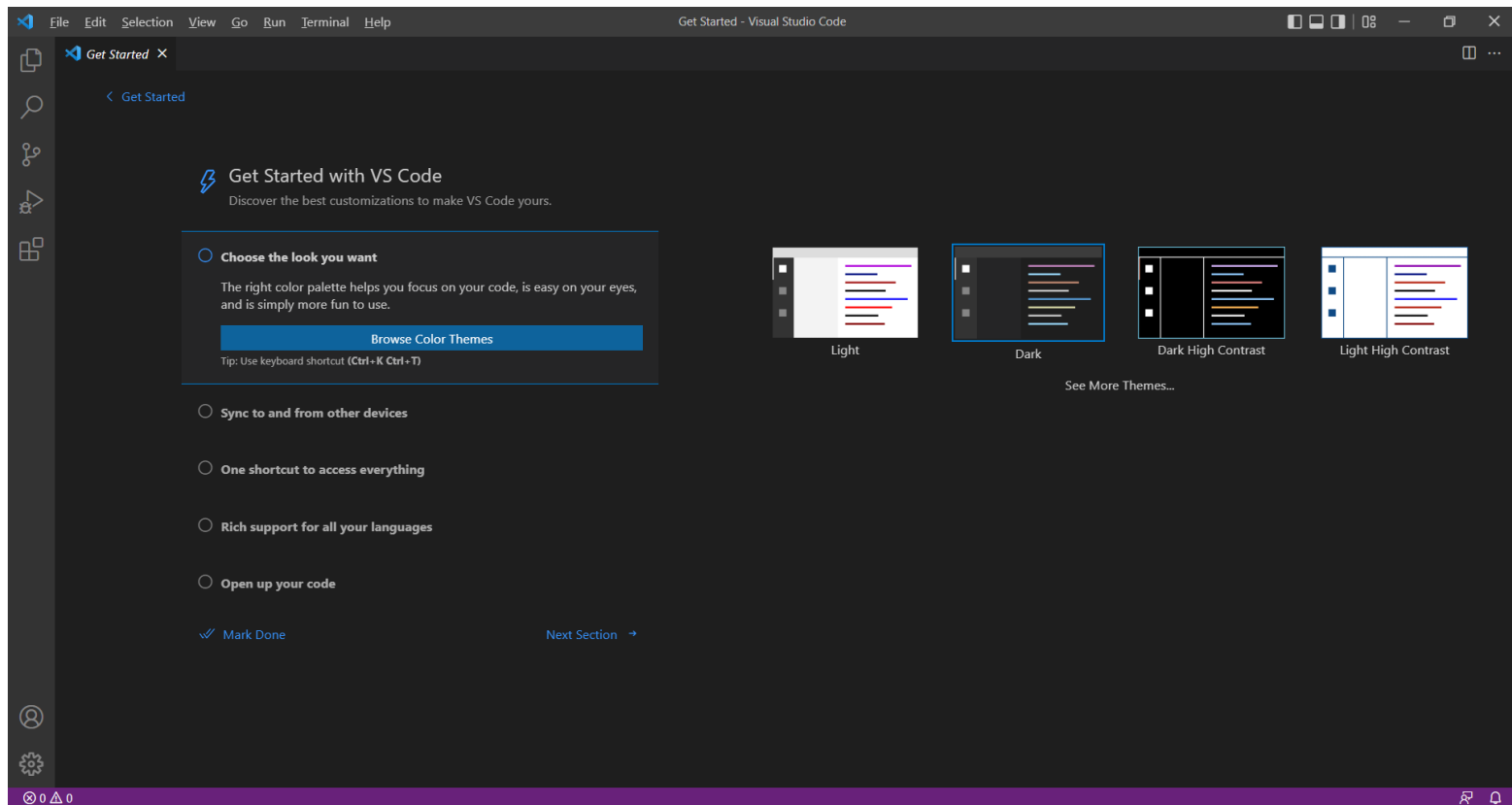
- 掌握pytorch等深度学习框架的环境搭建
- 掌握图像分类任务的训练和测试流程

# 软件安装

- 1. 下载并安装Anaconda3
- [Anaconda | The World's Most Popular Data Science Platform](#)

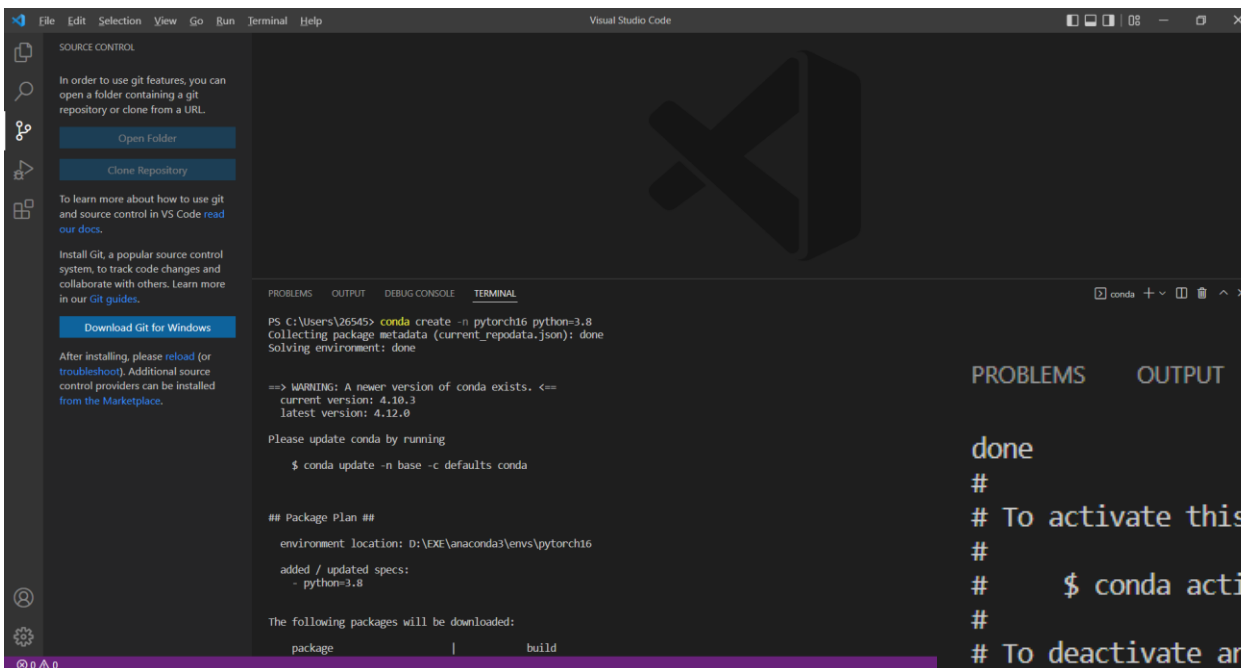


- 2. 安装Vscode
- [Download Visual Studio Code - Mac, Linux, Windows](#)



# 搭建环境

- `conda create -n pytorch16 python=3.8`
- `conda activate pytorch16`



The screenshot shows the Visual Studio Code interface. On the left is the Source Control panel with instructions on how to use Git. The main editor area displays the output of the terminal. The terminal shows the execution of the command `conda create -n pytorch16 python=3.8`. The output indicates that the environment is being solved and a warning is shown about a newer version of conda (4.12.0) existing compared to the current version (4.10.3). It then provides instructions on how to update conda and shows the package plan for the new environment, including the location and the added/updated specifications for python=3.8.

```
PS C:\Users\26545> conda create -n pytorch16 python=3.8
collecting package metadata (current_repodata.json): done
Solving environment: done

==> WARNING: A newer version of conda exists. <==
  current version: 4.10.3
  latest version: 4.12.0

Please update conda by running

    $ conda update -n base -c defaults conda

## Package Plan ##

  environment location: D:\EXE\anaconda3\envs\pytorch16
  added / updated specs:
    - python=3.8

The following packages will be downloaded:

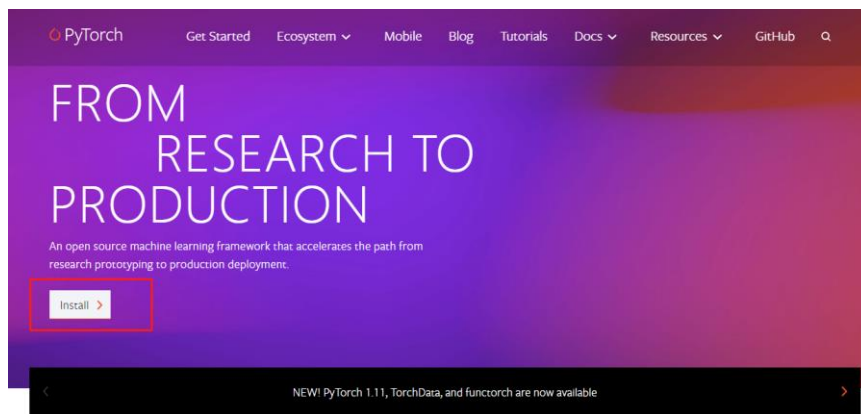
  package                   | build
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

```
done
#
# To activate this environment, use
#
#     $ conda activate pytorch16
#
# To deactivate an active environment, use
#
#     $ conda deactivate

PS C:\Users\26545> conda activate pytorch16
PS C:\Users\26545> 
```

- 安装pytorch (<https://pytorch.org/>)
- pip3 install torch torchvision



## KEY FEATURES & CAPABILITIES

### Production Ready

Transition seamlessly between eager and graph modes with TorchScript, and accelerate the path to production with TorchServe.

### Distributed Training

Scalable distributed training and performance optimization in research and production is enabled by the torch.distributed backend.

### Robust Ecosystem

A rich ecosystem of tools and libraries extends PyTorch and supports development in computer vision, NLP and more.

### Cloud Support

PyTorch is well supported on major cloud platforms, providing frictionless development and easy scaling.

[See all Features >](#)

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## START LOCALLY

Select your preferences and run the install command. Stable represents the most currently tested and supported version of PyTorch. This should be suitable for many users. Preview is available if you want the latest, not fully tested and supported, 1.12 builds that are generated nightly. Please ensure that you have **met the prerequisites below (e.g., numpy)**, depending on your package manager. Anaconda is our recommended package manager since it installs all dependencies. You can also [install previous versions of PyTorch](#). Note that LibTorch is only available for C++.

Additional support or warranty for some PyTorch Stable and LTS binaries are available through the [PyTorch Enterprise Support Program](#).

PyTorch Build	Stable (1.11.0)		Preview (Nightly)	LTS (1.8.2)
Your OS	Linux		Mac	Windows
Package	Conda	Pip	LibTorch	Source
Language	Python		C++ / Java	
Compute Platform	CUDA 10.2	CUDA 11.3	ROCm 4.5.2 (beta)	CPU
Run this Command:	pip3 install torch torchvision torchaudio			

# 图像分类任务

- 完成MINIST数据集图像分类
- 加分tips：学习率自适应调整、代码注释等

```
PS D:\code\image clacification> python .\train_MINIST.py
Epoch: 0 Train_Loss: 0.31864601245323815 Train_Acc: 0.8939666666666667 Test_Acc: 0.9721
Epoch: 1 Train_Loss: 0.07482444777290026 Train_Acc: 0.9766666666666667 Test_Acc: 0.982
Epoch: 2 Train_Loss: 0.05210557825565338 Train_Acc: 0.9837 Test_Acc: 0.9853
Epoch: 3 Train_Loss: 0.044828504725794 Train_Acc: 0.9854666666666667 Test_Acc: 0.9854
Epoch: 4 Train_Loss: 0.036615774647394815 Train_Acc: 0.9883833333333333 Test_Acc: 0.9842
Epoch: 5 Train_Loss: 0.03483209688824912 Train_Acc: 0.9890166666666667 Test_Acc: 0.9876
Traceback (most recent call last):
```

# 评分标准

- 提交code和实验报告，ddl和提交形式会在群里通知
- 完成课程目标即可获得80分基础分，鼓励创新和更高的准确率，同时也鼓励大家在群里答疑，也会酌情给予加分
- 杜绝抄袭，一经发现按学校规章处理，雷同作业成绩均记为0分